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*Small Is Beautiful,
But ...*



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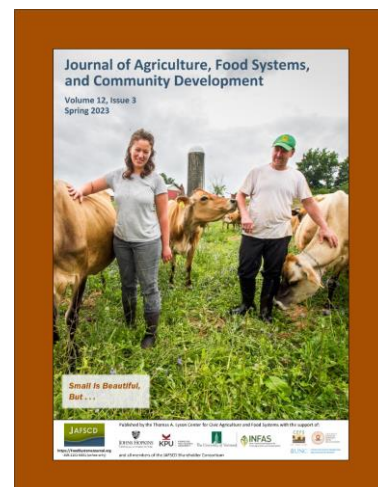
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*Photo by Joan Lentini**



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IN THIS ISSUE DUNCAN HILCHEY

Small is beautiful, but ...



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On the cover of our spring 2023 issue (volume 12, issue 3), Samantha and Chris Kemnah enjoy a moment with their cows on Clover Bliss Farm, their 190-acre farm in South Argyle, New York. You can read more about the Kemnahs in a 2018 article in the *Hill Country Observer* by Tracy Frisch entitled “An escape route from dairy farming’s crisis?”

Alas, the economic pressure Frisch referred to five years ago has remained for small dairy farmers—and particularly for small organic dairy farms. Since that article was written, the consumption of fluid milk has continued to decline even as organic milk has flooded into the limited market. In 2021, Danone North America (owner of the Horizon Milk brand) cancelled contracts with dozens of small organic dairy farms in the Northeast U.S., triggering an economic crisis and calling into question Danone’s certified B Corporation status. Observers have wondered, how could a company that promotes itself as farm-friendly not offer a more engaging and deliberative process in making such a consequential business decision?

But this case triggers an even larger question: while small may be beautiful, can small and middle-scale also be resilient, even in a triple bottom-line context?

Since E. F. Schumacher wrote *Small is Beautiful: A Study of Economics As If People Mattered* (1973, Harper-Collins), small, local food production has been promoted as an antidote to the caustic industrialization of

On our cover: Samantha and Chris Kemnah enjoy a moment with their cows on Clover Bliss Farm, their 190-acre farm in South Argyle, New York.

Photo by Joan Lentini

Joan Lentini is an award-winning photojournalist and high-end portrait photographer whose work has been published nationally and internationally. Contact Joan at <https://www.jklentini.com/>

agriculture, which—following the “natural” evolution within a capitalist system—leads to the survival of just the fittest (the most economically efficient, regardless of the side effects).

So, just how fit is our alternative? Can it survive, let alone thrive? Can our food system research, policy, and practice lead to the groundswell of public support to make the sea change required? More specifically, is the expedited adoption of a hybrid Western/Indigenous food system the answer to our growing social and ecological challenges—and can we adapt it in time?

In this open call issue, our authors address these questions through the eyes of small and beginning farmers who are navigating a VUCA world—a world that simultaneously volatile, uncertain, complex, and ambiguous.

We begin this issue with another thoughtful column by **John Ikerd**, who cautions us that “*Voting with your food dollars is not enough*.” He makes a very convincing argument that the collective we must go beyond the simplistic personal act of buying local and organic. We need to push hard on policies that hurt people and the environment, and to enact more resilient alternative in order to make a difference in a system that is so egregiously stacked against us.

In this issue’s open-call papers, JAFSCD scholars and collaborating practitioners give us a peek into the SWOTs of our intrepid small farmers and related food system initiatives. We get a glimpse into a wide range of challenges, but also of what we need to do to move the needle in this VUCA world—a world fraught with inequality, pandemics, environmental degradation, war, climate change, and other ongoing disasters.

We open our spring issue with *Diversification strategies for the resilience of small New England dairies*. Authors **Julie Snorek**, **Wyatt Cummings**, **Eric Hryniewicz**, **Keelia Stevens**, and **Rose Iannuzzi** explore how diversification may help small and family farms fare better during market shocks.

Next, **Keri Iles**, **Rebecca Nixon**, **Zhao Ma**, **Kevin Gibson**, and **Tamara Benjamin** find that beginning farmers are experiencing challenges such as labor shortages, difficulties in balancing on and off farm occupations, and establishing profitable marketing strategies, and that local resources organizations can do a better job of outreach and engagement to address these problems, in *The motivations, challenges and needs of small- and medium-scale beginning farmers in the midwestern United States*.

In their mixed-methods study, “*The farm has an insatiable appetite*”: *A food justice approach to understanding beginning farmer stress*, **Fiona C. Doherty**, **Rachel E. Tayse**, **Michelle L. Kaiser**, and **Smitha Rao** report high levels of mental health challenges among new, nontraditional farmers and what programmatic responses are critical to address these issues.

Sarah Rotz, **Adrianne Lickers Xavier**, and **Tabitha Robin** then explore the low level of Indigenous stakeholder engagement in the agri-food public sector, and citing “settler” lack of knowledge as a significant barrier to progress in fostering Indigenous food systems in “*It wasn’t built for us*”: *The possibility of Indigenous food sovereignty in settler colonial food bureaucracies*.

Continuing the exploration of small farms through an equity lens is *Surveying queer farmers: How heteropatriarchy affects farm viability and farmer wellbeing in U.S. agriculture* by **Michaela Hoffmeyer**, **Jaclyn Wypler**, and **Isaac Sohn Leslie**, in which the authors document systemic oppression in a population of queer farmers and identify strategies for addressing this complex issue, including support from LGBTQIA+ farm mentors or peers.

But small farmers are not the only stakeholders in our food system who are affected by our VUCA world. In *Experiences of structural violence and wage theft among immigrant workers in the California cannabis industry*, **Stella Beckman**, **Xóchitl Castañeda**, **Vania del Rivero**, **Anaisabel Chavez**, and **Marc B. Schenker** put the spotlight on a unique subset of our agricultural labor force who toil in an isolated and criminalized industry.

Potential solutions to our growing food system problems can come from nontraditional sources of wisdom. In *Indigenous food systems and food sovereignty: A collaborative conversation from the American Association of Geographers 2022 Annual Meeting*, **Suzanne Brant, Keith Williams, Jesse Andrews, Colleen Hammelman, and Charles Z. Levkoe** put a spotlight on the different knowledge ways of Indigenous and settler scholarship and identify the need for more respectful collaborations going forward in order to address all human and more-than-human needs.

Colleges and universities offer one of the best laboratories for food system study of course. In *Food systems change and the alternative campus foodscape* by **Michael Classens, Kaitlyn Adam, and Sophia Srebot** proffers the concept of the “campus food system alternatives” (CFSAs) that provides more clear governance, leadership, principles, and socio-ecological commitments than most current campus food systems.

Even schoolchildren can play a critical role in expanding family farming knowledge, as documented in *Assessing the impact of parental involvement on scaling agricultural technologies from school garden to home farm in Cambodia* by **Gracie Pekarcik, David Ader, Tom Gill, and Jennifer Richards**.

And the role of local market infrastructure in a VUCA world? In *COVID-19 and Pennsylvania farmers: Financial impacts, relief programs, and resiliency strategies during the 2020 growing season*, in which authors **Christopher D. Murakami, Miriam Seidel, Chia-Lin Tsai, and Jasmine D. Pope** discover the critical role direct markets play during a pandemic—to the benefit of not only farmers, but also local residents.

On the consumption side of the food system, we have two additional papers in this issue focusing on food insecurity in the COVID-19 era. In *Food insecurity among households with children during the early months of the COVID-19 pandemic*, **Bailey Houghtaling, Lindsey Haynes-Maslow, Lauri Andress, Annie Hardison-Moody, Michelle Grocke-Dewey, Denise Holston, Megan M. Patton-Lopez, Nila Pradhananga, T. Elaine Prewitt, Justin D. Shanks, Eliza Webber, and Carmen Byker Shanks** develop a demographic profile using a five-state sample of households most likely to have experienced food insecurity.

Finally, **Cody Gusto, John M. Diaz, Laura A. Warner, Christine Overdevest, Catherine Campbell, and Sebastian Galindo** use a Delphi process with a sample of nutrition educator to find potential new strategies for incentivizing the use of SNAP benefits during a crisis in *A snapshot of nutrition incentive adaptation during COVID-19: Consensus-building with practitioners*.

To wrap up the issue we also offer three book reviews. **Emily Nink** reviews *Milked: How an American Crisis Brought Together Midwestern Dairy Farmers and Mexican Workers*, by Ruth Conniff. **Philip H. Howard** reviews *The Agricultural Dilemma: How Not to Feed the World*, by Glenn Davis Stone, and **Amos Strömberg** reviews *The Immaculate Conception of Data: Agribusiness, Activists, and Their Shared Politics of the Future*, by Kelly Bronson.

Thus, we come full circle in this issue. We began with how small farms are struggling and coping in a VUCA world and how researchers and practitioners can rally to support them. These articles give us a ray of hope. However, local, state, national, continental, or global food policy should take better advantage of important contributions that nonindustrial family farms of all scales make to resilient food systems, in both good times and bad. For example, farmers, local and regional food producers and distributors, farmers markets, home and community gardeners, congregate meal providers, and food banks and pantries can be incentivized to cluster into “circular food systems” that are coordinated and act in harmony, particularly in times of crisis. Furthermore, establishing “food system circuit breakers” that automatically trip when a municipality, region, or country experiences elevated food insecurity must be a priority. As John Ikerd reminds us, voting with your food dollars is not enough. The global food movement must rally to push an

applied research, policy, and practice agenda that leads to immediate actions and longer-term systems change—even if it's initially nominal and incremental.

It might sound cliché, but the clock is ticking, time really is running out, and there is much to do. Let's all put our shoulders to the wheel in whatever way we can.



Peace, health, and happiness to all,

A handwritten signature in dark ink that reads "Duncan Hilchey".

Duncan Hilchey

Publisher and editor in chief



THE ECONOMIC PAMPHLETEER JOHN IKERD

Voting with your food dollars is not enough!

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It is often suggested that we vote with our dollars if we want to change the food system. A dollar spent is a vote for whatever we buy and a dollar not spent is a vote against whatever we don't buy. Consumers are led to believe that the current food system exists only because they have voted for it with their dollars. They are told to boycott foods, agribusinesses, and production systems that don't align with their social or ethical values.

Those who have discretionary dollars to spend should vote with their dollars. Food producers

respond to things that affect their bottom line. However, consumers haven't gotten, and won't get, the foods they need, or even want, by simply voting with their dollars. The "invisible hand" of economic theory just doesn't work very well in today's agri-food economy (Majaski, 2023). The current industrial food system doesn't have the capacity to translate consumers' food purchases into incentives for producers to provide the foods that consumers need or would even prefer.

Four basic conditions are essential to ensure

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*Why an **Economic Pamphleteer**? In his historic pamphlet Common Sense, written in 1775–1776, Thomas Paine wrote of the necessity of people to form governments to moderate their individual self-interest. In our government today, the pursuit of economic self-interest reigns supreme. Rural America has been recolonized, economically, by corporate industrial agriculture. I hope my "pamphlets" will help awaken Americans to a new revolution—to create a sustainable agri-food economy, revitalize rural communities, and reclaim our democracy. The collected Economic Pamphleteer columns (2010–2017) are at <https://bit.ly/ikerd-collection>*

that markets respond to the needs and preferences of consumers rather than create unnecessary profits for food producers. First, there must be enough producers and sellers of each basic food item so that no individual producer or seller can either sell at any price higher or needs to accept any price lower than the overall market price. This means that no seller will be able to retain excess profits. Prices paid by consumers at the retail level will then be passed down through the various levels in the marketing system and will be accurately reflected in prices paid to producers at the farm level.

Second, producers who can provide food items that better meet consumers' needs and preferences than those currently available must be able to gain access to retail food markets. This means that new producers have opportunities to develop and market products that respond to existing and changing consumer needs and preferences, not only regarding the characteristics of foods but also the characteristics of the farms and food systems that produce them.

Third, consumers must have accurate information, prior to purchase decisions, regarding the nutritional value and overall benefits or satisfaction they will realize from their food choices. This allows consumers to choose products that reflect their needs and preferences, rather than spend money on foods that fail to meet their expectations.

And fourth, consumers must be free to make food choices without coercion, persuasion, or mental manipulation. This allows consumers to make food choices that reflect their actual needs and preferences, rather than choices that reflect psychological needs and preferences that have been created or influenced by food processors and retailers. Consumer sovereignty is a foundational principle of economic theory.

These conditions are not controversial among economists. The conditions need not be met *per-*

fectly for markets to function effectively, but there is no logical reason to believe that markets lacking these basic characteristics will respond to consumers' needs and preferences. Today's industrial food systems do not possess the fundamental requirements of economically competitive markets as described above.

First, in today's food systems, there are no longer large numbers of sellers or buyers at any

level between farmers and consumers. "Concentration of ownership, wealth and power is particularly apparent in the agri-food system where just a few companies dominate almost all aspects of food production" (Hendrickson et al., 2020, p. 1). Even agricultural production has become increasingly consolidated among fewer, larger farming operations. "Consolidation and concentration are key features across the food system, from aggregating farmland holdings to seeds and fertilizers to processing and manufacturing to distributing and retailing"

(Hendrickson et al., 2020, p. 2). There is no logical reason to believe that the prices currently paid by food consumers are accurately reflected in the prices paid to farmers.

Second, it is extremely difficult, if not impossible, for producers of food products that do not fit today's large-scale industrial food system to gain access to mainstream consumers. For example, according to Edwards (2016), "'Slotting fees' (or 'slotting allowances') are fees that manufacturers pay retailers to appear on their scarce shelves. It can cost millions of dollars to launch a product in the nation's groceries, and through that cost, these fees shape our supermarkets and diets long before we're able to make a purchase decision ourselves" (para. 2). Consumers never get a chance to vote with their dollars for many of the food products that are more flavorful and nutritious and are produced by more ecologically and socially responsible means than the foods available in supermarkets today.

Consumers never get a chance to vote with their dollars for many food products that are more flavorful and nutritious and are produced by more ecologically and socially responsible means than foods in supermarkets today.

Third, consumers do not have adequate unbiased information about food products to make informed choices. The federal government mandates listing specific nutritional information on food labels, but the U.S. Department of Agriculture Economic Research Service (USDA ERS; 2022a) notes that “mandated labels can still be misleading; consumers may not fully understand label claims, and instead of improving societal outcomes, labels may increase inefficiency in the marketplace” (para 2). For example, food manufacturers may focus their advertising on one specific item—such as trans fats, cholesterol, or sugar—to hype the nutritional value of products that have other nutritional deficiencies or pose significant health risks. Many “junk foods” are also engineered to trigger pleasure responses in the brain that establish hard-to-break food habits or addictions (Lustig, 2020). Consumers are left unaware of the risks.

Fourth, consumers are subjected to a constant barrage of messages from multiple sources designed to shape, rather than respond to, their tastes and preferences. Food advertising alone accounts for about 3 cents of each dollar spent by food industries—which is comparable to that portion of the food dollar made up of energy (3.2 cents), transportation (3.6 cents), and packaging (2.9 cents) costs (USDA ERS, 2022b). Much of this advertising, as well as industry-sponsored “scientific” information, is targeted to manipulate the minds of consumers rather than simply promote the value of food products.

This manipulation is not limited to convincing consumers that junk foods are good for them, or at least not harmful. The mental manipulation begins in elementary schools with “educational” programs that promote the virtues of industrial agriculture. Advertising also exploits the vulnerabilities of children and insecurities of teenagers to pressure their parents into making unhealthy food choices. Decades of consumer “reeducation” programs have transformed the public perception of food preparation from a culinary art to be respected and ad-

mired into mindless drudgery to be dreaded and avoided. American consumers have been brainwashed into spending more money for food convenience than they spend for food nutrition.

As a result, supermarkets are filled with foods that maximize the profits of the corporations that dominate agri-food systems rather than meet the needs and preferences of consumers. Compelled by their priority for convenience, many consumers do all or most of their food shopping at the same supermarkets. The supermarkets price food items to maximize storewide profits. Some items are overpriced to increase profit margins while others are underpriced to increase store traffic, both of which distort economic incentives for farmers.

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Consumers never have a realistic chance to vote with their dollars for alternatives to industrial food products that can’t compete for shelf space. Perhaps most important, massive “education,” public relations, and advertising programs have left mainstream consumers unaware of the negative environmental, social, and public health impacts of their food choices.

A primary responsibility of the government is to maintain the economic competitiveness of markets. The U.S. government instead has sacrificed economic competitiveness to allow agri-food corporations to expand and consolidate to achieve the so-called economies of scale of large-scale production (Ikerd, 2023). However, once a small number of large producers are allowed to dominate a market, there is no means of ensuring the essential conditions for economic competitiveness. In the absence of large numbers of small producers, there is no way of knowing whether consumers have benefitted from the supposedly lower costs of large-scale production. Given an opportunity to compete in economically competitive markets, sustainable foods and farming systems might have displaced industrial agri-food systems decades ago. There is no way of knowing.

While it’s important to vote with our dollars, it’s also important to vote for the government poli-

cies that will give us a chance to vote for the food we want. Legislation has been introduced in Congress that would help restore competition in the agri-food industry and help producers of non-industrial foods gain access to markets (Farm System Reform Act of 2023). Generous government subsidies and regulatory exemptions also have given industrial agricultural producers major nonmarket advantages over their competitors. In

addition, the people who have the greatest need for food don't have enough money to get the food they need by voting with their dollars, even if markets were economically competitive. Admittedly, the current agri-food system exists because consumers have failed to reject it, but they have had little chance to vote with their dollars for food systems that would actually meet their needs and preferences.

References

- Edwards, P. (2016, November 22). The hidden war over grocery shelf space. *Vox*.
<https://www.vox.com/2016/11/22/13707022/grocery-store-slotting-fees-slotting-allowances>
- Farm System Reform Act of 2023, S. 271, 118th Cong. (2023).
<https://www.congress.gov/bill/118th-congress/senate-bill/271?s=1&r=60>
- Hendrickson, M. K., Howard, P. H., Miller, E. M., & Constance, D. H. (2020). *The food system: Concentration and its impacts*. Family Farm Action Alliance. <https://farmaction.us/concentrationreport/>
- Ikerd, J. (2023). The Economic Pamphleteer: Economies of scale in food production. *Journal of Agriculture, Food Systems, and Community Development*, 12(2), 155–158. <https://doi.org/10.5304/jafscd.2023.122.002>
- Lustig, R. H. (2020, November). Ultraprocessed food: Addictive, toxic, and ready for regulation. *Nutrients*, 12(11), Article 3401. <https://doi.org/10.3390/nu12113401>
- Majaski, C. (2023, January 1; updated March 21). What is the invisible hand in economics? *Investopedia*.
<https://www.investopedia.com/terms/i/invisiblehand.asp>
- U.S. Department of Agriculture Economic Research Service [USDA ERS]. (2022a, February 4). *Food labeling*.
<https://www.ers.usda.gov/topics/food-choices-health/consumer-information-and-labeling/food-labeling/>
- USDA ERS. (2022b, November 17). *Food dollar series: Documentation*.
<https://www.ers.usda.gov/data-products/food-dollar-series/documentation.aspx#>

Diversification strategies for the resilience of small New England dairies

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Abstract

Dairy farmers face persistent market shocks that force creative diversifications to enhance their resilience. In the summer of 2021, corporate dairy companies canceled over 100 contracts with organic dairy farmers in New England, a market

shock to the industry across the Northeast. To better understand how farmers cope with market shocks in small dairy production, we studied small-scale dairy farms from the perspective of social ecological resilience, exploring the role of diversification in small dairies in Vermont and New Hampshire: which strategies are most effective, what factors influence diversification, and the barriers to diversification. Data came from interviews with dairy farmers and advocates from multiple sectors involving ecological, economic, institutional, cultural, and personal domains. We highlight why, how, and with what support small-scale New England dairy farmers have adapted, supplemented, or transformed their dairy operations.

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Dairy farms exhibited high levels of diversification, motivated by a range of economic, ecological, and personal incentives. Predominant diversification pathways include (1) higher premiums from organic or directly marketed liquid milk, (2) value-added dairy products, (3) nondairy farm products, and (4) efficient and sustainable land management practices. Our findings suggest that what supports diversification is the transparent and open sharing of knowledge among a network of farmers, based on strong interpersonal relationships. Institutions such as government programs and dairy cooperatives frame diversification, which is best supported by funding flexibility and accessibility of information. Diversification has enabled greater resilience for dairy farmers, despite continued dairy market volatility in the Northeast. Without structural and institutional changes, dairy viability will continue to be in jeopardy, and the need for diversification will remain.

Keywords

Organic Dairy, Regenerative Agriculture, Soil Health, Social Networks, Land Stewardship, Cooperatives, Local Food Hubs, Vermont, New Hampshire, Qualitative

Introduction

Dairy consolidation, a process in which the number of dairies decreases while production demands increase, has intensified since the 1980s (MacDonald et al., 2020; Thornton, 2010; Yonkers et al., 1987). Prompted by low milk prices and high input costs, consolidation is increasing for both conventional and organic dairies (MacDonald et al., 2020). Amid these challenges, small dairy farmers are persisting. The ability to persist, or resilience, is a response to unpredictability—seasonality, climate changes, market shocks, shifting human preferences and political factors (Darnhofer, 2014; Folk et al., 2010; Snorek et al., 2017). It has been shown that diversification in dairy systems contributes to overall farm resilience (Darnhofer, 2014; Dumont et al., 2020; Sneysens et al., 2019). To understand what, why, and how dairy farmers persist amidst shocks, we explored one quality of resilience—diversification—as it is practiced in small dairies in the Northeast.

Context of the Case Study

In August 2021, Danone, the parent company of Horizon Organic, the largest provider of organic milk in North America, informed 89 Northeast dairy farmers that their contracts would be terminated the following August. What caused the decision was a shift in Danone's business model; accessing the many small (<100 cows) dairies in the Northeast required more costs in trucking and transportation than buying from large-scale dairies in the Midwest (Cutler, 2021; Gilman 2021). Due to significant pressure from Northeast farmers and advocacy groups, including some requesting that Danone stay in the region and construct a regional processing facility, Danone extended the canceled contracts for an extra six months and added a conciliatory transition payment (Maltby, 2021). Nevertheless, this market shock was exacerbated in early 2022, when another liquid milk buyer, Maple Hill Creamery, terminated 46 contracts with organic dairies.

Formed to respond to the multiple shocks, the Northeast Dairy Task Force sent recommendations to the U.S. Department of Agriculture (USDA) highlighting the many challenges to maintaining a viable Northeast dairy industry (Allbee, 2018; Held, 2021). They emphasized the imperative to finalize and immediately implement the "Origin of Livestock" rule (Ginsburg & Lundgren, 2021), which "provides clear and uniform standards about how and when livestock may be transitioned to organic dairy production, and how transitioned animals are managed within the organic dairy system" (USDA, 2022, para. 2), as well as the "Pasture Rule," which dictates the number of days an organic milk herd must be grazing on pasture. The political stalemate on how to implement and enforce these rules has been one of the factors that indirectly supported Danone's transition, as Midwestern and Western large-scale "mega" (>1000 cows) dairies may not be compliant with the organic rules. While the iconic small farms typical of the Northeast remain embedded in the imagination of Americans consuming milk, the situation in the Northeast may prove this image to be a thing of the past, as the system transitions from small dairies (10–199 cows) toward more reliance on "efficient" feedlot (>2,000 cows) production systems.

Due to these market shocks, and other challenges to the Northeast U.S. dairy system, we ask: What systems, policies, and diversification strategies have supported Northeast dairies? We frame our analysis in theories of social ecological resilience to persistent crises and highlight social and economic diversification that supports and buffers the dairy industry in the Northeast.

Literature Review

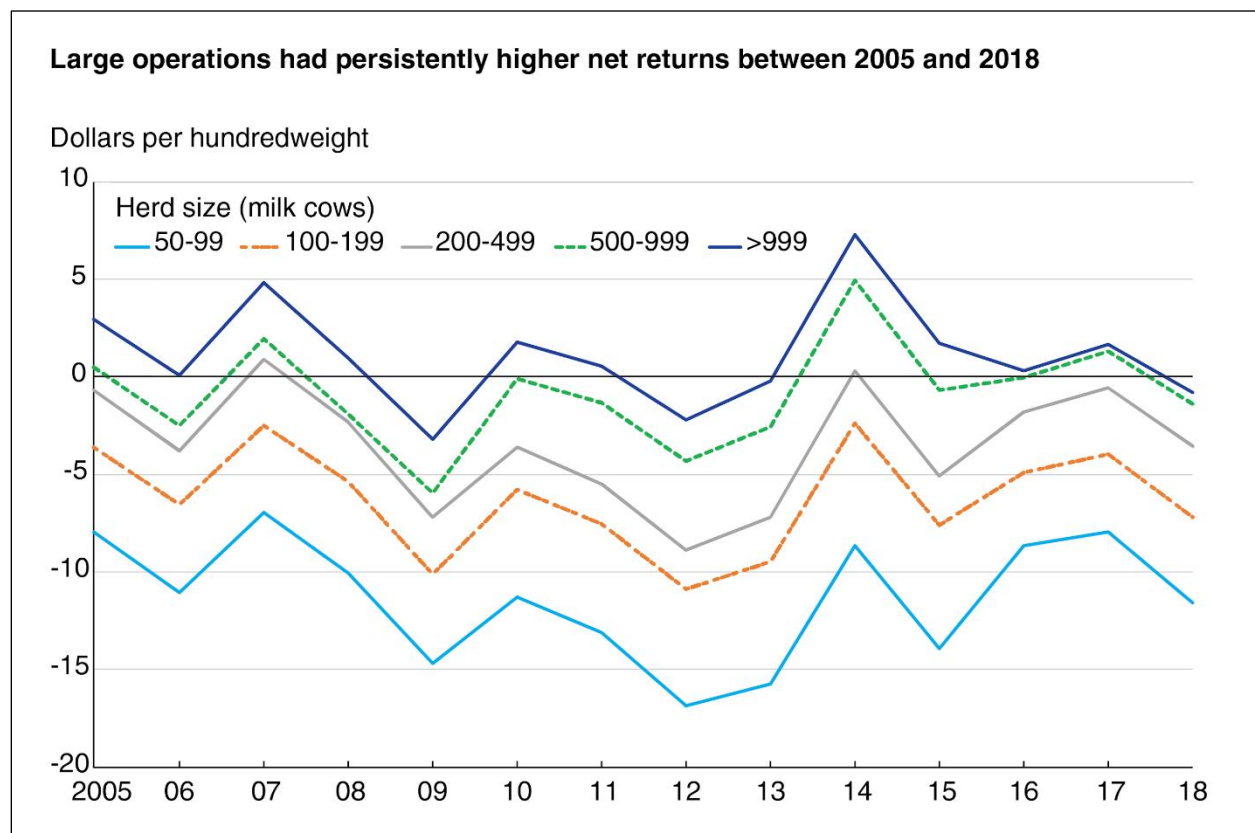
Resilience is the ability of a system to recover from, adapt to, and/or transform in the face of shocks and stresses (Folke et al., 2010). There is a dominant view that nature returns to a singular equilibrium state through self-repair after a stress or human impact (Folke, 2006). Resilience thinking challenges this by recognizing that the system itself has never been in a constant state of equilib-

rium, but rather of constant evolution and change (Folke, 2006; Walker, 2020). While conceptually resilience has faced broad critiques (Davidson, 2010), the concept serves as a starting point to understand how humans are coping, adapting and transforming in light of the interlinked challenges of climate and environmental change as well as market volatility (Snorek et al., 2014).

Large-scale dairy farmers produce milk more efficiently and cost-effectively (Figure 1), and thus are able to more easily rebound when the price of milk plummets, which is a financial advantage of large- over small- and mid-sized- farms (MacDonald et al., 2020).

Large systems that strive toward more efficiency and cost-effectiveness do so often by reducing redundancy and creating monocultures (Walker, 2020). In the context of dairy, this often results in

Figure 1. Returns of Large Dairy Operations (2005–2018)



Note: The USDA Economic Research Service (ERS) used comprehensive data from the USDA Agricultural Resource Management Survey to generate baseline estimates of costs and returns for 2005, 2010, and 2016. For other years, ERS relied on data on milk and input prices and milk production to extend baseline estimates.

Source: USDA ERS (YEARS??).

greater distance between producers and consumers due to long supply chains and centralized processing facilities (Wang et al., 2020). Yet, smaller, agro-ecological systems are often more resilient to stresses such as pandemics, pest outbreaks, natural hazards (Perrin & Martin, 2021), while larger and more efficient systems can fail (Gallopín, 2006; Walker 2020; Wang et al., 2020). Gallopín (2006) and Gupta (2010) identify redundancy, diversity, flexibility, room for autonomous change, and effective leadership as qualities of a system that build adaptive capacities and enhance resilience.

Case studies are emerging around the world that demonstrate how diversification beyond commodity production systems can increase economic and ecological resilience (Dumont et al., 2020; Liebman & Schulte, 2015), with relevant examples in Zambia (Chonabayashi et al., 2020), India (Birtchal & Hazrana, 2019), Brazil (Szymczak, 2020), and France (Perrin & Martin, 2021). In the dairy industry, transformation of the overall system (social, economic, ecological) is crucial to building resilience (Sinclair et al., 2014), especially in geographies not suited to large-scale agriculture, e.g., mountainous regions (Madelrieux et al., 2015).

The Northeast Dairy System

The dairy-centric Northeast agriculture economy is highly vulnerable to market shocks (Lin, 2011). Early settlers harvested timber and raised sheep, practices that swiftly transitioned to dairy in the 19th Century when Australian sheep took market precedence (National Park Service, 2000). In 1925, Vermont had one-third of all dairy cows in New England and produced 30% of the dairy products consumed in the region (Schoenfeld, 1927), shipped on the famous “milk trains” to city centers such as Boston and New York (Bezio, 2009; Schoenfeld, 1927). In contemporary Vermont, 80% of the land base, 60–70% of state revenue, and 85% of exports are derived from the dairy sector (Parsons, 2010); no other state is dominated by a single agricultural commodity (Wironen et al., 2018).

Liquid milk price is perhaps the greatest stress on farmers, especially since the 1980s (Parsons 2010). Until the 1982 Farm Bill (Sinclair, 1981), milk prices were set at 75–90% parity with produc-

tion costs, giving farmers a stable living wage and prompting surplus production. Parity was part of the New Deal, when the dairy sector was modernized, mechanized, and supported with federal price controls through the Agriculture Adjustment Act of 1933 and the Federal Milk Marketing Order of 1937 (USDA Farm Service Agency, 2004; U.S. General Accounting Office, 1988). These price controls were dismantled during the Reagan administration (Figure 2).

Dairy farm and co-op consolidation began in the 1990s. From 1995 to 2020, the number of operating dairy farms in America decreased by 74.1% (Walsh et al., 2020). Prices are controlled by the Federal Milk Marketing Order system, which prompts co-ops to offer restrictive contracts to farmers. The Dairy Margin Protections of 2014 (Figure 3) failed to support dairy producers because the margin was too low to compensate for price volatility, and price supports provide only a final defense to market collapses (Figure 2). For instance, 2–3% overproduction can lead to a milk price fall of 20–30% (Jeffords, 2010). As production costs have increased, the average price of milk has steadily decreased, leaving most farmers unable to survive without consolidation. The problem is compounded in the Northeast by its geography, which is not conducive to the scale of consolidation that would permit fair competition with large dairies in other regions.

Northeast dairies once could cope with price fluctuations by switching to organic milk production, which offered more stable premiums. But several events have caused even organic milk prices to fluctuate, such as White Wave being sold to Danone in 2017 (Reed & Weiss-Tisman, 2021; Walsh et al., 2020). As Midwest dairies have grown in size and numbers of cows (Figure 3), supply quickly outpaced demand and organic milk prices dropped (Cotton, 2021). These conditions have been exacerbated by the loosening of National Organic Program rules, permitting cost-cutting measures that impact the margins of compliant dairies (Parsons, 2010).

Farmers have always had to find solutions to unpredictable change, such as hailstorms that destroy crops, shifts in consumer interest that impact their markets, and diseases that unexpectedly infect

livestock. Climate change is prompting multiple and more frequent shocks, culminating in greater vulnerability to already challenged dairy farmers (Darnhofer & Strauss, 2014). In the face of low milk prices, the loss of organic markets to western farms, and other pressures on the Northeast dairy economy, we investigate how dairy farmers in Vermont and New Hampshire are building resilience, looking particularly at processes of diversification. This case study of Northeast dairies builds on existing knowledge of diversification and provides insights into how to build resilience in the global food system to multiple stressors that are amplified by climate change (International Panel on Climate Change, 2019; International Panel of Experts, 2016).

Research Methods

The research project began November 6, 2021, with a panel discussion at a farm in New Hamp-

shire, “Climate and market changes: What contributes to a resilient dairy system?” hosted by the Northeast Healthy Soils Network (NEHSN), a collaboration of farmers, advocates, government officials, researchers, and community members to establish healthy soils throughout the Northeast. Panelists consisted of several dairy farmers from New Hampshire and Vermont, an industry representative from the host farm, and a government representative of the dairy task force. We recorded, with note taking and audio recording, both panelist and audience comments. Afterward, several members of our research team held in-depth, semi-structured interviews with panelists, addressing our main research question—what diversification processes have built resilience on dairy farms in Vermont and New Hampshire in the face of consistent market shocks?

These initial interviews supported the development of a semi-structured interview guide that ad-

Figure 2. Timeline of Dairy Pricing Policy in the U.S.

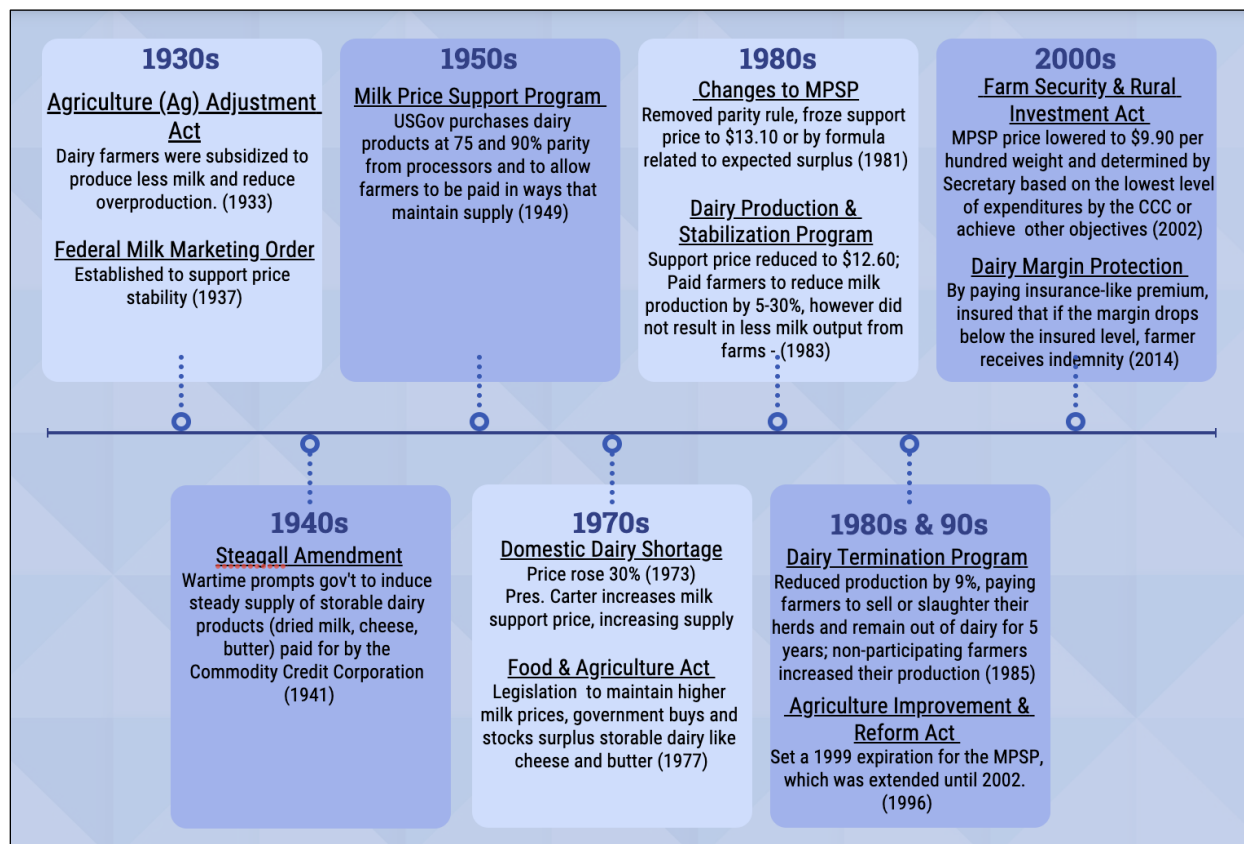


Image produced by author.

addressed what elements motivate diversification, how and why a specific strategy is chosen, and what socio-political elements support individual agency when diversifying dairy farms. These questions supported our objective to understand how, why, and with what support smallholder dairy farmers persist amidst uncertainty and frequent shocks. Our qualitative data collection followed the theories of Glaser and Strauss (1967), utilizing a grounded theory approach (a qualitative approach during which the researcher(s) iterates and proposes new theoretical concepts along the course of empirical research).

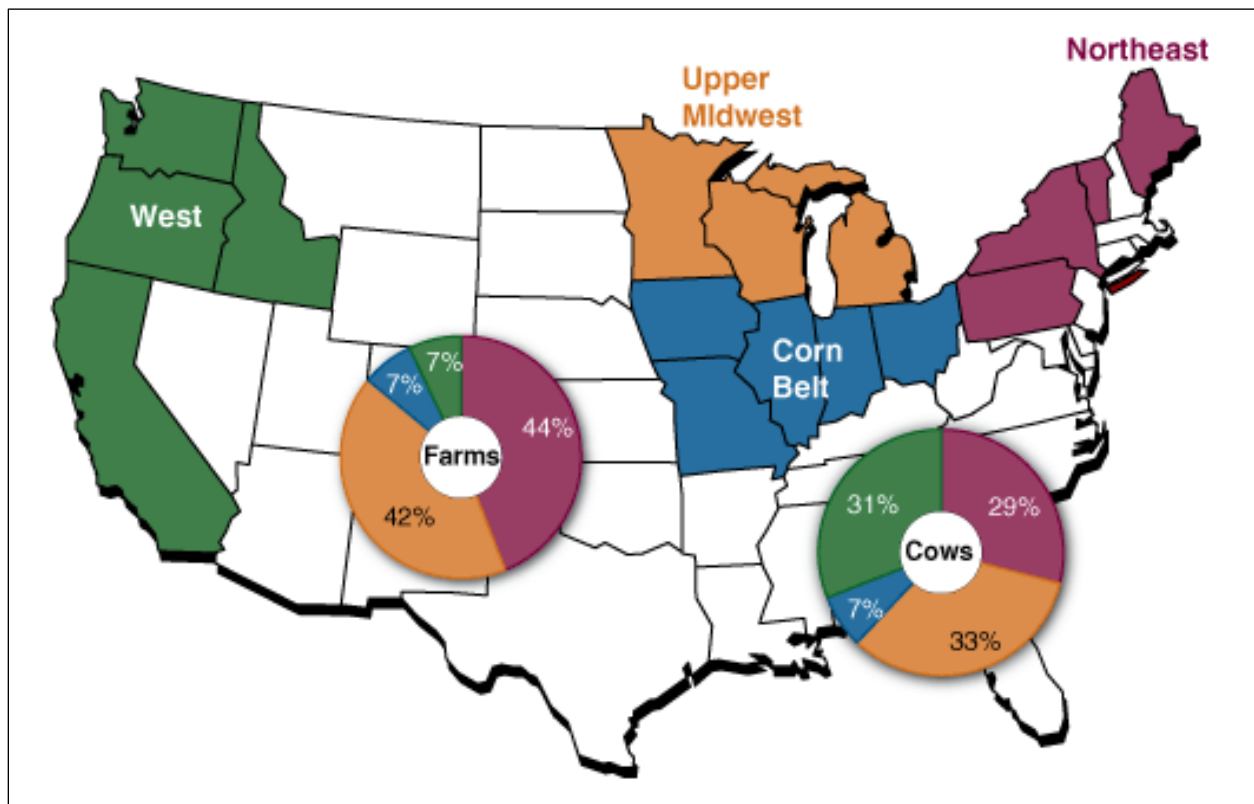
We interviewed 10 farmers, six organic and four conventional, and seven nonfarmer dairy advocates from government and nongovernmental organization) during the second week of November 2021, using a convenience and snowball-sampling process. Due to budget and time limitations,

we targeted dairy farmers located within 100 miles of Brattleboro, Vermont, where the study was based. To find institutional actors, we carried out a literature review and cold-contacted each individual. Respondents represented a diversity of farm types, owners, production systems, and demographics (Table 1). Interviews lasted 45–90 minutes and were carried out by a team of three (consisting of both male and female researchers) who contacted the respondent and sought his/her/their consent and engaged in a conversational and relaxed interview (either in-person or virtual) that was recorded through audio and handwritten notes, anonymized, and uploaded into otter.ai, a password-protected application for interview transcription.

A limitation of this study was that we did not have sufficient time to carry out an exhaustive data collection process. There is risk that the conven-

Figure 3. Share of Organic Dairy Farms and Cows by Region

During the 2005 livestock census, only 7% of organic dairy farms were located in the West region, but these farms held 31% of the cows. This trend has continued to increase.



Source: USDA, Economic Research Service. Calculations based on data from the USDA 2005 Agricultural Resource Management Survey.

ience sampling process introduced bias, but our selection was based on farm diversity (size, location, topography) of farms, which reduced bias. The information from farmers was triangulated with interviews with institutional representatives (farmer advocates and government representatives), and in our analysis the data appeared to express redundancy.

The data were analyzed using a basic qualitative coding process. Substantive themes were identified and analyzed through our team's collective discussion as to how the farmer employed strategies to build resilience. Thematic coding was employed to identify patterns and relationships, in order to develop generalizations as to how and why farmers are attempting to increase resilience of their operations through diversification.

Results and Discussion

Diversification for Resilience

Similar to the findings of MacDonald (2020), these Northeast dairy farmers do not perceive small-scale dairy production as economically feasible in the current system, which increasingly favors large-scale operations. As the costs of dairy inputs (e.g.,

hay and grain) increase and the price of liquid milk decreases, smaller-scale dairy farms are unable to make ends meet. One farmer stated that due to price hikes they spent an additional \$100,000 in 2021 on grain. Farmers repeated variations of the following remark when asked about the current predicament faced:

That's one of the tricky things...the cost of living is going up as well as the cost of inputs. As both are going up, and the price of the milk is not. And you need the same amount of labor. (Farmer of Farm G)

Due to the stagnancy of conventional and organic liquid milk prices and the high cost of inputs, farmers are looking to diversify. Dairy farming in itself was not seen as a viable livelihood by our respondents. Many dairy farmers rely on social services (e.g., SNAP benefits) or nonfarm supplementary income to maintain a quality of life that includes sending their children to college, having enough food, and maintaining their home as well as the farm.

Farmers diversify their products, practices, and marketing, each of which depends on the farmer's individual philosophy, personal constraints, geography, and the support of the community and institutions around them. These diversification strategies (Table 2) were categorized as: Livestock Care (practices involving the general physical and emotional care of the cows from pre-conception through death; e.g., nurse cows, calving cycles), Land Stewardship (practices geared toward increasing soil health and ecological resilience; e.g., rotational grazing, conservation easements), Feed Production (practices departing from the norm of purchasing commodity feed; e.g., onsite feed production), Dairy Processing/Energy Production (ways in which farmers are diverting their milk from wholesale buyers; e.g., onsite processing facilities), Farm Products (what is produced and sold through pathways other than wholesale milk buyers; e.g., raw milk, surplus hay, eggs, etc.), and/or Off-Farm Employment. Farm Products were divided into typologies: value-added dairy products, by-products, and nondairy products.

Table 1. Summary of Demographics of Interviewees

	Farmers	Dairy Advocates
All (total #)	10	7
Women (#)	5	3
Men (#)	5	4
Age (50+)	4	NA
Age (36-50)	4	NA
Age (20-35)	2	NA
Farm Size "Large"	1	NA
Farm Size "Medium"	0	NA
Farm "Small"	9	NA
Type of Interviewee		
Farm	10	NA
NGO	NA	2
Business	NA	2
Government	NA	3

Land stewardship, livestock care, and feed production

Many farmers consider themselves stewards of land, animals, and communities. When asked how Farmer A cares for the soil, they stated: “I see us more as land managers first, animal managers second, and food producers third.” These principles were often solidified by established conservation easements on their land—an “irrational” decision from the perspective of a classical capitalist economic vision, as it limits land uses to agricultural development. As shown in past studies, farmer motivation to practice stewardship is based more on multiple and subjective factors than pure economic reasoning (Carlisle, 2016).

Multiple strategies made stewardship financially viable. Farmers found that they could reduce external inputs (e.g., hay) by restoring the health of soil and land, aspects related to regenerative design and practice (LaCanne & Lundgren, 2018). Farmers earned premiums for their milk by changing their livestock care practices—diversifying their herd genetically or nutritionally to earn the premium for fat and protein percentages (one did so in order to support a local cheese producer). Another changed their grazing practices to earn the

premium for a grass-fed label, generally with the support of a dairy cooperative (Snider et al., 2022). Transitioning to organic fodder supported some farmers, earning an additional premium for certified organic hay. Five (C, F, G, H, J) of 10 farms grow as close to 100% of their feed as possible, which, in ecological terms, creates a closed-circuit input-output system that reduces hay input cost, transport emissions and regional nutrient extraction while incentivizing soil regeneration (Jones, 2008). Strategies that provide healthy on-site feed for livestock included managed intensive grazing and seeding plant biodiversity, measures that improve soil health, enhance livestock feed quality and reduce illness. A diversity of livestock species (e.g., cows and chickens) produce co-benefits and reduce the need for pesticides, as chickens eat the fly larvae in cow manure, reducing larval loads. To protect water quality, farmers repurpose their waste products (e.g., collecting whey from cheesemaking partners to feed pigs).

Farmer stewardship practices were predominantly concerned with soil health—building organic matter content, preventing erosion or compaction, increasing water infiltration and quality,

Table 2. Selected Types of Diversification Organized by Product-based Categories and Practicing Farms (# Used among the 10 Farms)

Diversification	Types identified
Livestock care	Improve nutrition (4), Calving practices (3), Selective breeding (2), Enhance shelter (2)
Land stewardship	General regenerative practice ^a (4), Rotational grazing (3), Managed intensive grazing (3), Easements (2)
Feed production	Leased and free use of local pastures (6), Grow more feed than buy (5)
Dairy processing/Energy production	Shift to organic (6), On-site processing, packaging, marketing (3), Direct sale to cheesemakers (2), Solar energy (2)
Value-Added products	Pudding (1), Ice cream (1), Flavored milk (1), Raw milk (1)
Non-dairy products and by-products	Maple syrup (4), Chicken (3), Culled beef (3), Surplus hay (2), Vegetables (2), Veal (2), Pork (2), Beef (2), Flowers (2), Ducks (1), Turkey (1), Honey (1), CBD (1), Grapes (1), Airbnb (1), Timber (1), Other fruit (1)
Off-farm employment	Spouse holds job off the farm (3)

^a Regeneration is derived from agroecological practices that build soil health.

and managing waste. Six (A, B, C, D, F, G) of 10 farms shifted away from conventional continuous grazing methods toward rotational or intensive grazing (Gerrish, 2004) to build soil health. Rotational grazing utilizes repeated periods of grazing and rest among two or more paddocks or pastures; managed intensive grazing is a flexible approach to rotational grazing in which animal nutrient demand through the grazing season is balanced with forage supply and available forage (Andrae, 2008). Farmers practicing managed intensive grazing also used the term “holistic” to describe their approach to caring for soil, pasture and woodlands. Two (Farms A and F) employ additional practices that reduce erosion, plant trees for their ecosystem functions, establish land conservation and river barrier easements (Farm F), and reseed native, perennial grasses.

All those engaging in differentiated grazing practices spoke of wanting to increase both the breadth (forest management) and depth (knowledge of soil health and its layers of organic constituents) of land stewardship. Grant programs that fund farm conservation practices catalyzed stewardship for some. Although these strategies were achieved for varying reasons and through varying means, they all contribute to ecological resilience, the ability of a system to absorb and adapt to environmental shocks and stresses (Meuwissen et al., 2019).

Dairy processing, value added, and nondairy livelihoods

The COVID-19 pandemic brought on supply chain disruptions, which reverberated with dairy farmers. As institutions closed, milk was being dumped due to lack of markets. In response, Northeast dairy cooperatives instated milk quotas on their member farms. Three farmers who were producing beyond the quotas decided to utilize the surplus by creating value-added products. This was accomplished through new, small, onsite processing facilities, some of them funded through pandemic relief programs. The three farmers who have installed processing facilities on site were making unique products. High fat content, organic milk was processed as ice cream or bottled with flavors such as coffee, chocolate, and maple; another farmer was making pudding (although their pro-

duction started before the pandemic disruption). These value-added production schemes filled niches in the market; farmers connected to consumers through their locally produced and processed products. Their market diversification enabled farmers to prevent loss, provided higher margins for liquid milk, and utilized byproducts to offset changes in supply chains and markets.

Small, onsite processing facilities provide autonomy, support redundancy of types and distribution of processing and expand the adaptive capacity of Northeast dairy farmers (Brinkley, 2018; Gupta et al., 2010; Walker 2020). With more processing infrastructure in the region, and with enhanced infrastructure diversity, a farmer can market their own products, build local-product demand, and normalize consumption of local food (Brinkley, 2018). However, this strategy is highly demanding of time and capital, concerns that institutions and policy need to address (Darnhofer & Strauss, 2014).

Value-added products supported farm viability (Born & Bachmann, 2006), built new market strategies, and were linked to a farmer’s stewardship practice (Maye, 2016; Sherwood & Uphoff, 2000). “We didn’t want anything that anyone else was doing and so we wandered around the grocery store and tried to figure out what was being done and what wasn’t being done” (Farm E). Farmer H had particularly fertile soil and thus chose to start growing his own crops for feed, while Farmer C chose to grow grapes on his well-drained hilltop land. Farmer A established a maple sap operation on land too steep to clear for pasture or farming, a traditional strategy of New England dairy farmers. Farmer C experimented with different tree plantings to encourage wildlife.

The choice to develop different products is often more essential for farms with smaller dairy herds (Figure 4). Farm A possessed the fewest cows and produced the greatest diversity of product; Farm J, with the greatest number of cows, sold only surplus hay in addition to conventional milk. The farms with the smallest herds, Farms A and B, have also been able to sell raw milk through a community-supported agriculture program, and at least one of them uses a low-waste model by reclaiming milk bottles. Of the farms with larger herds, diver-

sification strategies included surplus hay (Farm G and J), maple syrup (Farm H), poultry (Farm H), flowers (Farm I), and flavored milk (Farm I), the latter of which was developed during the pandemic.

The Social and Well-being Benefits of Diversification

Beyond physical and monetary benefits of diversification, farmers spoke of more affective or emotional reasons to diversify. These include relationships, quality of life, and human and nonhuman justice. Their decisions go beyond the farm's business model to enhance farmer reputation and build

relationships with neighbors and the wider community.

Relationships

Farmers spoke of feeling more connected to others through processes of diversification. For instance, development of value-added products depends on transparency and personal relationships in contrast to a disassociated, opaque wholesale milk system (Darnhofer et al., 2016). To sell flavored milk, Farm I established a network of farm stands and markets where they could refrigerate and sell their product. For one cheese producer, producing and marketing locally was found to be

Figure 4. Farms Connected to Product Diversification

Farms A-J are organized on the left axis by smallest to largest herd size in descending order (top to bottom). Each farm is connected by a line to the products it produces, labeled on the right axis.

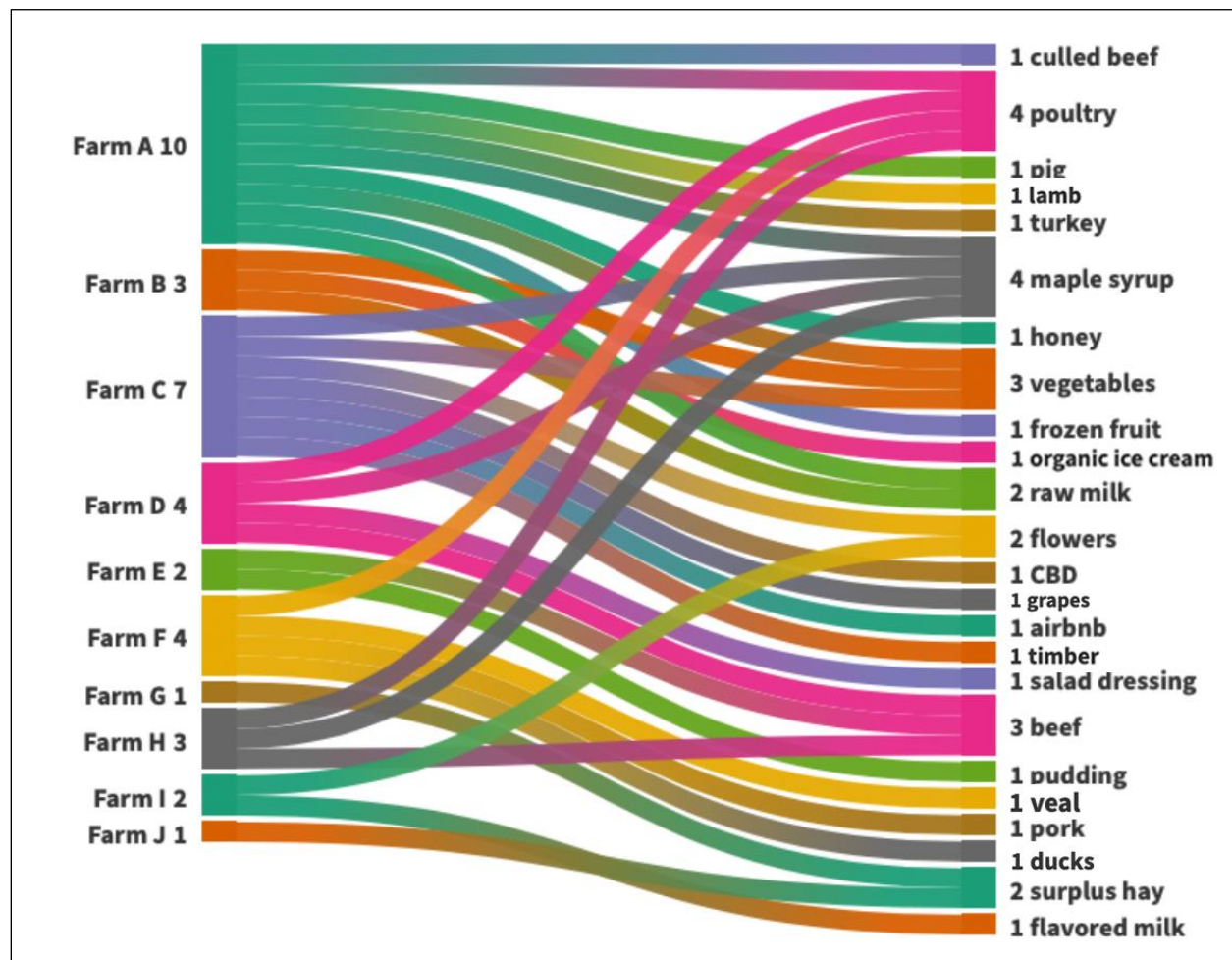


Figure produced using flourish.studio.

much more rewarding than “taking what he can get” by selling his milk wholesale, a process that transformed his milk into powder and some “unknown” product.

Everything about doing business with my cheesemakers...is wildly more rewarding than sitting here and taking what I get. ... To not feel like you're in control of what you earn is awful, and with what's happened in the dairy industry. ... I struggle with it. (Farmer H)

The disassociation of the wholesale system versus the relationality of the direct market system was expressed by other farmers and institutional representatives. For Farmer H, the care of his cows is directly related to his relationship with the cheesemaker, who believes that care for the cows is reflected in the quality and taste of his cheese. This direct connection may establish a longer-term interaction between consumer and farmer, which leads to better quality of life and supports the burgeoning local food movement (Olson, 2019).

Quality of life

Farmers often stated how little money they made annually (in one case, just \$8,000), primarily due to the low amount paid for liquid milk and difficulties in breaking even with other forms of on-farm income. Nevertheless, beyond a paycheck, farmers preferred to stay in the dairy business. Much of this choice was related to the quality of life provided on a dairy farm.

Diversification provides the feeling of independence. In addition, the versatility and multiplicity of roles on a diversified farm was perceived as more exciting than the “routine” of mundane daily tasks. Innovation is intrinsic to many of the farmers’ practices, which include experimentation and assuming multiple roles. One is not just a dairy farmer, but a soil scientist, wildlife steward, and a hog and chicken caretaker.

Many of the farmers had a farm store on their property to enable direct marketing. Some expressed appreciation for the convenience, trust, and ease of direct marketing, which has been shown to increase a farmer’s quality of life (Silva et al., 2015). Direct marketing removes the need for

loading and transporting products to farmers markets. These farmers have established sufficient trust with their community members that they leave a cash box, Venmo QR code, or other electronic means of customer payment, saving the farmer considerable time in customer service. Other sources of trust include community supported agriculture (CSA) arrangements, which represents consumer confidence in the farm.

An important value for many of the farmers was close interpersonal relationships. The cohesion of a farmer’s nuclear and extended family, connection with community members, and mental and physical support in general are nurtured in the daily activities of dairy production. Several farmers noted that diversification enabled more family members to return to (or stay on) the farm and engage in the “new” activity. For example, Farmer I moved back to the family dairy farm, leaving a lucrative career in order to be close to his family:

Most people work themselves sick. ... I would have made a lot more money sticking with my [previous profession], but I've lived a much richer life doing this. [M]y kids had access to me all the time. ... [Speaking of a fraught relationship with his brother] We went back to actually cherishing each other. ... [In this work,] relationships [are] the big thing.

By defining quality of life as being more than a paycheck, the farmers we interviewed emphasized how their relationships had improved, and that they were happier and healthier, and more connected to those around them. These immeasurable elements sometimes resulted in further diversification, as individuals returning to the land (farm) found the time and energy to pursue personal interests such as growing and selling flowers or working with their children to start new farm ventures, such as hosting guests at an on-farm Airbnb. Farmers spoke about how privileged they were in comparison to young first-generation farmers who struggle to enter the industry due to exorbitant capital costs.

Human and nonhuman justice

Building more socially just farming systems was

emphasized by many of the farmers we spoke with. Dairy farmers are beholden to the stringent pricing systems and restrictions laid out in contracts from liquid milk companies. Some of the institutional representatives we spoke with described the farmer's inability to advocate for higher prices, due to the contracts and the unfair monopolies that buyers hold over the liquid dairy markets. In addition, the dairy workers who come to the Northeast, often from Latin America, are heavily exposed to difficult working conditions with little capacity to seek better conditions and speak out for human rights. Dairy farmers face the dual pressures of an imposed silence about the unjust pricing of whole-sale milk and external social pressure to change labor practices and pay workers higher wages while maintaining good quality working and living conditions on the farm. While most of the farmers we spoke with did not hire foreign workers, they were familiar with these challenges and expressed a strong desire to pay their employees a good, livable wage. "You know, it'd be really great to be able to pay employees better, but some of those things are, you know, a function of being involved in a market that is crazy" (Farm E). To manage the challenges in the milk pricing system, some farms have provided opportunity for training an apprentice to support farm labor. Others have been transitioning to robots to milk the cows, which have freed up family members to carry out other necessary tasks.

In terms of the claims of nonhuman justice, farmers are experimenting with care practices over the lifetime of cows and bulls. Farmers often viewed these practices holistically. For instance, farmers chose to control calving cycles or selectively breed within or between species to support herd health and environmental conditions. Pairing nurse cows with two to three calves makes for more harmonious and safer growth conditions. Three of five farms (Farms A, D, G) engage two or more different livestock care practices. Three of five also crossbreed cow breeds and/or adjust feed to produce higher nutrition levels, resulting in milk with higher protein and butterfat and thus gaining a premium from organic co-ops or cheesemakers. Of the two farmers selectively breeding their cows, one crossbred different species and the other selectively breeds for smaller hooves, that less disrupt

hillside soil. Nutrition, breeding, and culling practices played into maintaining the overall health of the herd and land.

Each additional animal cared for on their farms had its own "place" or "job," performing some useful action for the health of the farm prior to its sale as meat or byproduct. In addition to generating income from their products, these animals served as a capital investment, returning value by performing key functions on the farm or increasing the value of the land. Farmer F describes her farm as a holistic collaborative system: "The pigs...help compost my bed pack before they go to market. The chickens are constantly working to aerate the entire bedded pack to control maggots [as] the pest control team. The ducks are...my water pumping station, keeping that clean. [All] have a place." Other farms kept bees for pollination, and rotationally grazed animals for carbon sequestration in the soil. These types of diversification yield benefits to humans and nonhumans alike, replacing destructive practices.

To summarize the prior two sections, farmers are increasing their resilience to shocks by implementing a variety of strategies, including physical and nonphysical changes to their farms, providing alternative income and redundancy against market shocks (Gupta et al., 2010). In addition, through many of their diversification efforts dairy farmers have reconnected with family members and the surrounding community. The resulting social networks provide support, ideas, and income while producing a more resilient, locally based, and productive dairy system (Cassidy & Barnes, 2012; Olson, 2019). Moreover, increasing the social and biological diversity of an agroecosystem increases a farm's ability to recover from natural disturbances as well as market fluctuations (Liebman & Schulte, 2015).

Supports and Barriers to Diversification

Farm resilience is related to economic viability, flexibility, and the ability to withstand market shocks (Craddock-Henry, 2021). To better understand what institutions support and hinder diversification (Ostrom, 2006), we outlined national, regional, state, and local-scale laws, cooperatives, programs, and networks that were mentioned by

farmers (Table 3). Using theories about what institutional characteristics best support resilience (Gupta et al., 2010), we examine the flexibility, resources, and learning capacity of the various institutions that farmers mentioned engaging with in their process of diversification.

Temporal financial support

Financial resources are essential to building resilience to shocks (Craddock-Henry, 2021; Gupta et al., 2010). In the process of diversifying, farmers relied upon federal financial resources to purchase equipment, provide training, and obtain certifications. One farmer (Farm G) was able to reduce energy costs by setting up a solar array using funds from the Rural Energy for America Program (REAP, Table 3). The Value-Added Producer Grant (VAPG) program which began in 2000 (USDA Rural Development, 2000) provides funding for farmers to establish value-added processing businesses for their products. The American Recovery Plan Act (ARPA) of March 2021 was a use-

ful channel for aiding farmers in the state; two farmers (Farms C and I) in Vermont utilized it to diversify their operations. The Dairy Business Innovation Center (DBIC), one of four national innovation hubs located in Vermont supported farmers with grants that enabled diversifications related to agritourism, technical assistance, and building a noncow dairy operation. Each of these programs channel federal funds into regional and local diversification efforts across the Northeast.

While farmers benefited from short-term federal programs like the ARPA (Table 4), farmers had longer-term, more direct relationships with state and local entities. For instance, one farmer (Farm A) often sought support from the Vermont Farm and Forest Viability Program organized by the Vermont Housing and Conservation Board (VHCB), which assists small farmers intending to implement diversification strategies. State institutions are well-situated to collaborate with farmers, such as through development of a market-relevant branding program to highlight the quality of local

Table 3. Programs That Farmers Stated Supported Diversification Processes

Financial resources and information supporting small dairy diversification		
Type	Program	Description based on farmer responses
Federal Government	REAP	Rural Energy for America Program: USDA initiative to finance renewable energy systems on rural farms.
	VAPG	Value-Added Producer Grant: USDA funding for farmers to establish value-added processing businesses
	COVID Relief	ARPA (American Recovery Plan Act) and other federal relief initiatives
Regional Government	DBIC	Dairy Business Innovation Center: provides funding and technical assistance for dairy diversification
State Government	VFFVP	Vermont Farm and Forest Viability Program: Vermont Housing and Conservation Board (VHCB), an initiative facilitating diversification of small farms
	State Branding	Efforts in Vermont and New Hampshire striving to establish premiums for dairy production in the state
Private	Co-ops	Useful networks for farmers to connect with each other, share knowledge, and learn about dairy economics
Nonprofit	NOFA	Northeast Organic Farming Association: forum that connects farmers and organizes programs
Nonprofit	DGA	Dairy Grazing Apprenticeship: national program that connects aspiring dairy farmers with mentors

dairy products. Collaboration is often facilitated through multi-stakeholder networks such as the Northeast Organic Farming Association that support information sharing and flexibility, both perceived to be conditions that enable transformation in the face of market shocks (Anderies et al., 2004).

Flexibility and autonomous change

Flexibility and room for autonomous change are lacking in the capital support systems that promote diversification (Gupta et al. 2010). Pandemic relief funds, for example, are temporary measures to boost economic viability, so when these supports are removed farmers may lack the capital for the transition. Farmers suggested that government actors should support multiple and more flexible funding opportunities, emphasizing fewer restrictions and less reporting requirements. This flexibility provides a more robust institutional environment to support farmers engaging in the diversification process (Anderies et al., 2004).

Some farmers distrusted state governments, due to their potential for finding noncompliance with state regulations, unmet codes, and other barriers to business development. Three farmers (Farms A, C, and D) stated that they considered state regulations barriers to diversifying. In New Hampshire, Farm E described a lack of resources and programs at the state level that would support dairy diversification. For example, in some areas, strict regulations prevent the production, sale, and in-house processing of raw milk. Act 250, Vermont's development code, stifles the addition of certain nontraditional processing operations like winemaking, preventing farmers from diversifying by establishing vineyards.

Social networks, relationships and information sharing

As farmers pursue new diversification strategies, they find more people with whom they can exchange information, concerns, and ideas about specific crops and animals. Strong informal farmer networks provide opportunities for farmers to obtain funding, knowledge, and build relationships, contributing to their resilience. In the face of broad-scale shocks, community networks provide an effective way to share strategies that have and have not worked, especially in smaller communities

(Ghose & Pettygrove, 2014).

Similarly, nongovernmental organizations serve as important sources of communication about grant opportunities and expertise supporting diversification that cross multiple levels of governance from federal to local (Table 4). The Northeast Organic Farming Association (NOFA) connects farmers and organizes educational programs to share information such as how to build soil health. The Dairy Grazing Apprenticeship, a national program that pairs aspiring dairy farmers with "grazing mentors," strengthened social networks between participating farms (A, D, and G) that in turn received monetary and technical assistance.

Despite these social networks, farmers discussed concerns in which networks are absent but needed. One concern is connecting products to consumers. When farmers introduce new products, they may find it difficult to enter the market, which can cause significant losses. Regional nonprofit networks can provide both a forum (at regional conferences) and an information network where farmers can find new ideas or gain support that will allow them to focus on their farming operations. One farmer (Farm A) lamented the closure several years ago of the Rutland Area Food and Farm Link (RAFFL), a nonprofit in central Vermont dedicated to connecting agricultural products with local markets, which left a gap in the southern Vermont agricultural network. The Intervale Center in northern Vermont is a nonprofit connecting farmers to local markets and supporting regenerative agriculture, but a similarly robust organization is not found elsewhere in the two states. RAFFL and Intervale demonstrate the role of local organizations in building resilient farming networks. The presence of Intervale strengthens farmers' ability to diversify, but the absence of RAFFL reduces their confidence in their ability to remain economically viable.

Personal connections were the most cited source of information supporting diversification. "It's all visual, really. We go by each other's farms. We see what the others are doing. And if something sparks our interests, we pull in and ask the farmer, you know, how'd that go for you?" (Farmer A). Sharing information enables farmers to learn about diversification before committing time

and resources. “We all just feed off each other and we share information. It's very noncompetitive, that makes a big difference when you're in the area or an industry where you're helping each other because...not one family can figure it all out” (Farmer F). During a “pasture walk,” farmers take a tour of another farmer's pasture while discussing soil health, grazing practices, and fostering relationships. One farmer (Farm H) investigated raising wagyu beef because a friend's father started raising the cattle. Another farmer (Farm C) learned grazing strategies from a college professor and wanted to try them out himself. Overall, these exchanges greatly support diversification.

Land sharing is also common among those practicing regenerative grazing techniques. Six (A, D, G, H, I, J) of 10 farms graze cows part time on neighbors' pastureland. Several of them have informal agreements to “mow” the neighbor's lawn. Many of the neighborly relationships go back several generations. Farms also rent grazing land from others.

Because these networks are widespread and informal, those not involved have usually made the effort to stay independent. Many farmers see themselves as self-sufficient, which tends to build individual over collective responsibility and discourages engagement in networks and programs: “Some farmers just really kind of want to be left alone...there [are] some clichés about the personality of folks who go into dairy ... it is kind of an isolated profession.” Despite this tendency, many farmers emphasized the importance of connection to others as critical to building farm resilience.

The support and rigidity of cooperatives (co-ops)

By establishing strong and enduring relationships between their members, co-ops build social capital and share knowledge. For example, farmers who transition toward organic are often “welcomed” into not only a new market, but a new social network, group of advisors and technicians, and an institutional arena where grants, loans, and services can be obtained. Farmer G commended Organic Valley:

That's one of the things that Organic Valley does extremely well. ... We have multiple staff

veterinarians, nutritionists, agronomists ... and you can ... interact with him often about ... the feed quality [to know] what we need to do. ... I hear from other farmers that that's something that is really lacking for a lot of other farmers.

Remaining within the fluid milk market with premiums helps dairy farms maintain much of their original function and structure without too much infrastructure change. It also requires minimal new training for experienced farmers, allowing for consistent labor throughout the transition. Importantly, some of these transitions also help farmers expand their market base beyond that of their co-ops and fluid milk markets.

All but one of the farmers with whom we spoke belong to one of three dairy cooperatives in the region. Four farmers (Farms C, E, F, and J) felt that co-ops build the social network of farmers. This typically occurs through co-op meetings, where farmers influence co-op operations and rules, share knowledge about diversification strategies, and learn the latest trends in commodity markets. Stronger social networks tend to correlate with greater system resilience (Cassidy & Barnes, 2012), so engagement in a co-op likely contributes to farm success. While one institutional actor stated that not enough farmers are involved in co-op management, Farm F claimed that his co-op had generally “good attendance...I bet you 30% to 40% of the farmers might go to these meetings.” Two farmers (Farms C and G) specifically stated that they felt their co-op cared about the well-being of small farmers. According to two institutional respondents, value-added production, such as cheese and yogurt, can be much easier and profitable at a co-op scale than through an individual farm.

On the other hand, some aspects of co-ops create “rigidity traps” (Stedman, 2016), i.e., self-reinforcing elements of a system that tend toward certain ways of thinking and behaving that ignore others and are difficult to transform (p. 891). Co-op rules can restrict farmers from engaging in their own value-added dairy businesses. Co-op participation and democratic decision-making is reduced when smaller local co-ops are absorbed by larger regional or national co-ops. One institutional actor

felt that larger co-ops care less about the well-being of small farmers; another expressed concern about farmer ability to participate in the policy-setting of larger co-ops headquartered outside northern New England.

I think [participation is] harder. It's not impossible, but it's certainly harder. ... The DFA [Dairy Farmers of America] ... their headquarters is in Syracuse. ... That's an overnight trip and not as easy to stop in and, you know, take an afternoon ... and still be able to get home to do the farming at night. (Inst 4)

The size and location of co-ops impacts the ability to challenge rules, share information, and engage in the political process in defense of their livelihood (Méndez et al., 2019). In smaller co-ops, farmers not only receive the knowledge sharing and technical support discussed above, but they also have more confidence that their co-op has their interests in mind. In a larger co-op, diversification is hindered by the need for large-scale commodity milk, and the community connections that are so important to farmers are difficult to form.

The process that the co-op uses to determine prices each year is also rigid, not always reflecting market shocks. "All the producers have to tell Organic Valley at the beginning of the year how much milk they're going to produce throughout the year. Organic Valley takes those numbers and goes to its sales team, and says, 'Okay, this is what we're going to have to sell, this is what we have to market,' and they give us a price." (Farmer D). The annual price determination insulates farmers from market fluctuations, but also means they would not benefit from a price increase. An institutional actor explained that the determination can result in the co-op losing money if the price of milk drops, so that the co-op may choose to lower the price it pays farmers the following year.

In summary, farmers found many ways that diversification is supported or hindered through institutional processes. Primary barriers are regulations that restrict small farms from diversification while benefiting larger operators. At the state and co-op level, especially, farmers are prevented or hindered from carrying out new diversification

strategies. More favorable regulations could allow a boost in diversification. The most important supports to diversification are capital, through grants and support networks, and information sharing through official networks and community groups. Capital is necessary to overcome the costs of establishing new forms of production, especially value-added dairy operations. Open information sharing, especially among neighbors, is crucial in enabling farmers to try new strategies.

Conclusions and Recommendations

This study has assessed the ways in which dairy farmers have conceived of and embarked upon pathways toward resilience by analyzing processes and institutions supporting or inhibiting diversification. Overall, small dairies in the Northeast provide an important case study as to how diversification can contribute to a more resilient food system, which is enhanced by social networks and institutional support. As evidenced by the diversification of small dairy farmers in the Northeast, the dairy industry is adapting to a shifting market characterized by dichotomous patterns of both farm consolidation and farm-to-consumer re-localization. While some have argued that the Northeast is not able to compete with Midwestern dairies to produce milk, whether organic or conventional, under the current structures (Benson, 2020; Real Organic, 2022), the individuals we spoke with see dairy as essential to the social fabric of the Northeast as well as an important part of a national strategy to build a climate resilient food system.

Choosing when and how to diversify a dairy operation is no small task and demands significant risk, financial capital, management ability, and physical and mental energy. For most farmers, their broad motivation for diversification was based on both survival and betterment of their situation, based on quality of life for humans and nonhumans. As past research on dairy farms shows (Cradock-Henry, 2021), Northeast farmers are utilizing a range of responses to cope with stresses, including those related to environmental and economic shifts. We identified multiple diversifications including higher premiums from organic or directly marketed liquid milk, value-added dairy products, nondairy farm products, and building soil health

through land management practices. We have discussed factors that influence diversification, as well as some of the perceived benefits and barriers.

The elements which, when conjoined, tend to support Northeast farmer diversification include transparency and open sharing of knowledge and information and strong social networks based on interpersonal relationships as well as networked institutions, both NGOs and government (Cassidy & Barnes, 2012). Perceived barriers to diversification include lack of capital (natural, social, and economic), a strict regulatory environment, prohibitive wholesale commodity contracts, limited time and labor, and milk market saturation. Despite these barriers, farmers persist in experimentation with dairy and other modes of farming, motivated by a long-standing relationship with their land, their community, and their animals.

Diversification provides expansive market opportunities when liquid milk buyers withdraw. In March 2022, in light of Horizon/Danone and Maple Hill's withdrawal, the co-op Organic Valley/CROPP offered to purchase milk from 90 of the 135 dairy farms whose contracts were to be terminated in late 2022 (Cotton, 2022). While boosting the Northeast dairy market, the co-op cannot alone provide the buffer needed to create a more resilient dairy system. To bolster the dairy industry and improve its viability in the Northeast, farmers need more and consistent institutional support that supports diversification, such as local processing

facilities, more diverse and inclusive dairy cooperatives, and enforcement of quality controls, such as the pasture and origin of livestock rules, to strengthen organic standards and promote regenerative practices.

Diversification processes support both resilience of the dairy industry and a transformation of Northeast agriculture. We find that these processes will continue to be necessary to support the viability and resilience of dairy farming in the Northeast. Overall, the issues facing dairy farmers originate in an unfair pricing system that deeply undercuts the balance of price of milk and costs of production. Finding pathways for transformation is essential. These innovative farmers have demonstrated that this is difficult, but possible even within the continuing unfavorable economic system for dairy farming.

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References

- Allbee, R. (2018, April 1). Opinion: Vermont dairies' continuing challenges. *VT Digger*.
<https://vtdigger.org/2018/04/01/roger-allbee-vermont-dairies-continuing-challenges/>
- Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and Society*, 9(1), 1–17. <https://www.jstor.org/stable/26267655>
- Andrae, J. (2008). Rotational grazing benefits and specific methods. *American Association of Bovine Practitioners Conference Proceedings: Beef Sessions*. <https://doi.org/10.21423/aabppro20084376>
- Benson, F. (2020, January 13). USDA Puts Northeast organic dairies at a disadvantage. *Small Farms Quarterly*. Cornell Small Farms Program, Cornell College of Agriculture and Life Sciences.
<https://smallfarms.cornell.edu/2020/01/usda-puts-northeast-organic-dairies-at-a-disadvantage/>
- Bezio, M. (2009). *An agricultural history of Manchester, Vermont*. Vermont Barn Census.
<http://www.uvm.edu/~hp206/2009/Manchester/History.html>
- Birthal, P. S., & Hazrana, J. (2019). Crop diversification and resilience of agriculture to climatic shocks: Evidence from India. *Agricultural Systems*, 173, 345–354. <https://doi.org/10.1016/j.agry.2019.03.005>

- Born, H., & Bachmann, J. (2006). *Adding value to farm products: An overview* (IP141). Appropriate Technology Transfer for Rural Areas Sustainable Agriculture, National Center for Appropriate Technology.
<https://attra.ncat.org/publication/adding-value-to-farm-products-an-overview/>
- Brinkley, C. (2018). The small world of the alternative food network. *Sustainability*, 10(8), Article 2921.
<https://doi.org/10.3390/su10082921>
- Carlisle, L. (2016). Factors influencing farmer adoption of soil health practices in the United States: A narrative review. *Agroecology and Sustainable Food Systems*, 40(6), 583–613. <https://doi.org/10.1080/21683565.2016.1156596>
- Cassidy, L., & Barnes, G. D. (2012). Understanding household connectivity and resilience in marginal rural communities through social network analysis in the village of Habu, Botswana. *Ecology and Society*, 17(4), Article 11.
<https://doi.org/10.5751/es-04963-170411>
- Chonabayashi, S., Jithitikulchai, T., & Qu, Y. (2020). Does agricultural diversification build economic resilience to drought and flood? Evidence from poor households in Zambia. *African Journal of Agricultural and Resource Economics*, 15(1), 65–80. <https://doi.org/10.22004/ag.econ.307618>
- Cotton, E. (2021, August 23). Danone, owner of Horizon Organic, to terminate contracts with Vermont farmers. *VT Digger*. https://vtdigger.org/2021/08/23/danone-owner-of-horizon-organic-terminates-contracts-with-vermont-farmers/?is_wppwa=true&wpappninja_cache=friendly
- Cotton, E. (2022, March 8). Organic Valley to take as many as 90 farmers dropped by Horizon, Maple Hill. *VT Digger*. <https://vtdigger.org/2022/03/08/organic-valley-to-take-as-many-as-90-farmers-dropped-by-horizon-maple-hill/>
- Cradock-Henry, N. A. (2021). Linking the social, economic, and agroecological: A resilience framework for dairy farming. *Ecology and Society*, 26(1), Article 3. <https://doi.org/10.5751/es-12122-260103>
- Cutler, C. (2021, October 12). Milk hauler shortage drives Vermont dairy dilemma. *WCAX*.
<https://www.wcax.com/2021/10/12/milk-hauler-shortage-drives-vermont-dairy-dilemma/>
- Darnhofer, I., Lamine, C., Strauss, A., & Navarette, M. (2016). The resilience of family farms: Towards a relational perspective. *Journal of Rural Studies*, 44, 111–122; <https://doi.org/10.1016/j.jrurstud.2016.01.013>
- Darnhofer, I., & Strauss, A. (2014). Resilience of family farms: Understanding the trade-offs linked to diversification. In T. Aenis, A. Knierim, M. C. Riecher, R. Ridder, H. Schobert, & H. Fischer, (Eds.), *Proceedings of the 11th European IFSA Symposium, Farming systems facing global challenges: Capacities and strategies* [April 1–4, 2014, Berlin, Germany] (pp. 1777–1787).
https://boku.ac.at/fileadmin/data/H03000/H73000/H73300/PJ/rethink/WS_2_11_Darnhofer.pdf
- Dumont, B., L. Puillet, G. Martin, D. Savietto, J. Aubin, S. Ingrand, V. Niderkorn, L. Steainmetz, & Thomas, M. (2020). Incorporating diversity into animal production systems can increase their performance and strengthen their resilience. *Frontiers in Sustainable Food Systems*, 4, Article 109. <https://doi.org/10.3389/fsufs.2020.00109>
- Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16(3), 253–267. <https://doi.org/10.1016/j.gloenvcha.2006.04.002>
- Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4), Article 20.
<https://doi.org/10.5751/es-03610-150420>
- Gallopin, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, 16(3), 293–303. <https://doi.org/10.1016/j.gloenvcha.2006.02.004>
- Gerrish, J. (2004, May 6). Benefits of Management-Intensive Grazing. *Illinois Livestock Trail*. University of Illinois Extension. <http://livestocktrail.illinois.edu/pasturenet/paperDisplay.cfm?ContentID=6614>
- Ghose, R., & Pettygrove, M. (2014). Actors and networks in urban community garden development. *Geoforum*, 53, 93–103. <https://doi.org/10.1016/j.geoforum.2014.02.009>
- Gilman, S. (2021, November 30). *Groupe Danone and Horizon Organic*. Northeast Organic Farming Association.
<https://nafa.org/2021/11/30/on-the-organic-dairy-horizon/>

- Ginsburg, L., & Lundgren, B. (2021, December 16). *Recommendations to the USDA: Recommendations for response to Danone/Horizon and Maple Hill market exit and for long-term systems improvement for the northeast dairy sector*. Northeast Dairy Task Force.
<https://s3.documentcloud.org/documents/21174042/northeast-dairy-task-force-recommendations-to-usda.pdf>
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.
- Gupta, J., Termeer, C., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., Nooteboom, S., & Bergsma, E. (2010). The Adaptive Capacity Wheel: A method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. *Environmental Science & Policy*, 13(6), 459–471.
<https://doi.org/10.1016/j.envsci.2010.05.006>
- International Panel of Experts on Sustainable Food Systems (IPES-Food). (2016). *From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems* [Report No. 2].
https://www.ipes-food.org/_img/upload/files/UniformityToDiversity_FULL.pdf
- International Panel on Climate Change. (2019). Summary for policymakers. *Climate change and land: A special report*.
<https://www.ipcc.ch/srccl/>
- Jeffords, J. M. (2010). *Milk pricing and the Vermont dairy industry*. Vermont Legislative Research Service, University of Vermont. https://www.uvm.edu/sites/default/files/Department-of-Political-Science/vlrs/agriculture/Milk_Pricing_and_the_Vermont_Dairy_Industry.pdf
- Jones, C. (2008). *Our soils, our future*. Australian Soil Carbon Accreditation Scheme.
[https://www.amazingcarbon.com/PDF/JONES-OurSoilsOurFuture\(8July08\).pdf](https://www.amazingcarbon.com/PDF/JONES-OurSoilsOurFuture(8July08).pdf)
- Kolstrup, C. L., Kallioniemi, M., Lundqvist, P., Kymäläinen H.-R., Stallones, L., & Brumby, S. (2013). International perspectives on psychosocial working conditions, mental health, and stress of dairy farm operators. *Journal of Agromedicine*, 18(3), 244–255. <https://doi.org/10.1080/1059924X.2013.796903>
- LaCanne, C. E., & Lundgren, J. G. (2018). Regenerative agriculture: Merging Farming and Natural Resource Conservation profitably. *PeerJ Preprints*, 5, Article e3464v1. <https://doi.org/10.7287/peerj.preprints.3464v1>
- Liebman, M., & Schulte, L. A. (2015). Enhancing agroecosystem performance and resilience through increased diversification of landscapes and cropping systems. *Elementa: Science of the Anthropocene*, 3, Article 000041.
<https://doi.org/10.12952/journal.elementa.000041>
- Lin, B. B. (2011). Resilience in agriculture through crop diversification: Adaptive management for environmental change. *BioScience*, 61(3), 183–193. <https://doi.org/10.1525/bio.2011.61.3.4>
- MacDonald, J. M., Law, J., & Mosheim, R. (2020). *Consolidation in U.S. dairy farming* (ERR No. 274). U.S. Department of Agriculture Economic Research Service. <https://www.ers.usda.gov/publications/pub-details/?pubid=98900>
- Madelrieux, S., Terrier, M., Borg, D., & Dobremez, L. (2015). Family dairy farms in the northern French Alps: Persistence and adaptation in a changing world. *Mountain Research and Development*, 35(1), 49–56.
<https://doi.org/10.1659/MRD-JOURNAL-D-14-00011.1>
- Maltby, E. (2021). *Danone's concessions to Northeast dairy farmers is a small step toward honoring their social responsibility commitment*. Northeast Organic Dairy Producers Alliance. <https://nodpa.com/n/7016/Danones-Concessions-to-Northeast-Dairy-Farmers-Is-a-Small-Step-Toward-Honoring-their-Social-Responsibility-Commitment>
- Maye, D. (2016). Examining innovation for sustainability from the bottom up: Analysis of the permaculture community in England. *Sociologia Ruralis*, 58(2), 331–350. <https://doi.org/10.1111/soru.12141>
- Méndez, P. F., Amezcaga, J. M., & Santamaría, L. (2019). Explaining path-dependent rigidity traps: Increasing returns, power, discourses, and entrepreneurship intertwined in social-ecological systems. *Ecology and Society*, 24(2), Article 30.
<https://doi.org/10.5751/ES-10898-240230>
- Meuwissen, M. P. M., Feindt, P. H., Spiegel, A., Termeer, C. J. A. M., Mathijs, E., Mey, Y. de, Finger, R., Balman, A., Wauters, E., Urquhart, J., Vigani, M., Zawalińska, K., Herrera, H., Nicholas-Davies, P., Hansson, H., Paas, W., Slijper, T., Coopmans, I., Vroege, W. ... Reidsma, P. (2019). A framework to assess the resilience of farming systems. *Agricultural Systems*, 176, Article 102656. <https://doi.org/10.1016/j.agsy.2019.102656>
- National Park Service. (2000). *Explore history in the heart of the Green Mountains: Agriculture & industry*. U.S. Department of the Interior. <https://www.nps.gov/nr/travel/centralvermont/agind1.htm>

- Olson, K. A. (2019). The town that food saved? Investigating the promise of a local food economy in Vermont. *Local Environment*, 24(1), 18–36. <https://doi.org/10.1080/13549839.2018.1545753>
- Ostrom, E. (2006). *Understanding institutional diversity*. Princeton University Press.
- Parsons, B. (2010). *Vermont's dairy sector: Is there a sustainable future for the 800 lb. gorilla?* (Opportunities for Agriculture Working Paper Series 1(4)). Food System Research Collaborative, University of Vermont Center for Rural Studies. <https://scholarworks.uvm.edu/cgi/viewcontent.cgi?article=1008&context=fsagriculture>
- Perrin, A., & Martin, G. (2021). Resilience of French organic dairy cattle farms and supply chains to the Covid-19 pandemic. *Agricultural Systems*, 190, Article 103082.
- Real Organic. (2022). Ed Maltby: Organic dairy contracts create a code of fear (Real Organic Podcast Episode #078). <https://www.realorganicproject.org/ed-maltby-organic-dairy-contracts-create-code-of-fear-seventy-eight/>
- Reed, E., & Weiss-Tisman, H. (2021, September 30). Vermont organic dairy farms fight to survive as industry consolidates. *Vermont Public Radio*. <https://www.vpr.org/vpr-news/2021-09-30/vermont-organic-dairy-farms-fight-to-survive-as-industry-consolidates>
- Schoenfeld, W. A. (1927). *Some economic aspects of the marketing of milk and cream in New England* (Cooperative Marketing Division Circular 16). U. S. Department of Agriculture.
- Sherwood, S., & Uphoff, N. (2000). Soil health: Research, practice and policy for a more regenerative agriculture. *Applied Soil Ecology*, 15(1), 85–97. [https://doi.org/10.1016/s0929-1393\(00\)00074-3](https://doi.org/10.1016/s0929-1393(00)00074-3)
- Silva, E., Dong, F., Mitchell, P., & Hendrickson, J. (2015). Impact of marketing channels on perceptions of quality of life and profitability for Wisconsin's organic vegetable farmers. *Renewable Agriculture and Food Systems*, 30(5), 428–438. <https://doi.org/10.1017/S1742170514000155>
- Sinclair, K., Curtis, A., Mendham, E., & Mitchell, M. (2014). Can resilience thinking provide useful insights for those examining efforts to transform contemporary agriculture? *Agriculture and Human Values*, 31(3), 371–384. <https://doi.org/10.1007/s10460-014-9488-4>
- Sinclair, W. (1981, December 5). Cheese giveaway churning. *The Washington Post*. <https://www.washingtonpost.com/archive/politics/1981/12/05/cheese-giveaway-churning/4f3aa750-cf4b-494d-b87a-5a02c94336f5/>
- Sneessens, I., Sauvée, L., Randrianasolo-Rakotobe, H., & Ingrand, S. (2019). A framework to assess the economic vulnerability of farming systems: Application to mixed crop-livestock systems. *Agricultural Systems*, 176, Article 102658. <https://doi.org/10.1016/j.agsy.2019.102658>
- Snider, M. A., Ziegler, S. E., Darby, H. M., Soder, K. J., Brito, A. F., Beidler, B., Flack, D. S., Greenwood, D. S. L., & Niles, M. T. (2022). An overview of organic, grassfed dairy farm management and factors related to higher milk production. *Renewable Agriculture and Food Systems*, 37(6), 624–632. <https://doi.org/10.1017/S1742170521000284>
- Snorek, J., Moser, L., & Renaud, F. G. (2017). The production of contested landscapes: Enclosing the pastoral commons in Niger. *Journal of Rural Studies*, 51, 125–140. <https://doi.org/10.1016/j.jrurstud.2017.01.015>
- Snorek, J., Renaud, F. G., & Kloos, J. (2014). Divergent adaptation to climate variability: A case study of pastoral and agricultural societies in Niger. *Global Environmental Change*, 29, 371–386. <https://doi.org/10.1016/j.gloenvcha.2014.06.014>
- Stedman, R. C. (2016). Subjectivity and social-ecological systems: A rigidity trap (and sense of place as a way out). *Sustainability Science*, 11(6), 891–901. <https://doi.org/10.1007/s11625-016-0388-y>
- Szymczak, L. S., de Faccio Carvalho, P. C., Lurette, A., de Moraes, A., de Albuquerque Nunes, P. A., Martins, A. P., & Moulin, C.-H. (2020). System diversification and grazing management as resilience-enhancing agricultural practices: The case of crop-livestock integration. *Agricultural Systems*, 184, Article 102904. <https://doi.org/10.1016/j.agsy.2020.102904>
- Thornton, P. K. (2010). Livestock production: Recent trends, future prospects. *Philosophical Transactions of the Royal Society B*, 365, 2853–2867. <https://doi.org/10.1098/rstb.2010.0134>
- U.S. Department of Agriculture [USDA]. (2022, March 29). *USDA publishes Origin of Livestock final rule for organic dairy* [Press release 0069.22]. <https://www.usda.gov/media/press-releases/2022/03/29/usda-publishes-origin-livestock-final-rule-organic-dairy>

- USDA Farm Service Agency. (2004). *Milk Price Support Program fact sheet*.
https://www.fsa.usda.gov/Internet/FSA_File/mpsp04.pdf
- USDA Rural Development. (2000). *Value Added Producer Grant factsheet*.
https://www.rd.usda.gov/sites/default/files/fact-sheet/508_RD_FS_RBS_VAPG.pdf
- U.S. General Accounting Office [GAO]. (1988). *Dairy Termination Program: A perspective on its participants and milk production* (GAO-RCED 88-157). GAO Report to Congressional Requesters. <https://www.gao.gov/assets/rced-88-157.pdf>
- Walker, B. 2020. Resilience: what it *is* and is *not*. *Ecology and Society* 25(2), 11.
<https://doi.org/10.5751/ES-11647-250211>
- Walsh, J., Parsons, R., Wang, Q., & Conner, D. (2020). What makes an organic dairy farm profitable in the United States? Evidence from 10 years of farm level data in Vermont. *Agriculture*, 10(1), Article 17.
<https://doi.org/10.3390/agriculture10010017>
- Wang, Q., Liu, C. Q., Zhao, Y. F., Kitsos, A., Cannella, M., Wang, S. K., & Lei, H. A. N. (2020). Impacts of the COVID-19 pandemic on the dairy industry: Lessons from China and the United States and policy implications. *Journal of Integrative Agriculture*, 19(12), 2903–2915.
- Wironen, M. B., Bennett, E. M., & Erickson, J. D. (2018). Phosphorus flows and legacy accumulation in an animal-dominated agricultural region from 1925 to 2012. *Global Environmental Change*, 50, 88–99.
<https://doi.org/10.1016/j.gloenvcha.2018.02.017>
- Yonkers, R. D., Dvorak, K., Knutson, R. D., Bausell, Jr., C. W., & Cherlow, J. R. (1987). Impact of the Milk Diversion Program on milk supplies. *North Central Journal of Agricultural Economics*, 9(2), 157–162.
<https://doi.org/10.2307/1349385>

The motivations, challenges and needs of small- and medium-scale beginning farmers in the midwestern United States

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Abstract

Beginning farmers are increasingly recognized as important agricultural actors in the United States. Efforts to help interested individuals enter agriculture have increased; however, there is still a substantial knowledge gap regarding beginning farmers' characteristics, motivations to farm, challenges, and information and resource needs, particularly among those who operate small or medium-sized farms. In this research, we collected and analyzed

survey data in Indiana to gain a better understanding of small- and medium-scale beginning farmers in the midwestern United States. We found that small- and medium-scale beginning farmers were motivated by their desire for a farming lifestyle and to support local food and agroecological farming systems on a landscape dominated by commodity crops. They relied substantially on off-farm income and faced related challenges including limited access to labor and difficulty balancing their on-farm and off-farm responsibilities. Finding effective

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marketing strategies also challenged this group of farmers, as they were not well-integrated into existing agricultural programs, and many had limited interactions with agricultural agencies and organizations. Instead, the majority of small- and medium-scale beginning farmers relied heavily on their own internet research and informal interactions with other farmers to learn and obtain help for their farms. Together, our results contribute to a better understanding of small- and medium-scale beginning farmers' characteristics, motivations, and farming practices, as well as the challenges they face and the support they need to address these challenges. Because beginning farmers often differ from their more established counterparts who operate larger farms, the results of this research can be used to inform tailored agricultural programs and technical assistance that address small- and medium-scale beginning farmers' specific needs and challenges in order to increase their likelihood of success to not only start but also sustain a small- or medium-scale farm over time.

Keywords

Diversified Agricultural Systems, Sustainable Food System, Small-Scale Farming, Beginning Farmer, Sustainability, Local Food

Introduction

The importance of beginning farmers in the United States is increasingly recognized, particularly with the current changing demographic of farmers in the country. According to the 2017 Census of Agriculture, the average age of farmers in the U.S. was 57.5 years (USDA NASS, 2020). A recent study by the American Farmland Trust reported that "including nonoperator landlords, seniors aged 65 and older own more than 40 percent of the agricultural land in the United States. This suggests an impending transfer of more than 370 million acres of farmland" (Freedgood et al., 2020, p. 18). These statistics have raised questions concerning the potential trajectory of farm succession and the subsequent implications for land use and food production (Jöhr, 2012; Lobley et al., 2010). It is possible that some of this agricultural land will be passed on to the younger family members of current landowners, who may have already been involved in the

agricultural enterprise. At the same time, some land will be acquired by beginning farmers, who have little experience farming. The U.S. Census of Agriculture shows that currently, one in four farmers in the U.S. is a beginning farmer, defined as an individual with 10 or fewer years of agricultural experience (USDA NASS, 2019). While this includes those who have grown up on or around farms but have no formal agricultural experience, many beginning farmers in the U.S., particularly younger ones, do not have any farming background (Young Farmers Coalition, 2017). As such, it is of great importance to society to understand beginning farmers' challenges and needs to develop policies and programs that support them.

Historically, provisions in the 1992 Farm Act called for special terms in loan programs for new farmers (Thilmany & Ahearn, 2013). The 2002 version of the Farm Act included additional support for beginning farms. Multiple governmental institutions have made explicit efforts to engage and assist beginning farmers, such as the USDA's Sustainable Agriculture Research and Education program and the Beginning Farmer and Rancher Development Program, administered by the USDA's National Institute of Food and Agriculture. The USDA Farm Service Agency (FSA) offers loans directed at beginning farmers. In 2020, the FSA allocated \$3.4 billion to beginning farmers through direct and guaranteed total loan assistance (USDA ERS, 2022). These institutional initiatives and efforts have evolved over time to help interested individuals enter agricultural production, improve beginning farmers' access to information and other resources, facilitate collaboration between beginning farmers and other stakeholder groups, and promote environmental sustainability practices among beginning farmers (Niewolny & Lillard, 2010; Jablonski et al., 2022; Suryanata et al., 2021).

While increasing attention has been given to issues involving beginning farmers among agricultural policymakers and practitioners, preconceptions about this population are varied and shifting (Ahearn, 2011; Iles et al., 2020; Jablonski et al., 2022). There is still much to learn about how these farmers decide to enter the farming business, how they manage their farms, and what barriers and opportunities they face throughout this process, as in-

formation about beginning farmers is relatively unknown in comparison to the more established farmer population (Ahearn & Newton, 2009).

We drew on a survey of beginning farmers in Indiana to increase our understanding of this population and to inform programming that responds to the needs of these producers. Our research focused on beginning farmers who were operating, or interested in starting, a small or medium-sized farm. Specifically, we documented their demographics (e.g., gender, education, military status) and identified the similarities and differences across different types of beginning farmers in their farming motivations, needs, and challenges. We found that most of these farmers were interested in diversified agricultural production and were particularly motivated by the idea of using their farm to support local food systems. We also discovered that most of these farmers found balancing on-farm and off-farm responsibilities, accessing labor, and identifying marketing strategies particularly challenging. Furthermore, we identified multiple differences in motivations for farming and perceived challenges between men and women and between military- and non-military-affiliated farmers. We believe insights learned from this beginning farmer population in Indiana are important for informing how policymakers, extension specialists, and other natural resource professionals can more effectively support and collaborate with a variety of beginning farmers, particularly those who operate small or medium-sized farms, for the benefit of local communities, economies, and environments.

Literature Review

The existing literature on beginning farmers in the U.S. has shown that they differ from their more established counterparts in several ways. For example, their farms tend to be small to medium-sized in both acres and production value. Specifically, the average size of new farms in the U.S. is 324 acres, much smaller than the average size of all farms (i.e., 445 acres as of 2021; USDA ERS, 2022), and more than half of the new farms (52%) are operating less than 50 acres of land (USDA NASS, 2019). The eligibility requirements of many long-established federal farming assistance programs often disqualify small-scale farms that focus on non-commodity

products (Ahearn, 2011). Thus, beginning farmers who operate a small-scale or medium-scale farm may be excluded from the existing policies and programs designed to assist more established, larger-scale farmers (Calo, 2018; Carlisle et al., 2019; Carolan, 2018; Iles et al., 2021; Katchova & Ahearn, 2016; Ngo & Brklacich, 2014).

Beginning farmers in the U.S. also tend to be more diverse than their more established counterparts with respect to age, gender, and livelihood strategies (Ahearn, 2011; Iles et al., 2020; Iles et al., 2021). Some studies have depicted beginning farmers as younger and more educated than established farmers (Ahearn, 2011; Armbruster & Ahearn, 2014). Indeed, the 2017 U.S. Census of Agriculture reported that the average age of beginning farmers in the U.S. was 46.3 (USDA NASS, 2020). While this is younger than the average of all farmers (57.5 years; USDA NASS, 2020), Bubela (2016) pointed out, “although most young farmers are beginning farmers, most beginning farmers are not young farmers” (p. 2). In addition, women farmers are more likely to be a beginning farmer than an established farmer, according to the USDA definition of beginning farmer as one having 10 years or less of farming experience (USDA NASS, 2020).

The high capital requirement to start a farm and the limited land available to buy or rent are seen as challenges for beginning farmers across a variety of contexts (Ahearn & Newton, 2009; Calo, 2018; Carlisle et al., 2019; Katchova & Ahearn, 2016). A recent study by Jablonski et al. (2022) also reaffirmed that many beginning farmers are constrained by a lack of access to credit and to federally subsidized crop insurance.

Within the literature, holding multiple jobs, or pluriactivity, has been documented as a common livelihood strategy among farmers in the U.S., particularly small-scale farmers (Bessant, 2008; Iles et al., 2021). Specifically, 58% of farmers in the U.S. hold a primary occupation other than farming (USDA NASS, 2019). Farm income is, and will remain, a volatile component of agricultural production. Therefore, off-farm jobs can offer a more consistent revenue stream, “particularly for young and beginning farmers who tend to face more variation relative to their assets than operators of larger, more established farms do” (Bubela, 2016,

p. 5). There remains an assumption that a household's engagement in pluriactivity indicates an eventual end to their reliance on agriculture (Kinsella et al., 2000; Van der Ploeg & Renting, 2000). However, it has also been argued that pluriactivity is a stable rather than transitional phenomenon (Kinsella et al., 2000). Pluriactivity is integral to maintain farm viability (Bessant, 2008; Iles et al., 2021) and support rural communities (Van der Ploeg & Renting, 2000). At the same time, it should be noted that there has been a rise in "zero-sales farmers" who do not sell their agricultural products (Rosenberg, 2017), and many beginning farmers do not intend to farm full time (Song et al., 2022). Other beginning farmers may "transition gradually to agriculture from other professions, using off-farm income as a bridge" (Thilmany & Ahearn, 2013, p. 12). These individuals may move from professional or technical backgrounds unrelated to agriculture, hoping to "transition into a new, more rural lifestyle that creates value-based linkages in their community" and use their professional or technical skills to develop business models focused on direct marketing (Meyer et al., 2011, p. 4). Such combined work strategies can contribute to their technical and financial viability; however, these strategies can also be challenging for beginning farmers, as they need to be able to balance both on-farm and off-farm work (Bubela, 2016; Iles et al., 2021). Thus, we need a better understanding of the diverse goals of beginning farmers and the role of pluriactivity in supporting their new farms in order to better inform policies and programs for supporting the beginning farmer population.

In relation to the motivations of beginning farmers to start and maintain a farming operation, scholars have suggested that for many beginning farmers, "their vision of what it means to farm is much closer to the agroecological and community paradigm of food production than the industrial commodity system of the past half century has been" (Kirschenmann, 2010, p. 87). Indeed, it has been shown that many beginning farmers are interested in agroecological production and motivated by non-monetary reasons such as the pursuit of farming as a lifestyle and the support of a sustainable food system (Ahearn & Newton, 2009; Bruce,

2019; Iles et al., 2020, 2021; Nelson & Stock, 2018). Thus, beginning farmers' production systems often center diversified, direct-to-consumer production such as fruit and vegetables rather than commodity crops (Ahrean & Newton, 2009; Jablonski et al., 2017). For example, Mariola et al. (2022) found that beginning farmers in Ohio were largely interested in beef cattle, poultry, hay, and vegetables rather than commodity row crops such as corn and soybean. The U.S. Census of Agriculture also showed that in comparison to more established farmers, beginning producers are less likely to produce oilseed and grain and more likely to produce specialty crops such as vegetables, fruits, tree nuts, berries, and greenhouse, nursery, and floriculture production (USDA NASS, 2019).

Increasingly, scholars have recognized the social motivations of beginning farmers. In a study from Ohio, Bruce (2019) identified two types of beginning farmers engaged in alternative agriculture: "greenhorn farmers" are "first-generation farmers with no family connection to agriculture" (p. 33), and "returning farmers" have not relied on farming as their livelihood but have some agricultural background and are returning to the land to become a farmer, often later in life. Both types of beginning farmers are motivated by the idea of farming promoting the health and well-being of their families (Bruce, 2019). Several scholars have also documented that many beginning farmers started small-scale farming to fulfill personal goals of making the food systems more equitable and environmentally friendly and making themselves and their families more autonomous and less reliant on traditional food systems (Bruce, 2019; Iles et al., 2020; Nelson & Stock, 2018). However, little work has linked beginning farmers' social motivations to the unique challenges and needs of this population.

There has also been an emerging focus on engaging military veterans in farming. Specifically, the 2017 Census of Agriculture revealed that 11% of all U.S. agricultural producers had served or were serving in the U.S. military (USDA NASS, 2019). Involvement in agriculture may support mental and physical rehabilitation among military veterans (Besterman-Dahan et al., 2018) and promote their reintegration into families and communities (Donoghue et al., 2014). Governmental and non-gov-

ernmental programs have been increasing their efforts to help interested military veterans enter farming (Farmer Veteran Coalition, 2016). Little research has been done to document and discuss this movement in the academic literature; thus, further work is needed to understand veterans' involvement in agriculture and provide them with relevant support (Iles et al., 2021). For example, the 2017 U.S. Census of Agriculture revealed that the average age of agricultural producers with military service experience is 67.9, a decade older than the average of all farmers (USDA NASS, 2019), but many veteran-focused agricultural programs appear to target younger veterans from recent deployments (i.e., Armed to Farm, AgrAbility, Farmer Veteran Coalition).

Thus far, there has been a significant body of qualitative and, to a certain extent, quantitative research on beginning farmers in the U.S. The qualitative studies have illustrated the diverse motivations, values, and experiences of beginning farmers, with a particular focus on those who operate small- or medium-scale farms (e.g., Bruce, 2019; Calo, 2018; Iles et al., 2020, 2021; Ngo & Brklacich, 2014). The quantitative studies have mostly focused on the financial characteristics of beginning farmers and the associated financial and resource challenges they face to enter farming or to sustain their operation (e.g., Jablonski et al., 2017; Jablonski et al., 2022; Katchova & Ahearn, 2017). Limited work has been done to quantify the characteristics of this population beyond their financial conditions, such as their socially oriented values, needs, and challenges. Even less work has been done to focus on small- and medium-scale beginning farmers, who make up the majority of the beginning farmer population in the U.S. (USDA NASS, 2019).

In this paper, we examined the following research questions: 1) What are the characteristics of small- and medium-scale beginning farmers and their current or intended future farming systems? 2) How do small- and medium-scale beginning farmers make farming decisions and access information about farming? 3) And, what are the motivations, challenges, and needs of small- and medium-scale beginning farmers in terms of starting and sustaining a farm? We assessed these questions

across several beginning farmer socioeconomic characteristics to inform a nuanced understanding of similarities and differences across different types of beginning farmers, rather than treating them as a homogenous group. We also intentionally solicited information from beginning farmers on both the challenges (i.e., difficulties) they face and the needs they have (i.e., the support farmers would like to access in order to address the challenges they face). We believe it is important to assess both challenges and needs in order to inform future policies and programs so that not only will the specific challenges facing beginning farmers be addressed, but they will be addressed in a way that is aligned with how beginning farmers manage their farming operations and the various needs on a day-to-day and long-term basis. For instance, agricultural extension services, or other support structures could respond to the same challenge in many ways, but asking farmers to identify their needs would inform nuanced programming responses that better support this group of producers.

Methods

We collected data through a statewide survey of beginning farmers (see Appendix 1 for the survey questionnaire). Before developing the survey questionnaire, we conducted in-person, semi-structured interviews with 11 beginning farmers in Indiana to gain a preliminary understanding of their characteristics, motivations to farm, and challenges and opportunities regarding their farming business. Results from these qualitative interviews were used to inform the development of the survey, which contained 39 questions covering the following topics: (1) farming background, (2) current farming and marketing practices, (3) perceptions of farmer identity, (4) access to information and resources, (5) challenges and needs related to starting and sustaining a small-scale farm, and (6) demographic characteristics. The study was approved by Purdue University's Institutional Review Board.

Drawing a random sample from a comprehensive sampling frame of small- and medium-scale beginning farmers in Indiana was not possible due to the lack of a full list of beginning farmers in Indiana. Thus, we constructed our own database of small- and medium-scale beginning farmers in the

state that met our inclusion criteria based on our research questions (Ritchie et al. 2013). Specifically, our criteria included: (1) individuals who had been farming for 10 years or less and who were operating 250 acres of land or less in Indiana (i.e., current farmers) or (2) individuals who were planning and just about to start a small- or medium-scale farm in Indiana (i.e., prospective farmers). The 10-year limit was chosen because USDA defines a beginning farmer as an individual with 10 or fewer years of agricultural experience (USDA NASS, 2020). The 250-acre limit was chosen because the average farm size in Indiana was 255 acres in 2015 (USDA NASS, 2016).

To develop a list of potential survey participants, we used several sources: (1) the Local Harvest National Directory, an online forum for farmers to advertise their products and services; (2) contacts from the Indiana Local Growers Guild, a collaborative group of farmers and advocates of local food; (3) the Indiana Small Farm Conference registrant database; and (4) the database of participants in an USDA-funded beginning farmer extension project at Purdue University. After conducting a preliminary assessment of online information for each farm, we removed established farms (those with more than 10 years of experience; USDA NASS, 2020) and duplicate and erroneous entries. This led to a list of 465 beginning farm contacts. From May to July 2016, we administered an online survey via Qualtrics to these beginning farm contacts following the Tailored Design Method (Dillman et al., 2014). Specifically, we sent out a survey link via email with an accompanying cover letter explaining the purpose of our survey and inviting beginning farmer participation. This initial contact was followed by a total of three reminder emails.

In addition, we recruited survey participants using two other methods. First, we provided an open link to the survey to Purdue University Extension educators and invited them to share the link with beginning farmers in their county through their email listservs and social media sites. Second, we administered a paper version of the survey in multiple extension events, including the 2016 Indiana Small Farm Conference and several regional beginning farmer conferences organized by Purdue University Extension during the summer of 2016

to reach beginning farmers who might not have a strong online presence and might not have been reached through direct email invitations. From the 465 direct email invitations, we received 147 complete responses. We received 80 complete responses from the open link to the online survey shared by extension educators and 89 complete survey responses from the 2016 Indiana Small Farm Conference and the subsequent regional conferences. Of the total of 316 complete survey responses we received, 93 were removed because participants did not meet our inclusion criteria.

At the end, the total number of usable, complete survey responses included in the analysis was 223. We did not use probabilistic sampling and thus cannot report a response rate for our survey. However, our approach to recruiting survey participants and screening survey responses was comprehensive and effective, allowing us to identify and reach this specific population in the state (Corbin & Strauss, 2008; Neuman, 2010).

We focused our study on the small and medium-sized beginning farmers in Indiana using a descriptive approach because little is known about this population in the state and the broader mid-western region of the U.S. Descriptive research is particularly well-suited for topics with little known information (Knupfer & McLellan, 1996), and such research also provides the necessary foundation for further quantitative inquiries and hypothesis generation (Grimes & Schulz, 2002). In addition to univariate summary statistics, we analyzed survey data using Chi-squared and Fisher's exact tests to examine relationships between categorical variables. Specifically, we examined the relationships between five demographic characteristics of beginning farmers (i.e., age, gender, education, income, and veteran status) with their motivations to farm, needs, and challenges. Motivations, needs, and challenges were assessed using five-point Likert scale questions (e.g., 1 to 5, where 1 is "not important" and 5 is "very important") (Neuman, 2010). All were analyzed as individual variables (i.e., no indices were created). To assess age, we created two categories (those who were 35 years and younger and those who were more than 35 years) according to the USDA definition of young farmers (≤ 35 years of age; USDA NASS, 2019).

Regrouping categories is a common method for handling small counts in categorical data analysis (de Vaus, 2002). We collapsed the variable measuring respondents' levels of education into three categories (no college education, some college education, or bachelor's degree or higher) due to a small number of observations in several original categories. We also collapsed the variable measuring annual household income into two categories (i.e., \$49,999 and below; \$50,000 and above) due to a small number of observations in several original income categories and the fact that the median household income for Indiana was \$50,433 in 2016 (U.S. Census Bureau, 2016). All statistical analyses were conducted in STATA 12.0.

It is important to note that there is rarely an official start date when an individual transitions from planning to operating a small- or medium-scale farm; becoming a farmer is a process instead of a specific action at a singular point in time (Carajon, 2008; Farm Curious, 2010; Strong, 2015). Thus, we refer to both current and prospective farmers in our results and subsequent discussion to capture *all* small- and medium-scale beginning farmers who fall within the USDA classification of beginning farmers, which is an individual with 0 to 10 years of experience.

Results

Characteristics of Small- and Medium-scale Beginning Farmers and Their Farms

As shown in Table 1, 65% of our survey respondents were currently farming with 10 years or less experience (i.e., current farmers), and 35% were individuals who reported they were in the process of starting a farm in Indiana (i.e., prospective farmers). On average, our current farmer respondents had been farming for 3.5 years. The average age of survey respondents was 45 years, with prospective farmers slightly older than current farmers. Nearly half of our respondents were women. The majority of survey respondents had a bachelor's degree or higher level of education (70% for current farmers and 63% for prospective farmers), and 16% of respondents were military veterans or active-duty members (13% of current farmers and 23% of prospective farmers).

Notably, current farmer respondents reported that on average, 13% of their household income was derived from their farm, and 87% was from off-farm work. The average amount of land owned by our respondents was 25.6 acres, and the majority (51%) had purchased their land from someone they did not know, rather than inheriting land from family (10%) or leasing land (16%) from another landowner. When asked about their agricultural background or experience prior to operating their farm in Indiana, current farmer respondents reported the following (not mutually exclusive categories): 32% had grown up on a farm; 32% had family members who owned a farm that they visited while growing up; 35% had been interested in farming and learned about farming and farm life on their own; 25% had worked on a farm as a job or internship; and 19% had no farming background or experience prior to operating their current farm. Thus, it should be noted that some of our respondents grew up on a farm or had family members who farmed, which are contexts that could have shaped their motivations and challenges in different ways than a new farmer without a family farming background.

Finally, the differences between our survey respondents and the beginning farmer characteristics described in the 2017 Census of Agriculture are important to note, particularly in terms of veteran status and income. Data from the 2017 Census of Agriculture shows that the average age of beginning producers in the U.S. was 46.3 years (42.4 years in Indiana), 41% of them were women (39% in Indiana), and 8% were veterans (5% in Indiana), and that 18% of farms operated by beginning producers had an annual income of US\$50,000 or more (24% in Indiana; USDA NASS, 2019). There was no education data available for this population from the Census of Agriculture. In comparison to these statistics, our current farmer respondents were similar in age, but more likely to identify as a woman and more likely to be military veterans or active-duty members (Table 1 in the Results section). Finally, our current farmer respondents were more likely to have a higher annual household income (65% reporting US\$50,000 or more; see Table 1).

Table 1. Sociodemographic and Economic Characteristics of Current Beginning Farmers and Prospective Farmers in Indiana in This Study

	Current farmers (n=146)	Prospective farmers (n=77)
Demographics		
Average age	44 years	47 years
Women	47%	48%
Bachelor's degree	70%	63%
Military veterans or active-duty members	13%	23%
Annual household income of \$50,000 or more	65%	67%
Hispanic	2%	1%
Average % of household income from farming (self-reported)	13%	N/A
Average amount of land farmed	25.6 acres	N/A
Average length of time farming	3.5 years	N/A
Land acquisition (not mutually exclusive)		
Purchased land from someone (not an acquaintance)	51%	N/A
Leased land from another landowner	16%	N/A
Inherited land from family	10%	N/A
Purchased land from family	10%	N/A
Purchased land from acquaintance	6%	N/A
Received land as gift	1%	N/A
Agricultural production		
	Past 12 months	Planned for future
Vegetables	66%	72%
Fruit	36%	51%
Pastured poultry	35%	49%
Organic production	26%	53%
Flowers	26%	38%
Bees	21%	58%
Goats	20%	32%
Permaculture	19%	28%
Corn and soybean	14%	8%
Pastured pigs	14%	22%
Grass-fed beef	13%	26%
Value-added products	12%	27%
Legumes other than soybean	9%	9%
Aquaponics	5%	14%
Grains	4%	12%
Dairy	4%	7%
Hydroponics	3%	18%
Labor (including respondent)		
	Mean (range; std.dev)	
Total number of people working on the farm	1.5 (1–12; 2.16)	N/A
Full-time people working on the farm	0.5 (0–7; 1.29)	N/A
From household	0.6 (0–3; 0.73)	N/A
Outside household	0.2 (0–6; 0.72)	N/A
Part-time people working on the farm	1.0 (0–7; 1.75)	N/A
From household	1.2 (0–6; 1.20)	N/A
Outside household	0.7 (0–9; 1.82)	N/A

Note: N/A indicates that the particular question was not asked to prospective farmers because it was not yet applicable.

Farming, Marketing, and Farm Management Practices

Current farmer respondents reported producing a wide range of products and engagement in various agricultural production practices in the past 12 months (Table 1). Specifically, 66% of current farmers engaged in vegetable production, 36% in fruit production, and 35% in pastured poultry production. The least popular practice was hydroponics (3%), followed by dairy (4%) and grain (4%) production. Relatedly, we asked prospective farmers what they would like to grow or work on in their farm in Indiana (Table 1). The top three products/practices they were interested in were vegetable production (72%), beekeeping (58%), and, more broadly, organic production (53%). Prospective farmers showed more interest in hydroponics (18%) than current farmers but were similarly uninterested in dairy (7%) and grain (12%) production. Both current (14%) and prospective (8%) farmers had little interest in corn and soybean production.

The three marketing strategies our current farmer respondents utilized most often were establishing personal contact with potential customers directly (58%); selling on farm (48%); and selling in a farmers' market (46%). Fewer respondents had sold through a community-supported agriculture (CSA) program (15%), on the side of the road (13%), or by sending flyers and mailers to potential customers to market or sell their products (7%).

In terms of labor, we asked current farmer respondents to report the number of people working on their farm in Indiana (including themselves). We also asked them to indicate whether these people were full-time or part-time and from their household or outside of their household. Overall, respondents reported an average of 1.5 persons working on the farm; however, many relied solely on part-time labor, with an average of 0.5 full-time persons and an average of 1 part-time person working on the farm. It should be noted that we did not ask about the portion of the year each person worked on the farm; that is, some reported labor may work for a few months during the growing season rather than all year.

Decision-making and Information Sources

We also asked current farmer respondents to indi-

cate who makes decisions about their farm operations (not mutually exclusive categories). Overall, 94% of respondents reported themselves as the sole decision-maker or one of the decision-makers about their farming practices and farm operation. Seventy-four percent of current farmer respondents reported making decisions jointly (50% with their spouse, 6% with their children, 4% with their parents, 6% with another family member, and 8% with a business partner who was not a family member).

Survey respondents also identified sources of information about starting, operating, or sustaining a small-scale farm. The most commonly identified sources for all respondents were through their own research on the internet (86%), extension educators in their county or nearby counties (71%), an extension website (70%), farmers they know who started and are operating a small-scale farm (67%), and Indiana Small Farm Conferences or other conferences (67%).

Finally, survey respondents reported the frequency with which they had interacted with or received information from different agencies and organizations since they became a farmer or started planning their farm (Figure 1). Our results show that extension educators were the group with the most contact with beginning farmers (50% of respondents reported contact at least several times a year). This was followed by local, state, or national nonprofit organizations or farmer associations and groups (34% reported contact at least several times a year) and Natural Resources Conservation Service professionals (17% reported contact at least several times a year).

Motivations to Start Farming

Survey respondents were asked to indicate the importance of potential motivations in their decision or consideration to start a farm in Indiana. As shown in Figure 2, the top three motivating factors identified by current farmers were to (1) pursue farming as a lifestyle (88% of current farmer respondents rated it as very important or important); (2) promote environmentally friendly agricultural practices (87%); and (3) support a sustainable food system (86%). As shown in Figure 3, the top motivating factors identified by prospective farmers

Figure 1. Frequency of Beginning Farmer Interactions with Governmental Agencies, Extension Educators, and Private Organizations

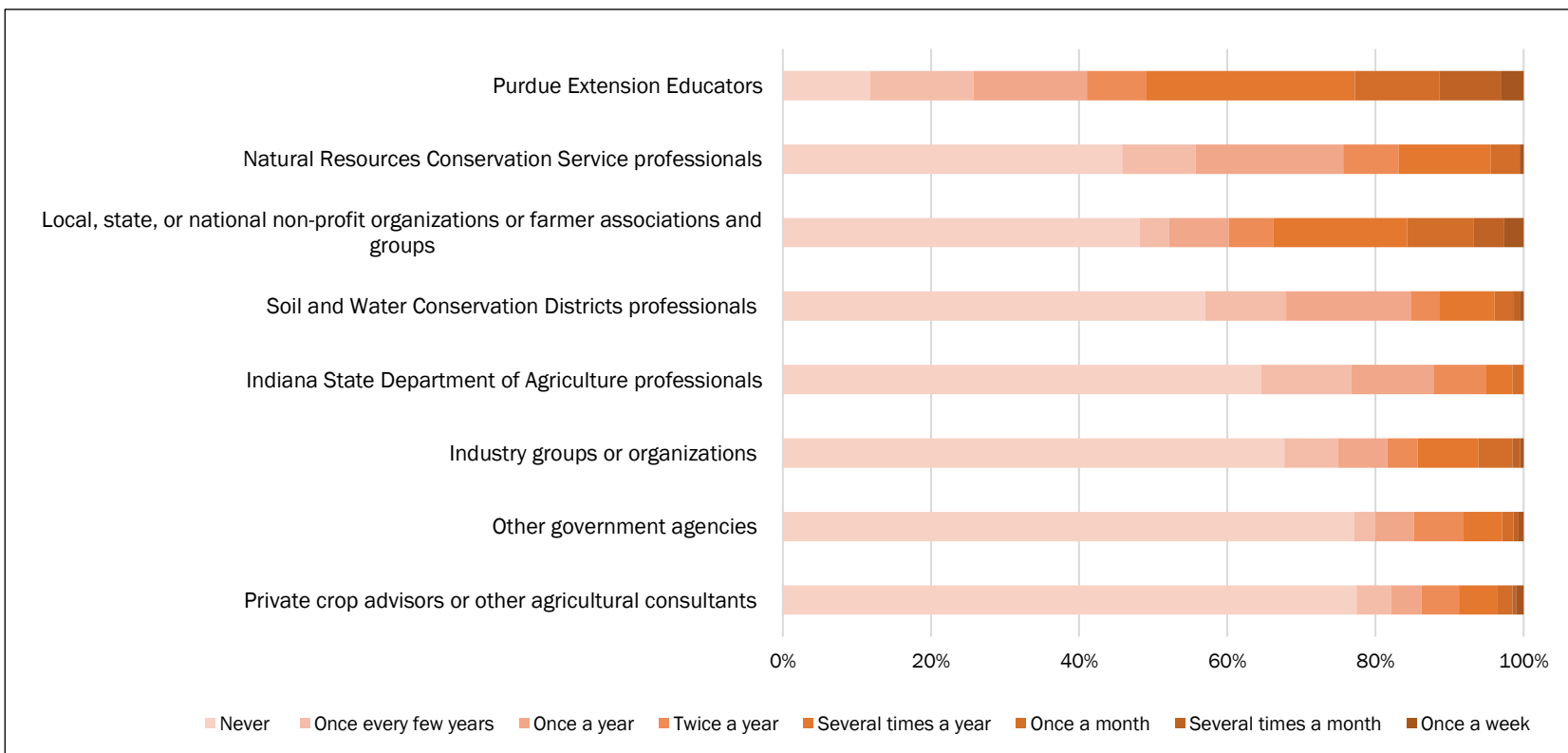


Figure 2. Factors That Motivated Current Farmer Respondents to Start Farming in Indiana, Based on a Survey Question Using a Five-Point Scale

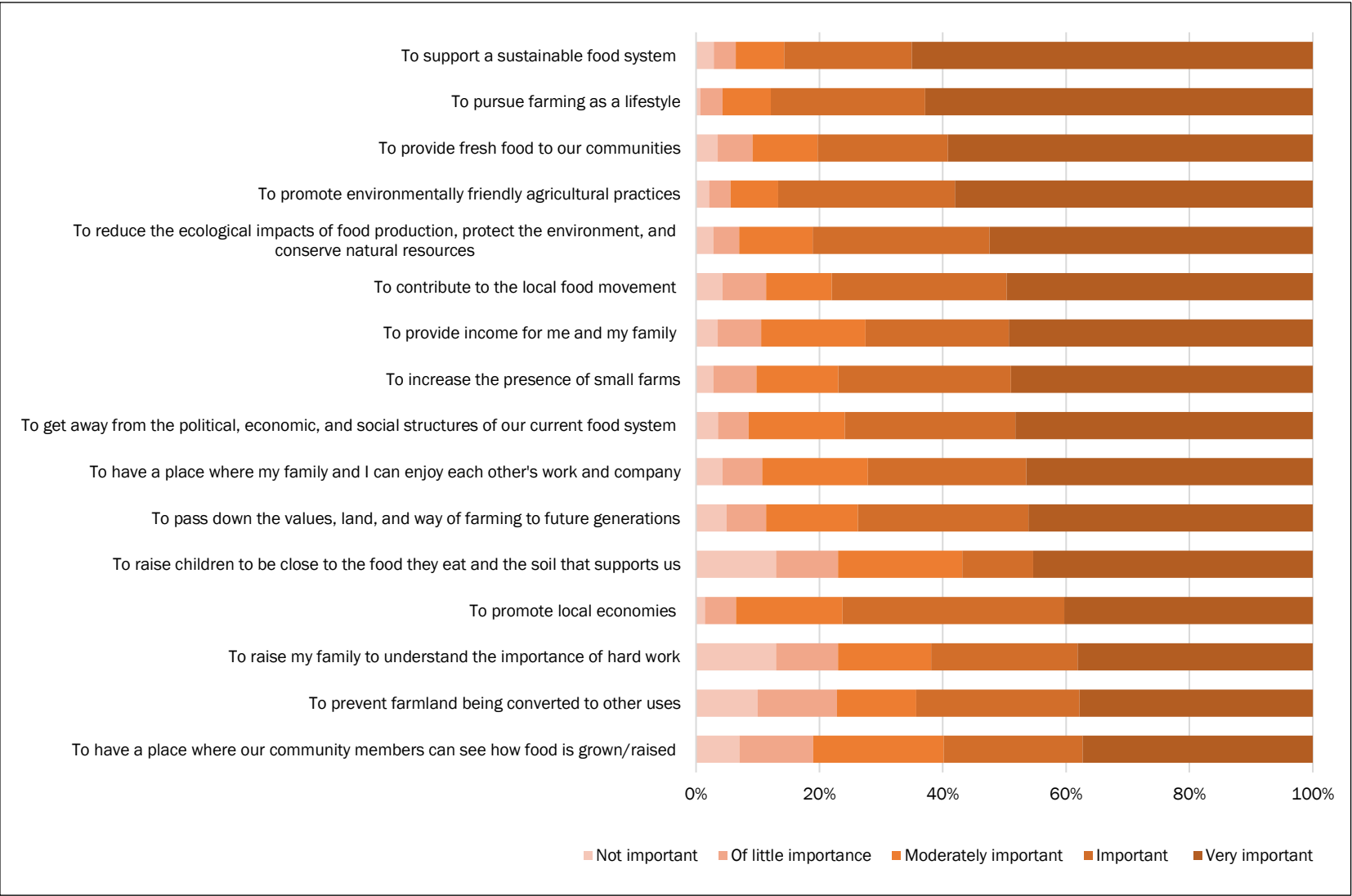
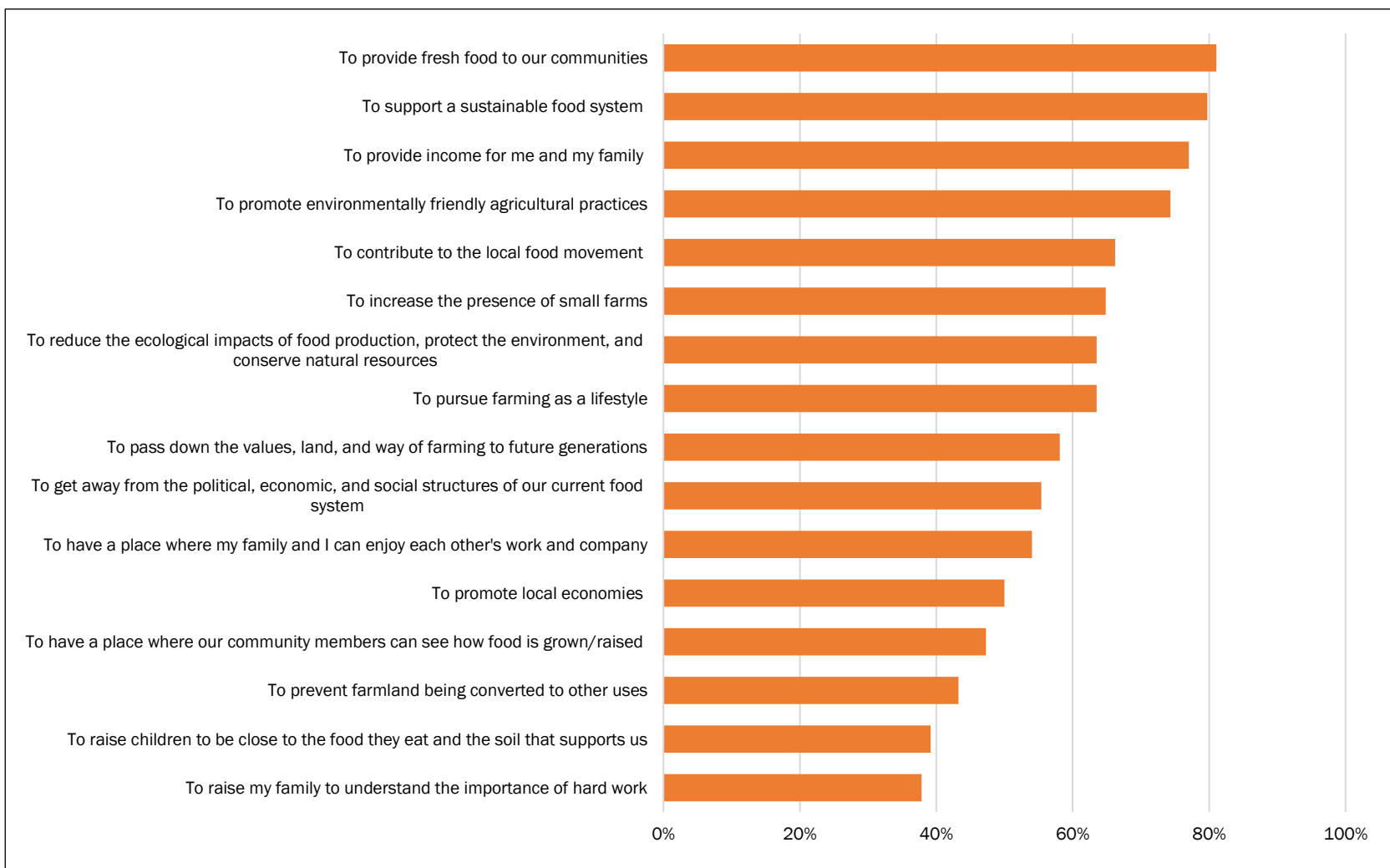


Figure 3. Factors That Are Motivating Prospective Farmer Respondents to Start Farming in Indiana, Based on a “Check All That Apply” Question



were to (1) provide fresh food to their communities (81%); (2) support a sustainable food system (80%); and (3) provide income for themselves and their family (77%). In comparing these motivations across respondent demographics (Table 2), we found that women were more likely than men to be motivated “to support a sustainable food system” (Fisher’s exact test $p=0.04$). In addition, as shown in Table 2, survey respondents with an income of \$49,999 or below were more likely to be motivated “to provide fresh food for their communities” (Fisher’s exact test $p=0.04$).

Challenges Perceived by Small- and Medium-scale Beginning Farmers

Survey respondents identified the challenges they had faced personally in starting, operating, and sustaining a farm in Indiana. Overall, the top three challenges identified by all respondents were having enough time/labor to do what is needed for the farm (65% identified it as a challenge or great challenge); having to balance farming and other jobs for income (55%); and identifying effective marketing strategies (51%). For current farmers, two of these top three challenges were identified, with slightly different percentages of respondents rating each as a challenge or great challenge. Specifically, having enough time/labor to do what is needed for the farm was identified it as a challenge or great challenge by 73% of current farmers, and having to balance farming and other jobs they do for income was identified by 57% of current farmers. In addition, 49% of current farmers also identified obtaining financial resources needed to farm as a challenge or significant challenge. Prospective farmers were challenged by different aspects of starting a farm: 56% reported that identifying effective marketing strategies was a challenge; 54% reported understanding and dealing with zoning regulations and other local and state policies as a challenge; and 53% percent said having to balance farming and other jobs they do for income was a challenge. The least challenging aspects of starting, operating, and sustaining a farm for both current and prospective farmers were getting along with other farmers in their area (9% for both) and understanding the environmental impacts of their farming practices

(11% for current and 14% for prospective farmers).

When comparing challenges across demographics, we found that women were more likely than men to perceive “having enough time/labor to do what is needed for the farm” as a challenge or great challenge for starting, operating and sustaining a farm in Indiana (Fisher’s exact test $p=0.05$). At the same time, men were more likely than women to perceive “identifying effective marketing strategies” as a challenge or great challenge (Fisher’s exact test $p=0.04$). In addition, veterans and active-duty members were less likely than others to perceive “having enough time/labor to do what is needed for the farm” as a challenge or great challenge ($\chi^2=6.991$; $p=0.01$). Education level was also a differentiating factor regarding beginning farmers’ perceiving “balancing farming and other jobs they do for income” as a major challenge. Specifically, those with a bachelor’s degree or higher education were more likely to view it as a challenge than did those without a bachelor’s degree ($\chi^2=6.039$; $p=0.04$).

In the comparison of current and prospective farmers, prospective farmers were more likely to identify “understanding and dealing with zoning regulations and other local and state policies” as a challenge than current farmers ($\chi^2=9.047$; $p<0.01$). Current farmers were more likely than prospective farmers to perceive “having enough time and labor to do what is needed on the farm” as a challenge ($\chi^2=9.613$; $p<0.01$).

Needs Identified by Small- and Medium-scale Beginning Farmers

Survey respondents also identified factors that were important to help them start, operate, and sustain a farm in Indiana (Figure 4). Overall, the top three factors identified by all respondents as important or very important were feeling supported by (potential) customers (88% rated it as important or very important); being able to access pertinent technical and informational resources (86%); and being able to talk to and learn from other farmers (85%). It is worth noting that current farmers identified the same top three factors as prospective farmers, with slightly different percentages (87%, 84%, and 82%, respectively). Similarly,

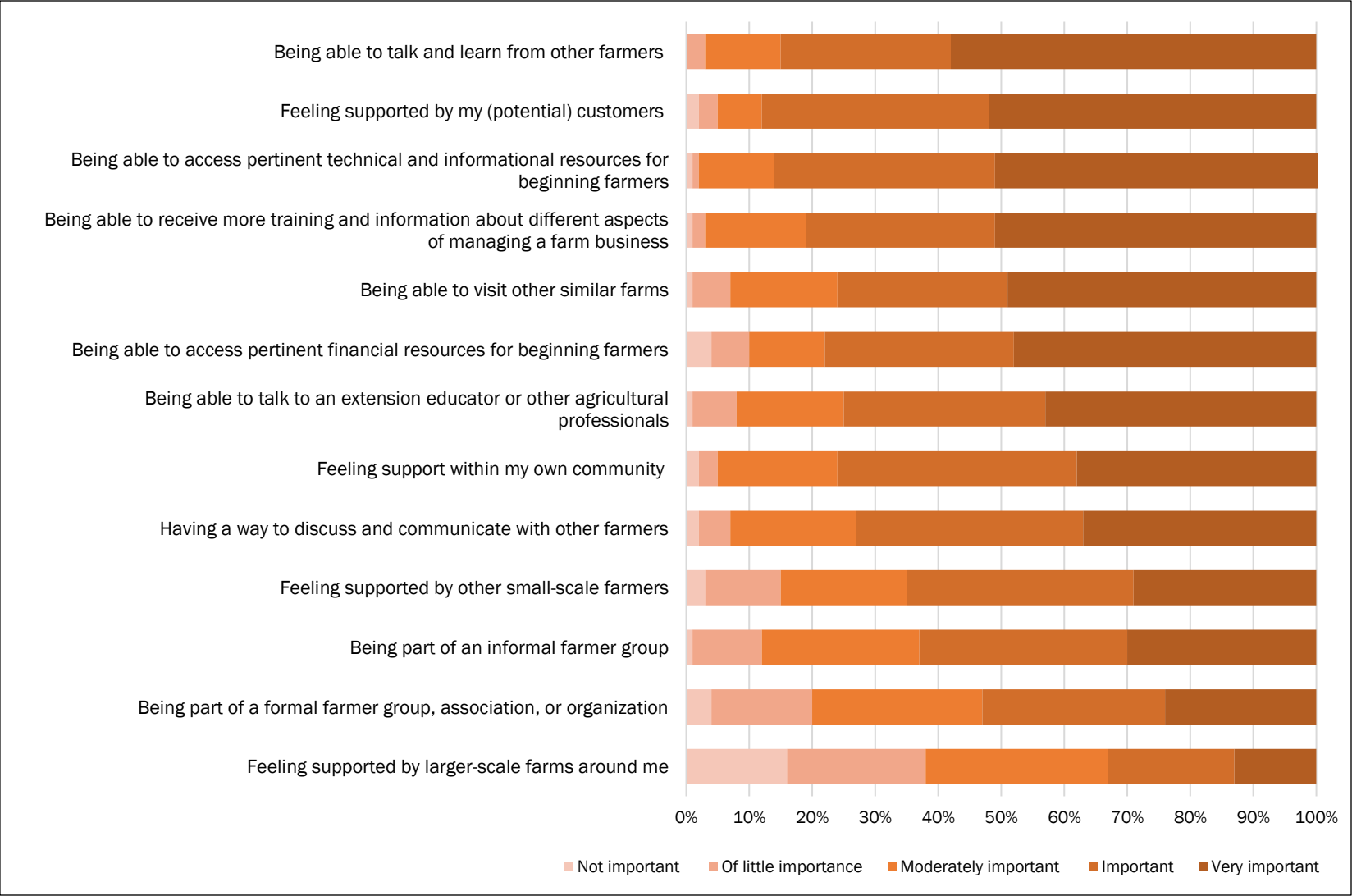
Table 2. Relationships Between New and Beginning Farmer Characteristics and their Motivations, Needs, and Challenges

	Age		Gender		Education			Income		Military status		Farming status	
	35 years & younger	36 years & older	Men	Women	No college	Some college	Bachelor's or higher	US\$49,999 & below	US\$50,000 & above	Veteran / active duty	None	Prospective	Current
Top motivations identified by current farmers													
Pursue farming as a lifestyle	65%	56%	57%	61%	58%	50%	63%	59%	59%	41%	62%	NA	NA
Promote environmentally friendly agricultural practices	65%	54%	59%	62%	58%	54%	63%	63%	59%	47%	62%	NA	NA
Support a sustainable food system	69%	56%	59%*	77%*	50%	54%	60%	63%	54%	50%	58%	NA	NA
Provide fresh food for their communities	79%	88%	87%	80%	63%	76%	86%	93%*	78%*	94%	80%	NA	NA
Top challenges identified by all new and beginning farmers													
Having enough time and labor to do what is needed for the farm	83%	89%	63%*	71%*	83%	80%	88%	88%	83%	45%*	70%*	51%**	73%**
Identifying effective marketing strategies	81%	78%	55%*	46%*	83%	76%*	81%*	81%	78%	58%	49%	56%	47%
Balancing farming and other jobs they do for income	76%	74%	74%	77%	75%	67%*	79%*	76%	75%	42%	59%	53%	57%
Understanding and dealing with zoning regulations and other local and state policies	41%	35%	42%	36%	25%	32%	43%	50%	35%	37%	48%	54%**	32%**
Obtaining financial resources needed to farm	50%	48%	51%	47%	33%	56%	48%	54%	49%	52%	47%	48%	49%
Top needs identified by all new and beginning farmers													
Feeling supported by their (potential) customers	86%	95%	88%	88%	75%	85%	91%	95%	86%	87%	89%	91%	87%
Being able to access pertinent technical and informational resources for beginning farmers	85%	87%	83%	87%	75%	83%	89%	87%	86%	84%	86%	89%	84%
Being able to talk to and learn from other farmers	78%*	95%*	79%	88%	67%	85%	86%	89%	81%	78%	85%	88%	82%
Being able to receive more training and information about different aspects of managing a farm business	80%	84%	87%	75%	83%	73%	84%	83%	81%	81%	81%	85%	78%

* $p < 0.05$ ** $p < 0.001$ **Fisher's exact test (bold)*****Chi-squared test (bold italics)***

Note: We compared the top three motivations, needs, and challenges identified by all our beginning farmer respondents, as well as the ones identified as the top three motivations, needs, and challenges by only the current or prospective farmer respondents. Most of these items did overlap, but some did not. As such, this table includes more than three motivations, needs, and challenges.

Figure 4. Needs Identified by All Farmers to Help Them Start, Operate, and Sustain a Farm in Indiana, Based on a Survey Question Using a Five-Point Scale



89% of prospective farmers identified being able to access pertinent technical and informational resources for beginning farmers as a top factor, and 91% identified feeling supported by their (potential) customers. In addition, being able to receive more training and information about different aspects of managing a farm business was also considered important or very important by 85% of prospective farmer respondents. The least important factors for both current and prospective farmers were being part of a formal farmer group, association, or organization (55% and 41% respectively) and feeling supported by larger-scale farmers around them (35% and 26% respectively). The only differentiating factor in the needs identified by beginning farmers was the age of the respondents. Specifically, those who were 36 years or older were more likely to identify “being able to talk to and learn from other farmers” as an important need for starting, operating, and sustaining a farm relative to younger farmers (Fisher’s exact test $p=0.01$).

Discussion

Production Interests and Motivations for Farming

Previous studies have suggested that many beginning farmers are interested in agroecological production and motivated by nonmonetary reasons (Ahearn & Newton, 2009; Bessant, 2008; Bruce, 2019; Iles et al., 2020; Iles et al., 2021; Isleib, 2013; Nelson & Stock, 2018). Indeed, in our study, corn and soybean, the two crops that make up 36% and 40%, respectively, of farmed acres in Indiana (USDA NASS, 2019), were the least commonly produced among current beginning farmers in our system. Likewise, prospective farmers showed little interest in these crops. Instead, beginning farmers in our study were most interested in vegetable and fruit production. This is consistent with what is grown by more established small- or medium-scale farmers in Indiana and in the U.S. more broadly. Relatedly, the most important motivation for current farmers to start, operate, and maintain a farm in Indiana was to pursue farming as a lifestyle, followed by supporting a sustainable food system and promoting environmentally friendly agricultural practices, which are very much aligned with the

agroecological production paradigm (Bruce, 2019; Iles et al., 2020; Iles et al., 2021; Kirschenmann, 2010).

Reliance on Pluriactivity

Our study also highlights small- and medium-scale beginning farmers’ reliance on pluriactivity, or holding multiple jobs, to sustain their farming operations and the constant challenges they face in balancing farming and other jobs. This reliance on pluriactivity and the associated challenges are not unique to beginning farmers in Indiana but affirm trends found elsewhere in North America (e.g., Bessant, 2008; Bruce, 2019), as well as well-documented livelihood diversification prevalent in the process of repeasantization (Nelson & Stock, 2018). Previous literature has argued that the need for pluriactivity may decrease as farming operations grow (Thilmany & Ahearn, 2013). Thus, “industry participants must not overlook the importance of off-farm income in transitioning a young and beginning farmer’s operation” (Bubela, 2016, p. 6). Whether pluriactivity truly decreases over time is a topic for further research. However, it cannot be assumed that reliance on pluriactivity is transitional. Anecdotally, several beginning farmers told our research team that they or their spouse maintain an off-farm job to not only supplement their income but also gain access to health insurance. This echoes findings from Inwood et al. (2017) and Becot (2020) that showed that farmers were similarly motivated to keep off-farm employment to maintain access to health insurance. This further demonstrates the ongoing importance of pluriactivity in supporting small- and medium-scale beginning farmers even as their farms become more established over time. Pluriactivity may also help account for our respondents’ higher overall incomes. Additionally, it is important to note that some beginning farmers may not want to farm full-time without other employment. Rather, previous research has shown that a portion of beginning farmers aim to remain part-time and, in some cases, do not seek to make a profit from their production (Song et al., 2022; Sutherland et al., 2019). Thus, agricultural extension services and other support infrastructure should consider how to support begin-

ning farmers with a variety of profit and employment goals.

Pluriactivity is also connected with another important challenge facing beginning farmers in our study and more broadly—farm labor. Over a third of our respondents relied on full-time or part-time farm labor from outside their household. At the same time, many of these farmers had off-farm jobs. This is a conundrum facing many beginning farmers—working off-farm offers crucial opportunities to manage risks associated with transitioning into agriculture (Bubela, 2016); yet it also equates to less time available for farming-related work (Suryanata et al., 2021). As noted above, full-time farming may not be the goal for all beginning farmers. Nevertheless, the lack of sufficient time to invest in on-farm labor as well as the direct marketing work that is necessary for generating sufficient sales was a repeated challenge for many beginning farmers (Iles et al., 2021). Beginning farmers often pursue diversified agricultural production and environmentally friendly farming practices that may require higher labor inputs (Kremen et al., 2012). This diversity in production systems, coupled with their relatively small farm sizes, may require more manual labor (and consequently time), as technology commonly used on larger monoculture farms may not be appropriate for these beginning farmers (Bruce & Castellano, 2017; Kremen et al., 2012). This is exacerbated by the documented challenge of finding and affording reliable labor for small-scale farmers more broadly (Brown & Miller, 2008; Bruce & Castellano, 2017; MacAuley & Niewolny, 2015). In short, labor- and time-intensive production systems coupled with off-farm job responsibilities can pose significant challenges for small- and medium-scale beginning farmers to maintain their operations.

Differentiated Perceptions of Time Constraints

Interestingly, time constraints were perceived differently by groups of beginning farmers in our study. For example, in our study, women were more likely to perceive the challenge of time and labor than men. Indeed, it has been shown that women are more likely to retain domestic responsibilities in addition to on-farm labor (Allen & Sachs, 2007; Sachs et al., 2016) and that balancing these

demanding responsibilities is a major stress for women farmers (Shisler & Sbicca, 2019). Currently, close to half of the beginning farmers in the U.S. are women (Fremstad & Paul, 2020; USDA NASS, 2019). Our findings point to the need for targeted support that mitigates time-related challenges and further research to better understand the reasons women farmers were challenged by time constraints.

At the same time, women in our study were less likely than men to identify challenges related to marketing and were more likely to be motivated to support a sustainable food system. This echoes previous work showing that women oftentimes think of farming as a way to nourish themselves and care for their community (Jarosz, 2011) and tend to perform predominately feminine-coded work, including customer support (Shisler & Sbicca, 2019). While many studies have been conducted in the Global South to look at the role of women and men within farming households, relatively limited knowledge exists in the Global North about women's domestic, productive, and community labor responsibilities (Ball, 2020; Brandth, 2002; Meares, 1997; Trauger et al., 2010). Our study points out the need to further examine gendered intra-farm dynamics in the U.S., where the number of women who farm continues to grow (Fremstad & Paul, 2020; USDA NASS, 2019).

Veterans or active-duty members in our study also perceived time constraints differently. Specifically, military beginning farmers were less likely to view time as a significant challenge than their non-military counterparts. This could be an extension of the gendered difference, as a large majority of the military beginning farmers were men. However, it has also been suggested that veterans' skills may be particularly suited to agriculture (Donoghue et al., 2014), so they may perceive challenges differently than non-military beginning farmers. Furthermore, military beginning farmers may have a pension from their service that supplements their agricultural income and access to some healthcare services, which could reduce their need for off-farm employment. So far, little research has been done to understand how beginning farmers with military backgrounds engage in agriculture. More

information is needed, especially as federal and state programs for beginning farmers continue to target veterans (Donoghue et al., 2014; Fleming, 2015).

Finally, beginning farmers with higher education were also more likely to identify time constraints as a challenge. This could potentially be attributed to the prevalence of off-farm work among those with advanced degrees. Other research has shown that farmers with higher levels of education were more likely to farm part-time than those with lower levels of education, in part due to their access to higher-paying off-farm work (Jansuwan & Zander, 2022). As such, full-time on-farm work would have a higher opportunity cost for those with advanced degrees than those without. Further research is needed to better understand this dynamic related to the challenges of time and risk management across different segments of small- and medium-scale beginning farmers.

Land Access

In addition to time constraints, land access has been touted as a critical barrier to entering agriculture for new farmers (Ahearn, 2011; Calo & De Master, 2016; Horst & Gwin, 2018; Katchova & Ahearn, 2016). However, in our study, land access was not ranked among the top challenges faced by small- and medium-scale beginning farmers in Indiana. In fact, less than 20% of our respondents leased land to farm from other landowners, while the rest were the primary owners of their farmland. The land they owned had most often been purchased from someone they did not know (rather than a family member or friend), suggesting our respondents' ability to acquire land with their financial rather than social capital. While this phenomenon requires additional research, it may be explained by the fact that our respondents had relatively high incomes, supported by their reliance on pluriactivity and higher education level, and were operating small- and medium-scale farms. Moreover, the majority of beginning farmers in our study were over the age of 35, and many were veterans or active-duty members. Thus, these individuals may have resources that younger farmers do not have to help them access land.

Access to Information and Social Support

Previous research has demonstrated that the social aspects of farming, such as connecting with peers and feeling supported by customers, have important implications for long-term farm sustainability and farmer decision-making (Iles et al., 2020; Jarosz, 2012; Källström & Ljung, 2009). While small- and medium-scale beginning farmers in our study emphasized the need for social support and relationships, connecting to other farmers was not a primary challenge, and these respondents were reluctant to engage in a formal farmer group, association, or organization. This is unsurprising because our results also revealed that small- and medium-scale beginning farmers tended to research information about starting, operating, or sustaining a small-scale farm on the internet. This may reflect the time constraints many beginning farmers face, as finding information online may be considered more efficient than participating in a formal group. With a majority of small- and medium-scale beginning farmers mostly relying on their own research on the Internet, efforts are needed to ensure that scientifically based information and professional advice are easily searchable, readily accessible (in terms of understandability), and engaging for small- and medium-scale beginning farmers.

Beginning farmers in our study also placed a high importance on the technical and informational resources that are pertinent for addressing their needs and challenges. As argued in many previous studies, current agricultural extension and education programs in the U.S. have been primarily developed to assist larger-scale commodity agriculture and are often ill-suited to address the needs and challenges of small- or medium-scale farmers (Iles et al., 2020; Meyer et al., 2011). Many extension educators may lack the capacity to assist beginning farmers, who tend to engage in diversified, small- or medium-scale agricultural systems. Beginning farmers' technical needs and the challenges of their production practices, business management, and marketing can be quite different from those of the traditional extension clientele of larger-scale commodity producers (Iles et al., 2021). For example, identifying effective direct-marketing strategies was ranked as one of the top challenges facing beginning farmers in our study. However, intrapersonal

communication, relationship-building, and the application of these skills to direct marketing are seldom the focus of extension-led agricultural outreach programs.

Furthermore, there has been some evidence suggesting that younger generations of small- and medium-scale farmers may have less trust in formal institutions such as extension programs than their older counterparts (Feola et al., 2015; Iles et al., 2020). Although attending extension workshops or events may still be important in the foreseeable future, many small- or medium-scale beginning farmers in our study expressed the desire for independent learning. Nevertheless, interactions with other farmers and visiting farms like theirs were key sources of information to beginning farmers in our study. Thus, Extension and other outreach programs should consider ways to target support systems that match small- or medium-scale beginning farmers' ways of acquiring information. It should be noted that the majority of beginning farmers in our study did interact with extension programs to some degree. This may be due in part to the recruiting efforts we used in this study; however, further research could target beginning farmers who have had less exposure to extension programs or examine the beginning farmers' perceptions toward their past and ongoing interactions with extension offices and agents. For instance, Purdue Extension in Indiana has multiple programs dedicated to beginning farmers. It would be beneficial to assess how beginning farmers perceive this programming to better understand how to improve current support systems to address the challenges and needs of this population.

Further Research and Limitations

Some researchers have cautioned against depicting beginning farmers as "young, well-educated individuals, operating smaller farms with a positive value of farm production, perhaps with access to farmland through relatives," as in the 2009 USDA Agricultural Resource Management Survey (Ahearn, 2011). However, beginning farmers in our study were indeed younger and more educated than the established farmer population, and most of them had purchased land from someone they did not know. These demographics may be due to

changes in the beginning farmer population over the last decade, but it also suggests there is still a lot to be learned about the 27% of agricultural producers in the U.S. who have been classified as beginning producers (USDA NASS, 2019).

Finally, we want to note that our sampling frame for the survey was limited by the lack of a complete database of beginning farmers in the state. Although our comprehensive recruitment efforts reduced such limitation, we observed two potential biases. First, there was an overrepresentation of veteran respondents in our survey. One of our four sources for contacts that we used to construct our sampling frame was a database of participants in a USDA-funded beginning farmer extension project, which has an outreach component targeting veterans who want to start a farm. Second, our sampling strategy made it easier to include farmers with a stronger online presence or those who attended the conference at which we sampled. As such, our study highlights a need to identify more effective strategies to reach and engage with beginning farmers without an online presence or those who are less integrated into existing extension programming.

Conclusion

In Indiana and other places in the midwestern U.S., the farmer population mostly consists of experienced yet aging individuals operating large-scale commodity cropping systems (USDA NASS, 2019). Changes in the current agricultural systems, coupled with a growing public interest in local and sustainable food systems, have contributed to a growing population of beginning farmers (Hinrichs, 2000; Iles et al., 2021; Trauger et al., 2010). Our study shows that small- and medium-scale beginning farmers in Indiana were primarily operating, or interested in operating, diversified agriculture and were motivated to support local, environmentally friendly, sustainable food systems. They relied heavily on pluriactivity and were challenged to balance on-farm and off-farm responsibilities, access labor, and identify marketing strategies. In addition, these beginning farmers were more interested in connecting with other farmers and visiting similar farms than being part of formal farmer organizations. These results contribute to a

greater understanding of small- and medium-scale beginning farmers' motivations, challenges, and needs associated with starting and sustaining a farm. These results can also be used to inform agricultural professionals and organizations in their efforts to tailor technical assistance, outreach, and other programming to better align with beginning farmers' motivations and to address their unique needs and challenges.

Our study also highlights additional areas of research. For example, future studies could assess the gendered division of labor in terms of day-to-day farming activities, caregiving responsibilities, and the navigation of multiple jobs (Ball, 2020). Our study also suggests a need to assess existing extension programming for small- and medium-scale beginning farmers to better understand what type of support structures promote interactions between agricultural extension and this group of producers, particularly in comparison to what has been provided to their larger-scale counterparts. Finally, it is important to note that while there have been programming and policy efforts to support beginning farmers from historically excluded groups, disparities in land ownership, profit, and

access to resources persist (Ball, 2020; Suryanata et al., 2021). Thus, additional work is needed to identify the unique challenges faced by, for example, non-white beginning farmers, to create more equitable agricultural programming and support their role in the social-environmental landscape. Ultimately, it is important to not treat beginning farmers as a homogenous group. Instead, our study has provided important insights on how to develop targeted infrastructure to support small- and medium-scale beginning farmers' livelihoods and address their unique challenges as they start and sustain their farms.

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References

- Ahearn, M. (2011). Potential challenges for beginning farmers and ranchers. *Choices*, 2.
<https://www.choicesmagazine.org/choices-magazine/theme-articles/innovations-to-support-beginning-farmers-and-ranchers/potential-challenges-for-beginning-farmers-and-ranchers>
- Ahearn, M., & Newton, D. (2009). *Beginning farmers and ranchers* (Economic Information Bulletin No. 53). USDA Economic Research Service. https://www.ers.usda.gov/webdocs/publications/44395/9417_eib53_1_.pdf
- Allen, P., & Sachs, C. (2007). Women and food chains: The gendered politics of food. *The International Journal of Sociology of Agriculture and Food*, 15(1), 1–23. <https://doi.org/10.48416/ijisaf.v15i1.424>
- Armbruster, W. J., & Ahearn, M. C. (2014). Changing structure and organization of US agriculture. In N. K. Van Alfen (Ed.), *Encyclopedia of Agriculture and Food Systems* (pp. 201–219). Academic Press.
- Ball, J. A. (2020). Women farmers in developed countries: A literature review. *Agriculture and Human Values*, 37, 147–160. <https://doi.org/10.1007/s10460-019-09978-3>
- Bessant, K. (2008). A farm household conception of pluriactivity in Canadian agriculture: Motivation, diversification, and livelihood. *Canadian Review of Sociology*, 43(1), 51–72. <https://doi.org/10.1111/j.1755-618X.2006.tb00854.x>
- Besterman-Dahan, K., Chavez, M., & Njoh, E. (2018). Rooted in the community: Assessing the reintegration effects of agriculture on rural veterans. *Archives of Physical Medicine and Rehabilitation*, 99(2), S72–S78. <https://doi.org/10.1016/j.apmr.2017.06.035>
- Brandth, B. (2002). Gender identity in European family farming: A literature review. *Sociologia Ruralis*, 42(3), 181–200. <https://doi.org/10.1111/1467-9523.00210>

- Brown, C., & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). *American Journal of Agricultural Economics*, 90(5), 1298–1302.
<https://doi.org/10.1111/j.1467-8276.2008.01220.x>
- Bruce, A. B. (2019). Farm entry and persistence: Three pathways into alternative agriculture in southern Ohio. *Journal of Rural Studies*, 69, 30–40. <https://doi.org/10.1016/j.jrurstud.2019.04.007>
- Bruce, A., & Castellano, R. S. (2017). Labor and alternative food networks: Challenges for farmers and consumers. *Renewable Agriculture and Food Systems*, 32(5), 403–416. <https://doi.org/10.1017/S174217051600034X>
- Bubela, H. J. (2016). Off-farm income: Managing risk in young and beginning farmer households. *Choices*, 31(3), 1–8.
https://www.choicesmagazine.org/UserFiles/file/cmsarticle_523.pdf
- Calo, A. (2018). How knowledge deficit interventions fail to resolve beginning farmer challenges. *Agriculture and Human Values*, 35, 367–381. <https://doi.org/10.1007/s10460-017-9832-6>
- Calo, A., & De Master, K. T. (2016). After the incubator: Factors impeding land access along the path from farmworker to proprietor. *Journal of Agriculture, Food Systems, and Community Development*, 6(2), 111–127.
<https://doi.org/10.5304/jafscd.2016.062.018>
- Carajon. (2008). *When do you have a farm?* [Online forum post]. Houzz.
<https://www.houzz.com/discussions/1428663/when-do-you-have-a-farm>
- Carolan, M. (2018). Lands changing hands: Experiences of succession and farm (knowledge) acquisition among first-generation, multigenerational, and aspiring farmers. *Land Use Policy*, 79, 179–189.
<https://doi.org/10.1016/j.landusepol.2018.08.011>
- Carlisle, L., de Wit, M. M., DeLonge, M. S., Calo, A., Getz, C., Ory, J., Munden-Dixon, K., Galt, R., Melone, B., Knox, R., Iles, A., & Press, D. (2019). Securing the future of US agriculture: The case for investing in new entry sustainable farmers. *Elementa: Science of the Anthropocene*, 7, 17. <https://doi.org/10.1525/elementa.356>
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage Publications.
- de Vaus, D. (2002). *Analyzing social science data: 50 key problems in data analysis*. Sage.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons.
- Donoghue, D. J., Goodwin, H. L., Mays, A. R., Arsi, K., Hale, M., Spencer, T., O’Gorman, M., Jose, S., Gekara, O. J., Burke, J. M., & Donoghue, A. M. (2014). Armed to farm: Developing training programs for military veterans in agriculture. *Journal of Rural Social Sciences*, 29(2), Article 5. <https://egrove.olemiss.edu/jrss/vol29/iss2/5>
- Farm Curious. (2010, November 3). *So you call yourself a farmer?*
<https://www.farmcurious.com/blogs/farmcurious/17598724-so-you-call-yourself-a-farmer>
- Farmer Veteran Coalition. (2016). *2016 annual report*.
<https://www.farmvetco.org/wp-content/uploads/2017/06/FVC-2016-Annual-Report.pdf>
- Feola, G., Lerner, A. M., Jain, M., Montefrio, M. J. F., & Nicholas, K. A. (2015). Researching farmer behaviour in climate change adaptation and sustainable agriculture: Lessons learned from five case studies. *Journal of Rural Studies*, 39, 74–84. <https://doi.org/10.1016/j.jrurstud.2015.03.009>
- Fleming, L. L. (2015). Veteran to farmer programs: An emerging nature-based programming trend. *Journal of Therapeutic Horticulture*, 25(1), 27–48. <https://www.jstor.org/stable/24865257>
- Freedgood, J., Hunger, M., Dempsey, J., & Sorensen, A. (2020). *Farms under threat: The state of the States*. American Farmland Trust. <https://farmlandinfo.org/publications/farms-under-threat-the-state-of-the-states/>
- Fremstad, A., & Paul, M. (2020). Opening the farm gate to women? The gender gap in U.S. agriculture. *Journal of Economic Issues*, 54(1), 124–141. <https://doi.org/10.1080/00213624.2020.1720569>
- Grimes, D. A., & Schulz, K. F. (2002). Descriptive studies: What they can and cannot do. *Lancet*, 359(9301), 145–149.
[https://doi.org/10.1016/S0140-6736\(02\)07373-7](https://doi.org/10.1016/S0140-6736(02)07373-7)
- Hinrichs, C. C. (2000). Embeddedness and local food systems: Notes on two types of direct agricultural market. *Journal of Rural Studies*, 16(3), 295–303. [https://doi.org/10.1016/S0743-0167\(99\)00063-7](https://doi.org/10.1016/S0743-0167(99)00063-7)

- Horst, M., & Gwin, L. (2018). Land access for direct market food farmers in Oregon, USA. *Land Use Policy*, 75, 594–611. <https://doi.org/10.1016/j.landusepol.2018.01.018>
- Iles, K., Ma, Z., & Erwin, A. (2020). Identifying the common ground: Small-scale farmer identity and community. *Journal of Rural Studies*, 78, 25–35. <https://doi.org/10.1016/j.jrurstud.2020.06.018>
- Iles, K., Ma, Z., & Nixon, R. (2021). Multi-dimensional motivations and experiences of small-scale farmers. *Society and Natural Resources*, 34(3), 352–372. <https://doi.org/10.1080/08941920.2020.1823540>
- Isleib, J. (2013, July 31). *What motivates beginning farmers?* Michigan State University Extension. https://www.canr.msu.edu/news/what_motivates_beginning_farmers.
- Jablonski, B. B. R., Key, N., Hadrich, J., Bauman, A., Campbell, S., Thilmany, D., & Sullins, M. (2022). Opportunities to support beginning farmers and ranchers in the 2023 Farm Bill. *Applied Economic Perspectives and Policy*, 44(3), 1177–1194. <https://doi.org/10.1002/aep.13256>
- Jablonski, B. B. R., Thilmany McFadden, D., Sullins, M., & Curtis, K. R. (2017). Determinants of effective beginning farmer programming and implications for future programs. *Journal of Agricultural and Resource Economics*, 42(3), 427–438. <https://www.jstor.org/stable/44840965>
- Jansuwan, P., & Zander, K. K. (2022). Multifunctional farming as successful pathway for the next generation of Thai farmers. *PLoS ONE*, 17(4), Article e0267351. <https://doi.org/10.1371/journal.pone.0267351>
- Jarosz, L. (2011). Nourishing women: Toward a feminist political ecology of community supported agriculture in the United States. *Gender, Place & Culture*, 18(3), 307–326. <https://doi.org/10.1080/0966369X.2011.565871>
- Jarosz, L. (2012). Understanding agri-food networks as social relations. *Agriculture and Human Values*, 17, 279–283. <https://doi.org/10.1023/A:1007692303118>
- Jöhr, H. (2012). Where are the future farmers to grow our food? *International Food and Agribusiness Management Review*, 15(A), 9–11. <https://ageconsearch.umn.edu/record/129168/>
- Källström, H. N., & Ljung, M. (2009). Social sustainability and collaborative learning. *Ambio*, 34(4), 376–382. <https://doi.org/10.1579/0044-7447-34.4.376>
- Katchova, A. L., & Ahearn, M. C. (2016). Dynamics of farmland ownership and leasing: implications for young and beginning farmers. *Applied Economic Perspectives and Policy*, 38(2), 334–350. <https://www.jstor.org/stable/44788092>
- Katchova, A. L., & Ahearn, M. C. (2017). Farm entry and exit from US agriculture. *Agricultural Finance Review*, 77(1), 50–63. <https://doi.org/10.1108/AFR-03-2016-0021>
- Kinsella, J., Wilson, S., De Jong, F., & Renting, H. (2000). Pluriactivity as a livelihood strategy in Irish farm households and its role in rural development. *Sociologia Ruralis*, 40(4), 481–496. <https://doi.org/10.1111/1467-9523.00162>
- Kirschenmann, F. (2010). Alternative agriculture in an energy- and resource-depleting future. *Renewable Agriculture and Food Systems*, 25(2), 85–89. <https://doi.org/10.1017/S1742170510000141>
- Knupfer, N. N., & McLellan, H. (1996). Descriptive research for educational communications and technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 1196–1212). Routledge.
- Kremen, C., Iles, A., & Bacon, C. (2012). Diversified farming systems: An agroecological, systems-based alternative to modern industrial agriculture. *Ecology and Society*, 17(4), Article 44. <https://doi.org/10.5751/ES-05103-170444>
- Lobley, M., Baker, J. R., & Whitehead, I. (2010). Farm succession and retirement: Some international comparisons. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), 49–64. <https://doi.org/10.5304/jafscd.2010.011.009>
- MacAuley, L. E., & Niewolny, K. L. (2015). Situating on-farm apprenticeships within the alternative agrifood movement: Labor and social justice implications. *Journal of Agriculture, Food, Systems, and Community Development*, 6(2), 195–223. <https://doi.org/10.5304/jafscd.2016.062.024>
- Mariola, M. J., Schwieterman, A., & Desonier-Lewis, G. (2022). What do local foods consumers want? Lessons from ten years at a local foods market. *Journal of Agriculture, Food Systems, and Community Development*, 11(3), 211–227. <https://doi.org/10.5304/jafscd.2022.113.011>

- Meares, A. C. (1997). Making the transition from conventional to sustainable agriculture: Gender, social movement participation, and quality of life on the family farm. *Rural Sociology*, 62(1), 21–47.
<https://doi.org/10.1111/j.1549-0831.1997.tb00643.x>
- Meyer, L., Hunter, J., Katchova, A., Lovett, S., Thilmany, D., Sullins, M., & Card, A. (2011). Approaching beginning farmers as a new stakeholder for Extension. *Choices: The Magazine of Food, Farm, and Resource Issues*, 26(2).
<https://www.choicesmagazine.org/choices-magazine/theme-articles/innovations-to-support-beginning-farmers-and-ranchers/approaching-beginning-farmers-as-a-new-stakeholder-for-extension>
- Nelson, J., & Stock, P. (2018). Repeasantisation in the United States. *Sociologia Ruralis*, 58(1), 83–103.
<https://doi.org/10.1111/soru.12132>
- Neuman, W. L. (2010). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Pearson.
- Ngo, M., & Brklacich, M. (2014). New farmers' efforts to create a sense of place in rural communities: Insights from southern Ontario, Canada. *Agriculture and Human Values*, 31, 53–67. <https://doi.org/10.1007/s10460-013-9447-5>
- Niewolny, K. L., & Lillard, P. T. (2010). Expanding the boundaries of beginning farmer training and program development: A review of contemporary initiatives to cultivate a new generation of American farmers. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), 65–88. <https://doi.org/10.5304/jafscd.2010.011.010>
- Ritchie, J., Lewis, J., Nicholls, C.M., Ormston, R. (Eds.). (2013). *Qualitative research practice: A guide for social science students and researchers* (2nd ed.). Sage Publications.
- Rosenberg, N. A. (2017). Farmers who don't farm: The curious rise of the zero-sales farmer. *Journal of Agriculture, Food Systems, and Community Development*, 7(4), 149–157. <https://doi.org/10.5304/jafscd.2017.074.005>
- Sachs, C. E., Barbercheck, M. E., Braiser, K. J., Kiernan, N. E., & Terman, A. R. (2016). *The rise of women farmers and sustainable agriculture*. University of Iowa Press. <https://doi.org/10.2307/j.ctt20p57gr>
- Shisler, R. C., & Sbicca, J. (2019). Agriculture as carework: The contradictions of performing femininity in a male-dominated occupation. *Society & Natural Resources*, 32(8), 875–892. <https://doi.org/10.1080/08941920.2019.1597234>
- Song, B., Robinson, G. M., & Bardsley, D. K. (2022). Hobby and part-time farmers in a multifunctional landscape: Environmentalism, lifestyles, and amenity. *Geographical Research*, 60(3), 480–497.
<https://doi.org/10.1111/1745-5871.12541>
- Strong, L. (2015, December 31). *Who has the right to call themselves a farmer?* Clover Hill Diaries.
<https://chdairiesdiary.wordpress.com/2015/12/31/who-has-the-right-to-call-themselves-a-farmer/>
- Suryanata, K., Mostafanezhad, M., & Milne, N. (2021). Becoming a new farmer: Agrarianism and the contradictions of diverse economies. *Rural Sociology*, 86(1), 139–164. <https://doi.org/10.1111/ruso.12355>
- Sutherland, L.-A., Barlagne, C., & Barnes, A. P. (2019). Beyond 'hobby farming': Towards a typology of non-commercial farming. *Agriculture and Human Values*, 36, 475–493. <https://doi.org/10.1007/s10460-019-09930-5>
- Thilmany, D., & Ahearn, M. (2013, March 2013). Beginning farmers and local food systems. *Communities and Banking*, 11–13. <https://www.bostonfed.org/publications/communities-and-banking/2013/spring/beginning-farmers-and-local-food-systems.aspx>
- Trauger, A., Sachs, C., Barbercheck, M., Brasier, K., & Kiernan, N. E. (2010). “Our market is our community”: Women farmers and civic agriculture in Pennsylvania, USA. *Agriculture and Human Values*, 27, 43–55.
<https://doi.org/10.1007/s10460-008-9190-5>
- U.S. Census Bureau. (2016). 2012–2016: *ACS 5-Year Estimates Data Profile – Selected Economic Characteristics*.
<https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2016/>
- U.S. Department of Agriculture Economic Research Service [USDA ERS]. (2022). *Farming and farm income*.
<https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/farming-and-farm-income/>
- USDA National Agricultural Statistical Service [USDA NASS]. (2016). *Indiana agricultural statistics 2015–2016*.
https://www.nass.usda.gov/Statistics_by_State/Indiana/Publications/Annual_Statistical_Bulletin/1516/IN1516Bulletin.pdf
- USDA NASS. (2019). *2017 census of agriculture*. <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

USDA NASS. (2020). *2017 Census – New and beginning producers*.

<https://www.nass.usda.gov/Publications/Highlights/index.php>

Van Der Ploeg, J. D., & Renting, H. (2000). Impact and potential: A comparative review of European rural development practices. *Sociologia Ruralis*, 40(4), 529–543. <https://doi.org/10.1111/1467-9523.00165>

Young Farmers Coalition (2017). *Building a future with farmers II: Results and recommendations from the National Young Farmer Survey*. <https://www.youngfarmers.org/resource/building-a-future-with-farmers-ii/>

Appendix A. Survey Instrument

(following pages)

Survey of Beginning Farmers in Indiana



Illustration: Dorling Kindersley, from <https://foodfreedom.wordpress.com/>

Background and instructions

This survey is part of a research and extension project conducted by Purdue University titled “Infrastructure, access, community: a plan to support beginning farmers in Indiana.” The objective of this survey is to learn about what motivates beginning farmers to start a farm, what challenges they face in starting, operating and sustaining their farm, and what information and resource needs they may have.

✓ For the purpose of this survey, please use the following definitions:

- Beginning farmers are considered as (1) anyone who has been farming 10 years or less, or (2) anyone who is interested in starting a farm.
- Small-scale farmers are considered as farmers who operate 250 acres of land or less.
- Veteran farmers are considered as farmers who served or are serving in the U.S. Military.

Your farm and/or interest in farming

1. Do you currently farm or operate a farm? *Check only one*

- ☐ Yes → If yes, please turn to the next page and start with Question 2. We would greatly appreciate if you could answer the remainder of the survey.
- ☐ No → If no, please answer the sub-questions below (1a-1f), and then turn to Page 4 and start with Questions 19. We would greatly appreciate if you could answer the remainder of the survey.

1a. Are you interested in starting a farm in Indiana in the future? *Check only one*

- ☐ Yes ☐ No → If no, please turn to Page 10 to only answer Questions 32-39.

1b. What makes you want to start a farm in Indiana? *Check all that apply*

- ☐ To pursue farming as a lifestyle
- ☐ To have a place where my family and I can enjoy each other's work and company
- ☐ To raise children to be close to the food they eat and the soil that supports us
- ☐ To raise my family to understand the importance of hard work
- ☐ To pass down the values, land, and way of farming to future generations
- ☐ To prevent farmland being converted to other uses
- ☐ To increase the presence of small farms
- ☐ To provide fresh food to our communities
- ☐ To contribute to the local food movement
- ☐ To have a place where our community members can see how food is grown/raised
- ☐ To promote environmentally friendly agricultural practices
- ☐ To support a sustainable food system
- ☐ To reduce the ecological impacts of food production, protect the environment, and conserve natural resources
- ☐ To get away from the political, economic, and social structures of our current food system
- ☐ To provide income for me and my family
- ☐ To promote local economies
- ☐ Other, please specify: _____
- ☐ Other, please specify: _____

1c. Which of the following best describes your current knowledge of starting a farm in Indiana?

Check only one

- ☐ No knowledge ☐ Limited knowledge ☐ Moderate knowledge ☐ Substantial knowledge

1d. What is your level of confidence in your ability to start a farm in Indiana? *Check only one*

- ☐ Not confident ☐ Minimally confident ☐ Moderately confident ☐ Very confident

1e. Which of the following would you like to grow or do on your future farm in Indiana? *Check all that apply*

- | | | | |
|---|---|--|-------------------------------------|
| ☐ Corn and soybean | ☐ Legumes other than soybean | | |
| ☐ Grains | ☐ Vegetables | ☐ Fruit | ☐ Flowers |
| ☐ Pastured poultry | ☐ Pastured pigs | ☐ Grass-fed beef | ☐ Goats |
| ☐ Bees | ☐ Dairy | ☐ Hydroponics | ☐ Aquaponics |
| ☐ Organic production | ☐ Permaculture | ☐ Value-added products (e.g., salsa, popcorn) | |
| ☐ Other, please specify: _____ | | | |

1f. Generally speaking, which of the following topics related to starting, operating and sustaining a farm would you like to learn about? *Check all that apply*

- | | |
|--|--|
| ☐ Land acquisition | ☐ Access to financial resources |
| ☐ Access to additional labor (e.g., hiring and working with interns) | ☐ Access to farm equipment |
| ☐ Business management practices | ☐ Marketing strategies |
| ☐ Environmentally sustainable farming practices | ☐ Farming with disability |
| ☐ Local and state regulations and rules about farming | ☐ Beginning farmer networks |
| ☐ Local, state, federal programs that assist beginning farmers to start, operate and sustain a farm | |
| ☐ Local, state, federal programs that assist military Veterans to start, operate and sustain a farm | |
| ☐ Other, please specify: _____ | |
| ☐ Other, please specify: _____ | |

2. Which of the following describes your background or experience related to farming prior to operating your current farm in Indiana? *Check all that apply*

- ☐ I grew up on a farm, which allowed me to experience the farm life.
☐ I had family members who owned a farm and I visited when I was growing up.
☐ I worked on a farm as a job or internship.
☐ I have been interested in farming and learned about farming and farm life on my own.
☐ I had no farming background or experience prior to operating my current farm.
☐ Other, please specify: _____

3. In which year did you, personally, first start operating your current farm in Indiana? _____

4. Which of the following have you grown or done on your farm in the past 12 months? *Check all that apply*

- | | | |
|---|--|---|
| ☐ Corn and soybean | ☐ Legumes other than soybean | ☐ Grains |
| ☐ Vegetables | ☐ Fruit | ☐ Flowers |
| ☐ Pastured poultry | ☐ Pastured pigs | ☐ Grass-fed beef |
| ☐ Goats | ☐ Bees | ☐ Dairy |
| ☐ Hydroponics | ☐ Aquaponics | ☐ Organic production |
| ☐ Permaculture | ☐ Value-added products (e.g., salsa, popcorn) | |
| ☐ Other, please specify: _____ | | |

5. How many acres of land do you farm? _____ acres

6. How did you acquire the land you farm? *Check all that apply*

- | | |
|---|--|
| ☐ I lease the land from others. | ☐ I received the land as a gift. |
| ☐ I inherited the land from a family member. | ☐ I bought the land from a family member. |
| ☐ I bought the land from someone outside of my family but I knew that person before. | |
| ☐ I bought the land from someone outside of my family who I didn't know before. | |
| ☐ Others, please specify: _____ | |

7. Is your home on or immediately next to the land where you farm in Indiana? *Check only one*

- ☐ Yes ☐ No → If no, how far is your home from your farm? _____ miles

8. How many people work on your farm in Indiana, either full-time or part-time, either from your household or outside of your household, including yourself?

No. of full-time from my household: _____ No. of full-time from outside of my household: _____
No. of part-time from my household: _____ No. of part-time from outside of my household: _____

9. Who made/makes decisions about farming practices and the operation of your farm in Indiana?

Check all that apply

- | | | | |
|---|--|--------------------------------------|-------------------------------------|
| ☐ Me | ☐ My spouse | ☐ My children | ☐ My parents |
| ☐ Another family member | ☐ My business partner | ☐ My landlord | |
| ☐ Other, please specify: _____ | | | |

10. How important are the following as reasons for why you started farming in Indiana?

Check only one for each row item

	Very important	Important	Moderately important	Of little importance	Not important
To pursue farming as a lifestyle	☐	☐	☐	☐	☐
To have a place where my family and I can enjoy each other's work and company	☐	☐	☐	☐	☐
To raise children to be close to the food they eat and the soil that supports us	☐	☐	☐	☐	☐

	Very important	Important	Moderately important	Of little importance	Not important
To raise my family to understand the importance of hard work	☐	☐	☐	☐	☐
To pass down the values, land, and way of farming to future generations	☐	☐	☐	☐	☐
To prevent farmland being converted to other uses	☐	☐	☐	☐	☐
To increase the presence of small farms	☐	☐	☐	☐	☐
To provide fresh food to our communities	☐	☐	☐	☐	☐
To contribute to the local food movement	☐	☐	☐	☐	☐
To have a place where our community members can see how food is grown/raised	☐	☐	☐	☐	☐
To promote environmentally friendly agricultural practices	☐	☐	☐	☐	☐
To support a sustainable food system	☐	☐	☐	☐	☐
To reduce the ecological impacts of food production, protect the environment, and conserve natural resources	☐	☐	☐	☐	☐
To get away from the political, economic, and social structures of our current food system	☐	☐	☐	☐	☐
To provide income for me and my family	☐	☐	☐	☐	☐
To promote local economies	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐

Current knowledge and farming practices

11. Generally speaking, what is your current level of knowledge regarding operating and sustaining a farm? Check only one

☐ No knowledge ☐ Limited knowledge ☐ Moderate knowledge ☐ Substantial knowledge

12. Which of the following describes your current familiarity with the following topics related to starting, operating, and sustaining a farm? Check only one for each row item

	Very familiar	Familiar	Moderately familiar	Of little familiarity	Not familiar
Land acquisition	☐	☐	☐	☐	☐
Access to financial resources	☐	☐	☐	☐	☐
Access to farm equipment	☐	☐	☐	☐	☐
Access to additional labor (e.g., hiring and working with interns)	☐	☐	☐	☐	☐
Business management practices	☐	☐	☐	☐	☐
Marketing strategies	☐	☐	☐	☐	☐
Local and state regulations and rules about farming	☐	☐	☐	☐	☐
Environmentally friendly agricultural practices	☐	☐	☐	☐	☐
Farming with disability	☐	☐	☐	☐	☐
Beginning farmer networks	☐	☐	☐	☐	☐
Local, state, federal programs that assist beginning farmers to start, operate and sustain a farm	☐	☐	☐	☐	☐
Local, state, federal programs that assist military Veterans to start, operate and sustain a farm	☐	☐	☐	☐	☐

13. Generally speaking, what is your level of confidence in your ability to operate and sustain your farm in Indiana? *Check only one*

☐ Not confident ☐ Minimally confident ☐ Moderately confident ☐ Very confident

14. Do you think you have the necessary information and knowledge needed to operate and sustain your farm? *Check only one*

☐ Yes ☐ No ☐ I don't know

15. Do you think you have the necessary resources (non-informational) needed to operate and sustain your farm? *Check only one*

☐ Yes ☐ No ☐ I don't know

16. Which of the following have occurred in the past 12 months? *Check all that apply*

- ☐ I sought financial assistance from a local, state or federal program to help me with my farm.
- ☐ I took a loan to help me with my farm.
- ☐ I sought technical assistance from an agricultural or natural resource professional to help me with farming decision and practices.
- ☐ I obtained information about sustainable farming practices.
- ☐ I participated in workshops, conferences, or information sessions about farming.
- ☐ I searched for information about farming on the Internet.
- ☐ I read about farming in magazines, books, and other publications.
- ☐ I talked to my family about farming and my farm.
- ☐ I talked to my neighboring farmers about farming and my farm.
- ☐ I talked to other farmers who is not my neighbor about farming and my farm.
- ☐ Other, please specify: _____
- ☐ None of the above

17. Do you have a business management plan for your farm in Indiana?

☐ Yes → **If yes, do you find your business management plan useful?**

☐ Yes ☐ No ☐ I don't know

☐ No → **If no, do you plan to develop a business management plan?**

☐ Yes ☐ No ☐ I don't know

18. How do you market and sell your products? *Check all that apply*

- ☐ Sell on farm
- ☐ Sell on the side of the road
- ☐ Sell to restaurants
- ☐ Sell in a farmers' market
- ☐ Other, please specify: _____
- ☐ Have a website to sell via the Internet
- ☐ Send flyers and mailers to potential customers
- ☐ Establish personal contact with potential customers directly
- ☐ Sell through a CSA (community-supported agriculture) program

Challenges and needs

19. In terms of starting, operating and sustaining a farm in Indiana, how challenging has the following been for you personally? *Check only one for each row item*

	Great challenge	Moderate challenge	Little challenge	Not a challenge
Secure the land needed to farm	☐	☐	☐	☐
Secure the equipment needed to farm	☐	☐	☐	☐
Decide what to grow/raise on my farm	☐	☐	☐	☐
Decide what farming techniques and practices to use	☐	☐	☐	☐
Obtain information to answer questions about my farm	☐	☐	☐	☐

	Great challenge	Challenge	Moderate challenge	Little challenge	Not a challenge
Sift through different sources of information to find what I need to know	☐	☐	☐	☐	☐
Understand and deal with zoning regulations and other local and state policies	☐	☐	☐	☐	☐
Deal with local and state politics related to operating a farm	☐	☐	☐	☐	☐
Know who to contact when I have a question about my farm	☐	☐	☐	☐	☐
Obtain financial resources needed to farm	☐	☐	☐	☐	☐
Have enough time/labor to do what is needed for the farm	☐	☐	☐	☐	☐
Understand the environmental impacts of my farming practices	☐	☐	☐	☐	☐
Get along with other farmers in my area (town/county)	☐	☐	☐	☐	☐
Find emotional and other support from peer farmers or people who are interested in farming	☐	☐	☐	☐	☐
Understand the business side of operating a farm	☐	☐	☐	☐	☐
Identify effective marketing strategies	☐	☐	☐	☐	☐
Have to balance farming and other jobs I do for income	☐	☐	☐	☐	☐
Deal with family issues (e.g., stress from farming, lack of time spent with family, lack of understanding from family)	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐

20. In terms of helping you start, operate and sustain a farm, how important would you rate the following items? *Check only one for each row item*

	Very important	Important	Moderately important	Of little importance	Not important
Being able to visit other similar farms	☐	☐	☐	☐	☐
Being able to talk to and learn from other farmers	☐	☐	☐	☐	☐
Being able to talk to an Extension educator or other agricultural professionals	☐	☐	☐	☐	☐
Being part of a formal farmer group, association or organization	☐	☐	☐	☐	☐
Being part of an informal farmer group	☐	☐	☐	☐	☐
Feeling supported by other small-scale farmers	☐	☐	☐	☐	☐
Feeling supported by larger-scale farms around me	☐	☐	☐	☐	☐
Feeling supported by my (potential) customers	☐	☐	☐	☐	☐
Feeling supported within my own community	☐	☐	☐	☐	☐
Having a way to discuss and communicate with other farmers	☐	☐	☐	☐	☐
Being able to receive more training and information about different aspects of managing a farm business	☐	☐	☐	☐	☐
Being able to access pertinent technical and informational resources for beginning farmers	☐	☐	☐	☐	☐
Being able to access pertinent financial resources for beginning farmers	☐	☐	☐	☐	☐

Communication and information sources

21. If you are searching for information about starting, operating, or sustaining a small-scale farm, where would you go or who would you ask? *Check all that apply*

- ☐ Purdue Extension educators in my county or nearby counties
- ☐ Purdue Extension website
- ☐ Sustainable Agriculture Research and Education Program (SARE)
- ☐ Natural Resources Conservation Service (NRCS)
- ☐ Soil and Water Conservation Districts (SWCD)
- ☐ Farm Service Agency
- ☐ Indiana State Department of Agriculture
- ☐ Indiana Small Farm Conferences or other conferences
- ☐ Farmer associations and groups (e.g., Local Growers' Guild)
- ☐ Farmer Veteran Coalition
- ☐ AgrAbility
- ☐ Industry groups or organizations, such as the Indiana Farm Bureau
- ☐ Farm Credit Services
- ☐ Academic research papers
- ☐ My own research on the Internet
- ☐ Farmers I know who started and are operating a small-scale farm
- ☐ Farmers who started and/or operating big farms
- ☐ Private crop advisors or other types of agricultural consultants
- ☐ Other, please specify: _____

22. What do you prefer in terms of searching for or receiving information about farming?

Check all that apply

- ☐ Mobile texting
- ☐ Facebook
- ☐ Twitter
- ☐ Blogs
- ☐ Websites
- ☐ Local newspapers
- ☐ Radio programs
- ☐ TV programs
- ☐ Phone calls
- ☐ Emails
- ☐ Agricultural professionals pay a personal visit to my farm
- ☐ Word of mouth
- ☐ Direct mailing of hard-copy flyers, brochures, newsletters and other publications
- ☐ Face-to-face workshops, training, and other informational events
- ☐ Online workshops, webinars, training, and other informational events
- ☐ Other, please specify: _____

23. On average, how often have you interacted with and/or received information from the following individuals and entities since you became a farmer or interested in farming?

Check only one for each row item

	Once a week	Several times a month	Once a month	Several times a year	Twice a year	Once a year	Once every few years	Never
Purdue Extension educators	☐	☐	☐	☐	☐	☐	☐	☐
Natural Resources Conservation Service professionals	☐	☐	☐	☐	☐	☐	☐	☐
Soil and Water Conservation Districts professionals	☐	☐	☐	☐	☐	☐	☐	☐
Indiana State Department of Agriculture professionals	☐	☐	☐	☐	☐	☐	☐	☐
Other government agencies, such as: _____	☐	☐	☐	☐	☐	☐	☐	☐
Local, state or national non-profit organizations or farmer associations and groups (e.g., Local Growers' Guild, Farmer Veteran Coalition, Indiana Young Farmers' Association, etc.)	☐	☐	☐	☐	☐	☐	☐	☐
Industry groups or organizations (e.g., Indiana Farm Bureau, Indiana Beef Cattlemen's Association, etc.)	☐	☐	☐	☐	☐	☐	☐	☐
Private crop advisors or other agricultural consultants	☐	☐	☐	☐	☐	☐	☐	☐

24. What was your aforementioned interaction with agricultural or natural resource professionals about? Check all that apply

I had questions, received information, or obtained assistance about:

- | | |
|--|--|
| ☐ Land acquisition | ☐ Access to financial resources |
| ☐ Access to additional labor (e.g., hiring and working with interns) | ☐ Access to farm equipment |
| ☐ Business management practices | ☐ Marketing strategies |
| ☐ Environmentally sustainable farming practices | ☐ Farming with disability |
| ☐ Local and state regulations and rules about farming | ☐ Beginning farmer networks |
| ☐ Local, state, federal programs that assist beginning farmers to start, operate and sustain a farm | |
| ☐ Local, state, federal programs that assist military Veterans to start, operate and sustain a farm | |
| ☐ Having an Extension educator visit their farm | |
| ☐ Attending an Extension workshop or event | |
| ☐ Visiting a demonstration site or other small-scale farms | |
| ☐ Other, please specify: _____ | |
| ☐ Not applicable, because I have not interacted with any agricultural and natural resource professionals about my farm. | |

Your farming community and support

25. Do you know any of the following types of individuals in Indiana personally?

Check only one for each row item

	Yes	No	Don't know
Individuals who are interested in starting a farm but have not yet	☐	☐	☐
Beginner farmers (less than 10 years of experience)	☐	☐	☐
Experienced farmers (10 years or more experience)	☐	☐	☐
Small-scale farmers (those who tend to grow or produce a variety of crops or livestock products on smaller tracts of land)	☐	☐	☐
Larger-scale farmers (those who tend to grow mostly corn and soybean on larger tracts of land)	☐	☐	☐

26. On average, how often have you interacted with any of the following types of individuals in Indiana since you became a farmer or interested in farming? Check only one for each row item

	Once a week	Several times a month	Once a month	Several times a year	Twice a year	Once a year	Once every few years	Never
Individuals who are interested in starting a farm but have not yet	☐	☐	☐	☐	☐	☐	☐	☐
Other small-scale farmers in my town	☐	☐	☐	☐	☐	☐	☐	☐
Larger-scale farmers in my town	☐	☐	☐	☐	☐	☐	☐	☐
Other small-scale farmers in my county	☐	☐	☐	☐	☐	☐	☐	☐
Larger-scale farmers in my county	☐	☐	☐	☐	☐	☐	☐	☐
Other small-scale farmers in the state of Indiana	☐	☐	☐	☐	☐	☐	☐	☐
Larger-scale farmers in the state of Indiana	☐	☐	☐	☐	☐	☐	☐	☐
Other small-scale farmers outside of Indiana	☐	☐	☐	☐	☐	☐	☐	☐
Larger-scale farmers outside of Indiana	☐	☐	☐	☐	☐	☐	☐	☐

27. Since you became a farmer or interested in farming, have you worked with, helped, or been helped by any of the following types of individuals in Indiana for farming-related reasons?

Check only one for each row item

	Yes	No	Don't know
Individuals who are interested in starting a farm but have not yet	☐	☐	☐
Other small-scale farmers in my town	☐	☐	☐
Larger-scale farmers in my town	☐	☐	☐
Other small-scale farmers in my county	☐	☐	☐
Larger-scale farmers in my county	☐	☐	☐
Other small-scale farmers in the state of Indiana	☐	☐	☐
Larger-scale farmers in the state of Indiana	☐	☐	☐
Other small-scale farmers outside of Indiana	☐	☐	☐
Larger-scale farmers outside of Indiana	☐	☐	☐

28. Where do your interactions with other farmers or individuals who are interested in starting a farm occur? Check all that apply

- ☐ At the farmers' markets
- ☐ On my or other people's farms when we visit each other
- ☐ In my town community center
- ☐ In my local stores
- ☐ Via workshops, conferences, or information sessions organized by Purdue Extension
- ☐ Via workshops, conferences, or information sessions organized by a government agency, such as NRCS, SWCD, ISDA
- ☐ Via workshops, conferences, or information sessions organized by an industry group or organization, such as Indiana Farm Bureau and Indiana Beef Cattlemen's Association
- ☐ Via a non-profit organization or farmer association, such as Local Growers' Guild, Farmer Veteran Coalition, and Indiana Young Farmers' Association
- ☐ Through an internet-based tool, such as Facebook, blog, or a farmer organization chatroom
- ☐ Other, please specify: _____
- ☐ Other, please specify: _____

29. Generally speaking, where do you feel support for you and your farm come from?

Check only one for each row item

	Strong support	Support	Moderate support	Of little support	No support
Other individuals who are interested in starting a farm but have not yet	☐	☐	☐	☐	☐
Other small-scale farmers in my town	☐	☐	☐	☐	☐
Larger-scale farmers in my town	☐	☐	☐	☐	☐
Other small-scale farmers in my county	☐	☐	☐	☐	☐
Larger-scale farmers in my county	☐	☐	☐	☐	☐
Other small-scale farmers in the state of Indiana	☐	☐	☐	☐	☐
Larger-scale farmers in the state of Indiana	☐	☐	☐	☐	☐
Other small-scale farmers outside of Indiana	☐	☐	☐	☐	☐
Larger-scale farmers outside of Indiana	☐	☐	☐	☐	☐
Various farmers' markets I go to	☐	☐	☐	☐	☐
Various CSAs that I am connected to	☐	☐	☐	☐	☐
My spouse/partner	☐	☐	☐	☐	☐
My family beyond my spouse/partner	☐	☐	☐	☐	☐

	Strong support	Support	Moderate support	Of little support	No support
Other individuals who are interested in starting a farm but have not yet	☐	☐	☐	☐	☐
Other small-scale farmers in my town	☐	☐	☐	☐	☐
Larger-scale farmers in my town	☐	☐	☐	☐	☐
Other small-scale farmers in my county	☐	☐	☐	☐	☐
My non-farming friends	☐	☐	☐	☐	☐
My farming friends	☐	☐	☐	☐	☐
Extension educators or other agricultural professionals	☐	☐	☐	☐	☐
The farmer group, association or organization I am part of	☐	☐	☐	☐	☐
The social media that I am connected to (e.g., Facebook friends, twitter followers, blogs, chatrooms, etc.)	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐
Other, please specify: _____	☐	☐	☐	☐	☐

30. Are you a member of a formal or informal farmer group, association or organization?

☐ No

☐ Yes → **If yes, what is the name of your group, association or organization?** _____

If yes, how is your farmer/producer/grower group, association or organization beneficial to you? Check all that apply

- ☐ My group, association or organization operates a website that I can use to market my farm products.
- ☐ My group, association or organization sends out event notifications.
- ☐ My group, association or organization keeps me informed about state and federal regulations.
- ☐ I see my group, association or organization as a source of support, advice, or help.
- ☐ I meet and network with other farmers/producers/growers through my group, association or organization.
- ☐ Other, please specify: _____

31. How much do you agree with the following statements describing what you consider as your community regarding farming? Check only one for each row item

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
How I think about my community is tied to where I live and farm (e.g., my town, my county, etc.)	☐	☐	☐	☐	☐
I consider the customers of my farm products part of my community.	☐	☐	☐	☐	☐
I consider other small-scale farmers in my town or county part of my community.	☐	☐	☐	☐	☐
I consider other larger-scale farmers in my town or county part of my community.	☐	☐	☐	☐	☐
Farmers are farmers, and there is no big difference between small-scale and larger-scale farming.	☐	☐	☐	☐	☐
I have an "inner circle" of people who do not farm that I rely on for support, advice, or help regarding my farm.	☐	☐	☐	☐	☐
I have an "inner circle" of people who farm that I rely on for support, advice, or help regarding my farm.	☐	☐	☐	☐	☐
There is an overlap between my circle of peer farmers and my social circle.	☐	☐	☐	☐	☐

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
Small-scale farming is a hard job that can only be understood by other small-scale farmers.	☐	☐	☐	☐	☐
Small-scale farming can be an isolating endeavor.	☐	☐	☐	☐	☐
Small-scale farming is not easy work, but I find its benefits to me, my family, and my community outweigh the difficulties.	☐	☐	☐	☐	☐
I sometimes just want to talk to someone about what I am going through as a small-scale farmer.	☐	☐	☐	☐	☐
The idea of small-scale farmers supporting and helping each other is great but hard to make it reality.	☐	☐	☐	☐	☐
I don't care what others are saying about my farming practices as long as I can make a good living.	☐	☐	☐	☐	☐
As part of a small-scale farming community, I care about what others think about my farming practices.	☐	☐	☐	☐	☐
Being part of a small-scale farmer community is important to me.	☐	☐	☐	☐	☐
It is important to me that I have the ability to provide support, advice, or help to other small-scale farmers.	☐	☐	☐	☐	☐
It is important to me that other small-scale farmers would provide support, advice, or help to me when needed.	☐	☐	☐	☐	☐

Demographics

32. Are you a military veteran or active duty member? *Check only one*

☐ No ☐ Yes

33. What is your ethnicity? *Check only one*

☐ Hispanic ☐ Non-Hispanic

34. What is your age? I am _____ years old.

35. What is your gender? *Check only one*

☐ Male ☐ Female ☐ Other ☐ Prefer not to answer

36. What is the highest degree or level of school you have completed? *Check only one*

☐ Less than high school/GED ☐ High school/GED ☐ Some college
☐ Associate's degree ☐ Bachelor's degree ☐ Graduate degree

37. What is your household's annual income? *Check only one*

☐ Less than \$25,000 ☐ \$25,000 to \$49,999 ☐ \$50,000 to \$99,999
☐ \$100,000 to \$149,999 ☐ \$150,000 to \$199,999 ☐ \$200,000 or more

38. On average, what percentage of your household's annual income is derived from your farm?

_____ percent

39. On average, what percentage of your household's annual income is derived from off-farm sources?

_____ percent

If there are any additional comments about information and/or resources you may need to help you start, operate and sustain your farm or concerns that you would like to share, please write them below.

Thank you for participating in this survey!
Please return your completed questionnaire in the self-addressed, postage-paid envelope provided.

If you would like a copy of the summary results of this survey, please print your name and address on the back of the return envelope.

“The farm has an insatiable appetite”: A food justice approach to understanding beginning farmer stress

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Abstract

Beginning farmers are critical in shaping resilient food systems amid a worsening climate crisis.

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Reports indicate a prevalence of stress and adverse mental health outcomes among U.S. farmers, yet there are gaps in the literature concerning the well-being of beginning farmers, a heterogeneous group with a growing number of women and BIPOC (Black, Indigenous, or People of Color) producers. The agricultural industry has a legacy of systemic

Disclosures

From September 2020 to May 2021, Fiona Doherty did her master of social work field placement with the Ohio Ecological Food and Farm Association (OEFFA), and she received compensation through the SARE research grant funds. She did not stand to gain financially from the results of the project or benefit in any specific way from the results.

From September 2020 to May 2021, Rachel Tayse was a paid staff member and community partner at OEFFA. In May 2021, she left her position at OEFFA. From May 2021 to August 2022, she received compensation from the SARE research grant funds for her continued involvement as a key informant in the research project. She did not stand to gain financially from the results of the project or benefit in any specific way from the results.

oppression and exploitation of marginal communities. Thus, it is important to understand the unique needs of an emerging, more diverse generation of farmers, especially as discrimination is associated with stress and poor mental health outcomes. In this community-engaged, mixed methods research project, we utilize a food justice framework to understand systemic stressors and coping strategies among Midwestern beginning farmers. Beginning farmers in the Midwest were recruited using purposive sampling to participate in quantitative surveys and in-depth interviews. The survey ($n=62$) included measures of farm stress, mental health supports, and farm characteristics; the Patient Health Questionnaire-4; and sociodemographic information. Interviews ($n=20$) were conducted to establish a deeper understanding of stress and mental health experiences. Survey data were analyzed using descriptive statistics. Interviews were analyzed using thematic analysis. Top stressors included having too much to do and too little time, COVID-19, not enough person-power on the farm, climate change, and social justice. Of survey respondents, 58% reported mild to severe symptom burden of anxiety or depression. Five qualitative themes emerged, including the stress of capitalism, discrimination and inequitable access to resources, aids and gaps in social support, rugged individualism, and heterogeneous perspectives on social justice and climate change. Four transformative food justice practices aimed at rectifying structural inequalities inform our implications. Our results emphasize the urgency of systemic change and structural support for beginning farmers.

Keywords

Beginning Farmers, Stress, Mental Health, Food Justice, Midwest, Mixed Methods, Community-Engaged Research

Introduction

Beginning farmers hold many promises for the future. They are critical for shaping resilient food systems (Shute et al., 2011) and important constituents in mitigating climate change through sustainable practices (National Young Farmers Coalition, 2021). Beginning farmers (i.e., those farming for 10

years or less; U.S. Department of Agriculture [USDA] Economic Research Service [ERS], 2022) face unique start-up challenges, including reliance on off-farm income, high debt-to-asset ratios (Key & Lyons, 2019), and difficulties in accessing land (Ahearn, 2011). Reports suggest a prevalence of depression, anxiety, and suicide among U.S. farmers (Arif et al., 2021; Wedell et al., 2020; Weingarten, 2018); minimal literature exists concerning beginner farmers' well-being.

Compared to experienced farmers, beginning farmers are a more heterogeneous group, with increasing numbers of Asian (USDA National Agricultural Statistics Service [NASS], 2019a), Black (USDA NASS, 2019b), female (USDA NASS, 2019c), Hispanic (USDA NASS, 2019d), and multiracial producers (USDA NASS, 2020). This diversity is important to acknowledge, as U.S. farm stress scholarship focuses on white, cisgender male experiences, neglecting factors of race (Charles, 2022) and identity beyond the gender binary. U.S. agriculture is built on generations of systemic oppression and the exploitation of marginalized communities. Examples of systemic oppression include enslavement of Africans as part of the transatlantic slave trade (Hinson & Robinson, 2008), land theft from Indigenous peoples (Horst & Marion, 2019; Lee et al., 2020), and institutional racism against Black, Latine, and women farmers (Carpenter, 2012). It is critical to understand the needs of an emerging, diverse generation of U.S. farmers, especially when research suggests discrimination (e.g., racism, sexism, and homophobia) is associated with stress and poor mental health outcomes (Berg, 2006; Kirkinis et al., 2021; Meyer, 2003).

Farmer stress, equity issues, and start-up barriers are common in the U.S. Midwest, a highly productive agricultural region significant for local and global economies (USDA Climate Hubs, n.d.). Farmland consolidation is more prevalent in the Midwest than other U.S. regions, and along with structural discrimination, consolidation has contributed to the decline of beginning and Black farmers since 1978 (Union of Concerned Scientists, 2021). Midwestern farmers face an array of stressors (Arora et al., 2020; Chengane et al., 2021; Henning-Smith et al., 2022). Between 2014 and

2018, 450 Midwestern farmers died by suicide (Wedell et al., 2020).

We conducted community-engaged, mixed methods research with the Ohio Ecological Food and Farm Association (OEFFA) to understand concerns about beginning farmers' stress. OEFFA provides education and technical assistance to farmers throughout the Midwest. We employed a food justice framework to (a) understand systemic factors contributing to stress for Midwestern beginning farmers, and (b) examine how Midwestern beginning farmers cope with systemic stressors. We integrated participants' mental health experiences because chronic stress can lead to adverse mental health outcomes (e.g., anxiety and depression; American Psychological Association, 2023; Marin et al., 2011). We conclude with implications for policy, practice, and research, emphasizing urgency for systemic change and structural support.

Farmer Stress and Mental Health

Farmer stress and mental health have gained recognition globally, with increasing attention to occupational stress and farmer suicides. Stress is defined as a physiological response to external stimuli (National Institute of Mental Health, n.d.); too much stress can compromise physical and mental well-being (World Health Organization, 2023). Mental health describes a state of well-being in which people can cope with stress effectively and achieve their potential to live, learn, and contribute to communities (World Health Organization, 2022). In their globally focused systematic review, Daghigh Yazd et al. (2019) listed the most-cited farmer psychological stressors as pesticide exposure, financial hardship (i.e., income and market conditions), weather unpredictability, and poor physical health. Finances, workload, and weather are top stressors for U.S. Midwest farmers (Arora et al., 2020; Rudolphi et al., 2020). Farmer stress is linked to suicidal behavior (Santos et al., 2021), farm exit (Waldman et al., 2021), farm family distress (Sprung, 2022), poor animal welfare (Hansen & Østerås, 2019), and decreased motivation to adopt sustainable agriculture practices (Karami & Keshavarz, 2010).

A scoping review about farmer mental health

trends identified a need to examine mental health experiences among subpopulations of farmers (Hagen et al., 2019). Studies have explored stress and mental health factors among subgroups of organic farmers (Brigance et al., 2018; David et al., 2021), younger farmers (Rudolphi et al., 2020), and women farmers (Carruth & Logan, 2002). Other studies have explored subgroups within their sample, such as the unique stressors of women farmers (Daghigh Yazd et al., 2019; Hagen et al., 2021; Henning-Smith et al., 2022). However, there is a dearth of studies considering gender beyond the binary of male and female; only one farm stress study recognized gender-nonbinary individuals in their sample (Hagen et al., 2021). Furthermore, there is scarce published quantitative research on queer farmers (Dentzman et al., 2021), let alone research focused on their unique stressors. Race and ethnicity are also often neglected in studies of farmer stress or mental health in the U.S. (Charles, 2022). Despite their critical role as future stewards of the food supply, we found no studies on the stress or mental health of beginning farmers.

Discrimination in the U.S. Agriculture Industry

Structural discrimination against women; lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQ+) people; and BIPOC farmers has led to unequal land ownership and disparate access to farm resources and capital. Notable examples include civil rights lawsuits against the USDA for racial or gender-based discrimination, including *Pigford v. Glickman*, *Love v. Vilsack*, *Garcia v. Vilsack*, *Keepseagle v. Vilsack* (Carpenter, 2012), and the Hispanic and women farmers and ranchers claims resolution process (U.S. Department of Justice, 2011). As a result of structural oppression, the number of U.S. Black farmers decreased by 93% between 1940 and 1974 (Gilbert et al., 2002; Minkoff-Zern & Sloat, 2017). Specific examples of oppression include poor access to credit (Hinson & Robinson, 2008), lack of legal representation or wills (Hinson & Robinson, 2008), land lost through partition of heirs property sales (Dyer & Bailey, 2008), discriminatory lending practices (Touzeau, 2019; Tyler et al., 2014), and inadequate government outreach to Black farmers (Tyler et al., 2014). From 2012 to 2014, 98% of U.S. farmland was

owned by white individuals, 86% of farm operators were male, and women and farmers of color generated less farm income per person than did white men (Horst & Marion, 2019). Though U.S. Secretary of Agriculture Tom Vilsack declared “a new era of civil rights” for the USDA in 2009 (Vilsack, 2009), many discrimination claims remain unapproved and unpaid (Leslie et al., 2019; Minkoff-Zern & Sloat, 2017), leading to unresolved redress, mistrust of the USDA, and continued collective hardship for farmers from marginalized identities.

Pernicious cultural norms within the U.S. agricultural community also contribute to racial and gender-based oppression. Martin and Hartmann (2022) unearthed themes of toxic masculinity, heteronormative values, and “strong bigoted views against members of the LGBTQ community” (p. 1) among agriculture students at a land-grant university. The commonly utilized family farm model exudes heteronormativity and acts as a barrier to accessing “land, labor, credit, and knowledge” for women and LGBTQ+ farmers (Leslie et al., 2019, p. 929). For example, gender disparities persist in farm inheritance, as daughters are less likely than sons to inherit farmland (Alsgaard, 2012). Notions of heterosexism and heteronormativity can make LGBTQ+ farmers feel invisible to farm-related organizations and their communities (Hoffelmeyer, 2019). Experiences of racism are associated with distrust of agriculture-related government agencies (Balvanz et al., 2011) and avoidance of community participation (Medel-Herrero et al., 2021) among BIPOC farmers and farm workers. The appropriation of traditional BIPOC agricultural knowledge is another insidious form of racism (Layman & Civita, 2022).

Discrimination and Stress

Experiences of discrimination are associated with poor health outcomes. Kirkinis et al.’s (2021) systematic review found positive associations between racial discrimination and trauma, an acute form of stress. Berg (2006) found a positive relationship between women’s experiences of everyday sexism and post-traumatic stress disorder, especially among those who have experienced recent sexist degradation (Berg, 2006). Additional studies have found similar results among the LGBTQ+ popula-

tion (Herek et al., 1999; Meyer, 2003). The historical and present-day discrimination against farmers from marginalized identities and the lack of research focused on their unique stress informed our decision to utilize a food justice lens for this study.

Theoretical Framework: Food Justice

Food justice is a food system objective and a collection of transformative practices aimed at rectifying structural inequalities. Food justice occurs when the benefits and hazards of food production, distribution, and access are experienced equally (Gottlieb & Joshi, 2010). We embrace four transformative practices of food justice based on Gottlieb and Joshi (2010), Cadieux and Slocum (2015), Glennie and Alkon (2018), Leslie and White (2018), and Leslie (2019). First, we acknowledge that oppression occurs in each food system sector, “from farm to plate” (Leslie, 2019, p. 931). Food justice scholarship about agricultural labor has been decreasing (Glennie & Alkon, 2018), necessitating a renewed focus on the well-being of those who produce food.

Second, with a food justice lens, we can understand and heal collective trauma enacted by the mechanisms of structural power that harm socially vulnerable groups (Cadieux & Slocum, 2015), such as systemic discrimination within the U.S. agriculture industry. We embrace a temporal scale that recognizes the effects of historical trauma and looks toward a more equitable future.

Third, we incorporate an intersectional approach, considering overlapping factors of race, class, and gender identities (Leslie, 2019). Dentzman et al. (2021) demonstrated that queer farmers in U.S. agriculture are more likely to be racial and ethnic minorities, emphasizing the importance of intersectional perspectives. Social identities of gender and sexuality have been largely absent as core components of agricultural research, resulting in increased calls for more inclusive and intersectional approaches (Leslie et al., 2019).

Fourth, we recognize that oppression and resistance coincide (Leslie, 2019; Leslie & White, 2018). With a food justice lens, we can map food system inequalities while amplifying strategies of resistance and agency. Therefore, our research focuses on systemic stressors and coping strategies.

Methods

Community-Engaged Research

This study was guided by community-engaged research principles in collaboration with OEFFA. Honoring the concept of “nothing about us, without us” (Nelson et al., 1998; Padgett, 2016), we invited and compensated three beginning farmer key informants. We embraced the “three Ps” of community engagement: perspective, partnership, and participation (Padgett, 2016, p. 43). A food justice perspective informed our co-creation of research questions, methods, and results dissemination. Partnership occurred through research meetings, shared measurement selection, data collection support, and collaborative data analysis and writing. OEFFA and the key informants were critical gatekeepers (McKenna & Main, 2013), providing university researchers with access to beginning farmers, particularly marginalized participants.

Design and Procedure

Our community-university research team designed an explanatory sequential mixed methods study (see Figure 1), including a quantitative survey followed by qualitative in-depth interviews. While quantitative data provided a rudimentary understanding of farmer stress, qualitative data brought a richer understanding of stress and mental health experiences (Creswell & Clark, 2017). Mixed methods data integration occurred through a building technique, where survey results informed the interview phase, and a narrative weaving approach for the results (Fetters et al., 2013).

Data and Sample

Using purposive sampling, we recruited beginning

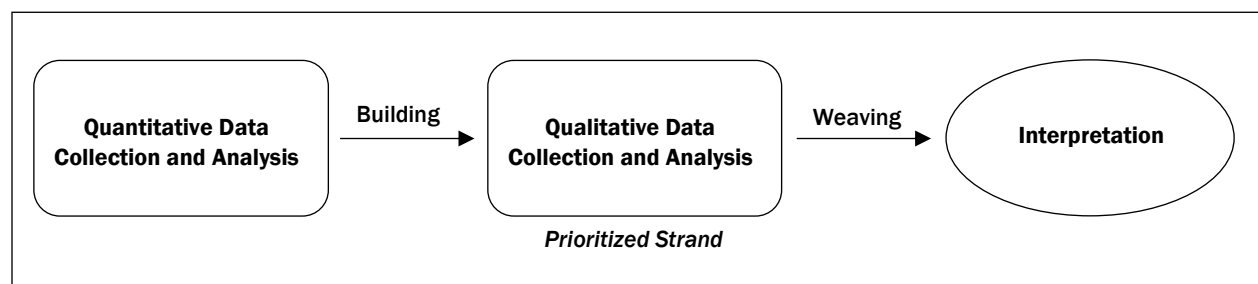
farmers through OEFFA’s email distribution list of 632 contacts in the U.S. Midwest. Participating respondents were 18 years of age or older, able to read and understand basic English, and were farmers with 10 years or less of experience. We defined farming as regularly growing farm products for people outside of one’s household, rather than binding the definition to capital ownership or economic production, which ignores marginalized groups who experience barriers to land ownership and mainstream market avenues (Leslie et al., 2019; White, 2018). Most participants lived in Ohio or Michigan. In October 2020, 64 participants completed a 15-minute survey administered using Qualtrics software. In March 2021, we recruited 20 interviewees from the same population to establish a more in-depth understanding of systemic stressors and coping mechanisms. The first author, a white, cisgender woman, conducted and recorded each interview using Zoom and transcribed them verbatim. The interviews ranged from 45 to 90 minutes, averaging 71 minutes. Participants received a mental health resource guide due to the sensitive topics covered and a VISA gift card (\$20 for the survey and \$50 for the interview).

Survey Measures

Farm stress survey

We used a modified farm stress survey informed by Eberhardt and Pooyan’s (1990) and Rudolphi et al.’s (2020) measurements (Appendix A). With input from OEFFA and key informants, biased language was revised to be inclusive of farmer diversity (gender identity and race) and types of farm operations (small farms or ecologically oriented farms). We modified the survey to reflect

Figure 1. Community-Engaged Explanatory Sequential Mixed Methods Research Design



food justice and included questions on discrimination and social justice. Our farm stress survey contained 52 items in seven subcategories (working conditions, social and geographic factors, personal finances, time pressure, environmental conditions, current events and policy, and employee relations), with Likert scale responses (0=*None*, 1=*Very little*, 2=*Some*, 3=*Quite a bit*, 4=*A great deal*, or *Not applicable*). Respondents reported how much worry or concern each item had caused them in the past year. A higher score indicated greater stress. Means were calculated for each item to establish which items contributed the most stress. Internal reliability (Cronbach's α) for the farm stress scale and subscales ranged from 0.74 to 0.98.

Patient health questionnaire

We used the Patient Health Questionnaire (PHQ-4) four-item screening tool to identify potential anxiety and depression symptoms (Kroenke et al., 2009). Anxiety and depression are the most common mental health conditions in the U.S. (Anxiety and Depression Association of America, 2022a). The PHQ-4 is a measurement of symptom burden. Respondents were asked whether, in the previous 2 weeks, they had experienced (a) feeling nervous, anxious, or on edge; (b) not being able to stop or control worrying; (c) feeling down, depressed, or hopeless; or (d) having little interest or pleasure in doing things. Question responses were 4-point Likert scales (0=*Not at all*, 1=*Several days*, 2=*More than half the days*, and 3=*Nearly every day*). The four items were summed for a total PHQ-4 score, ranging from 0 to 12, resulting in four categories of anxiety and depression: minimal (0–2), mild (3–5), moderate (6–8), or severe (9–12; Kroenke et al., 2009). The first two question responses were summed to determine whether anxiety was suggested; the final two question responses were summed to determine whether depression was suggested. Internal reliability (Cronbach's α) for the scale and subscales ranged from 0.88 to 0.91.

Mental health support

We examined dichotomous measures (1=*Yes*, 0=*No*) of eight mental health supports respondents had accessed in the previous 12 months: in-person counseling or therapy, telecounseling, crisis hotline,

inpatient psychiatric services, Web-based resources, faith-based services, alternative or body-based therapy, or other. We established this list of mental health support measures with the localized knowledge of our community partner and key informants.

Sociodemographic and farm measures

Sociodemographic characteristics included gender identity (male, female, nonbinary, or prefer to self-describe), age, and race/ethnicity (white, Hispanic/Latine/Spanish origin, Black/African American, Asian, American Indian/Alaska Native, Middle Eastern/North African, Native Hawaiian/Pacific Islander, or other). Farm measures included location (rural, suburban, urban, rural-urban fringe), production practices, type of agricultural products, and whether the respondent was a first-generation farmer or had an off-farm job.

Interview Measures

The semistructured interview guide (Appendix B) included questions related to stress and mental health experiences as beginning farmers. To minimize bias, we used plain language (Plain Language Action and Information Network, 2011), avoided leading questions, and did not use coercive, academic, classist, and/or racist language (MGH Institute of Health Professions, 2022). We also gathered age, race/ethnicity, and gender identity demographic information.

Analytic Strategy

We analyzed quantitative survey and qualitative interview data separately and through integrative analysis. With SPSS, we examined means, frequencies, and percentages of quantitative variables. Two respondents completed less than half of the survey and were excluded from analysis. We used an iterative thematic qualitative analysis for its flexibility and functionality in understanding participants' lived experiences and finding patterns across data (Clarke & Braun, 2017). After transcription, we read and reread interviews to become familiar with the data (Kiger & Varpio, 2020), performed initial inductive coding (Chandra & Shang, 2019), and used second-cycle "pattern coding" to condense and organize codes into categories (Saldaña, 2016,

p. 236). After an iterative process of reviewing, comparing, and grouping, we synthesized categories into themes and subthemes (Kiger & Varpio, 2020) which, along with associated codes and categories, were reviewed for consistency and meaningfulness with OEFFA and key informants (Kiger & Varpio, 2020). One team member led the coding process while other team members and key informants audited their efforts (Saldaña, 2016). For integrative data analysis, we compared quantitative and qualitative results and searched for data convergence and divergence (Creswell & Clark, 2017).

Results

Survey respondents ($n=62$) farmed annual produce (68%), perennial produce (45%), livestock (44%), flowers (26%), grain (19%), and dairy (3%). Most respondents were certified organic (16%) or were using organic practices but not certified (65%). Only 7% of the survey sample reported using chemical fertilizers and pesticides; this was consistent with the interview sample. Sixty-eight percent of survey participants worked an off-farm job. Sixty percent farmed in rural areas, 22% in a rural-urban fringe, 10% in urban areas, and 8% in suburban areas. Survey respondents ranged from 25 to 74 years old with 57% reporting their age as 25 to 44 years old. The mean age of interviewees was 38.3, ranging from 27 to 60 years old. Sixty percent of interviewees farmed diversified vegetable opera-

tions, 25% raised livestock, 10% produced flowers, and 5% produced fruit. Table 1 describes the study participants across the survey and in-depth interviews. The general population of beginning farmers in the region is 61.2% male; 38.8% female; 98.8% white; 1.15% Latine; 0.71% American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or multiracial; 0.24% Asian; and 0.17% Black (USDA NASS, 2017); NASS lacks gender identity options beyond male or female.

Integration of Quantitative and Qualitative Findings

We used a weaving approach to integrate themes from the qualitative analysis with descriptive quantitative findings (Fetters et al., 2013); we describe five themes related to systemic stressors and coping strategies among Midwestern beginning farmers.

Theme 1: “The Stress of Capitalism”

Participants described the challenge of running a farm in a competitive, individualistic market structure. Interviewees recounted working 80 to 90 hours a week to accomplish responsibilities; this was especially true for single operators. All participants indicated an unequal work-life balance, leading to minimal time for self-care and the sacrifice of personal relationships. “The farm has an insatiable appetite . . . it will just eat everything if you

Table 1. Demographic Characteristics of the Study Sample

Characteristic	Survey participants ($N=62$)		Interview participants ($N=20$)	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	32	51.6	9	45
Male	24	38.7	7	35
Nonbinary, transgender, two-spirit, or gender fluid	6	9.7	4	20
Race				
White	57	91.9	15	75
Black or Black and Indigenous	2	3.2	3	15
Latine	1	1.6	1	5
Asian	1	1.6	1	5
Other	1	1.6	—	—
First-generation farmer				
Yes	46	75	18	90
No	15	25	2	10

allow it” (Participant 3). “They [family] kind of understand now that, you know, they’re not gonna see me during the summer unless they come to market or come over to the farm to help” (Participant 10). The work-family strain was particularly apparent among mothers:

Yeah, it’s very stressful. Whether I want to or not, children need their mom. I breastfed both my kids. I had to pump milk in the middle of the workday. That was very challenging, because I was always, like, dehydrated, and I definitely struggled balancing motherhood and farming. (Participant 13)

Similarly, “too much to do and too little time” was the top stressor for survey respondents, with 89% reporting it as a stressor. “Not having enough person power” was the third-most-prominent stressor (79%). Table 2 summarizes the top five stressors identified by survey respondents, determined by calculating means for each item.

Competition with other farmers stymied information sharing and knowledge exchange, leading many beginning farmers to struggle when developing new skills. “It seems like I’m always reinventing the wheel. In other words, you know, maybe someone has developed a practice, and it’s worked very well for them. But it’s hard to get that information from them, even when you ask” (Participant 18). Competition with larger, more well equipped farms or corporations with “an absurd amount of wealth, capital, and lobbying power” (Participant 5) was also a stressor.

Participants explained that “the combination of acute and grinding stress can be particularly painful” (Participant 1). Grinding stress includes “wearing many different hats,” (Participant 8) or managing farming, marketing, and transportation tasks, especially when outside of one’s comfort zone. Grinding stress also includes the physical stress of farming, particularly the worry about sickness or injury. “I’m pretty much one accident away from stopping

everything that I like to do, so, and going bankrupt. So yeah, that is something that’s stressful, for sure” (Participant 19). Some discussed the intense physicality: “Early on, I lost a ton of weight . . . to the point where people were concerned about me” (Participant 15). Participants described acute stress from sudden traumatic events such as livestock injury or death, or losing an entire crop due to weather, disease, or pests.

Chronic stress, such as the grinding stress described, is associated with negative health outcomes, including anxiety and depression (American Psychological Association, 2023). The PHQ-4 measure showed that 58% of survey respondents reported mild to severe symptom burden of anxiety or depression. Additionally, 63% said these symptoms made it difficult to do work, take care of home responsibilities, or get along with people. PHQ-4 scoring suggested anxiety among 34% of respondents, which is higher than the reported 19% among U.S. adults (Anxiety and Depression Association of America, 2022b). Depression was suggested among 16% of respondents, compared to 8.4% of all U.S. adults (National Institute of Mental Health, 2022). Table 3 displays survey respondent PHQ-4 scores and categories, based on cutoff points.

There was a shared disappointment in the financial reality of farming, leading most to maintain off-farm employment for financial security and

Table 2. Mean Score and Standard Deviation of Top Farm-Stress Items

Source of stress	Mean (0 to 4 scale)	Standard deviation
Too much to do and too little time	3	1.1
COVID-19	2.6	1.2
Not enough person power on farm	2.5	1.2
Climate change	2.3	1.2
Social justice	2.2	1.2

Table 3. Patient Health Questionnaire (PHQ-4) Categories

PHQ-4 Score	N	%
Minimal (0–2)	26	42
Mild (3–5)	20	32
Moderate (6–8)	10	16
Severe (9–12)	6	10

adequate health insurance coverage. “Farmers are barely floating, especially folks who are trying to do sustainable agriculture” (Participant 5). Sixty-eight percent of survey respondents were working an off-farm job in addition to farming. While off-farm employment is a financial buffer, it also reduces the time available to work on the farm. Financial hardships exacerbated difficulties in accessing capital and land through traditional avenues. “The mental stamina that it takes to actually find and procure and then buy land takes a lot” (Participant 10). Two BIPOC participants specifically spoke to barriers in accessing loans: “I am also single, and I’m also of femme identity . . . and of Latinx origin, and so those are a couple strikes against me in terms of would I qualify for a bank loan” (Participant 2). “The banks don’t readily give, uh, finance the whole thing, with credit scores, and it can prove to be challenging” (Participant 6).

Subtheme: The farm as the cure and the cause

Participants described the therapeutic nature of working outdoors, being in the soil, or spending time with animals. They felt farm work was rewarding, providing purpose, a way to combat stress, and an outgrowth of spiritual values. “There’s nothing like digging in the dirt; that’s the greatest relief” (Participant 6). However, participants also depicted a deeply onerous reality of farming. Stories included not taking time to grieve the loss of loved ones and feeling stuck on the farm, unable to take time away. Sixty-five percent of respondents reported feeling stress from not having enough off-farm time for themselves. Several farmers used the term “roller coaster” to describe their experiences with mental health on the farm. “It [farming] has its amazing highs, but its lows are so much lower than I ever thought possible” (Participant 15). For some, the roller coaster was tied to seasonality, with summer burn-out and winter depression. For others, the roller coaster was unpredictable:

I go to the OEFFA conference and get lots of ideas, and your sail is full of wind, you have a lot of momentum. And then you go home and find bullet holes in your tunnels . . . it takes the wind out of your sails. (Participant 18)

Theme 2: Discrimination and Inequitable Access to Resources

Some interviewees described experiencing micro-aggressions, feeling invisible, or not being trusted or taken seriously as a farmer due to their identity as a woman, queer person, or person of color. Sentiments of exhaustion, loneliness, and discouragement were common:

Being queer and nonbinary, for some people in the farming community, requires a lot of explanation, and I don’t necessarily always feel the level of safety that I would like to feel . . . and so there’s sort of a shading or a hiding or, like, not being able to feel like I can be open about myself. (Participant 5)

One farmer shared an experience of sexual harassment that made her feel “unsafe as a female farmer” and affected her willingness to be on the farm alone. She stated, “I’m lucky that that’s, like, the worst thing that I can think of that, really” (Participant 8). When talking about being mistreated as an immigrant, one participant explained, “I mean, I don’t let those, those bother me because . . . to me, it’s just life” (Participant 11). Another described utilizing their faith as a way to cope with racism: “I do try to keep it spiritual because it’s best for me to keep looking through my spiritual eye and not my natural eye, because my natural . . . I could easily be offended” (Participant 6).

Women, LGBTQ+, and BIPOC respondents also expressed barriers to accessing resources or social networks. Some spoke about the legacies of racism and colonialism that prevented them from being successful:

And here, too, it’s a who-you-know game. . . . I’m trying to think of a person of color that owns a building. . . . I can’t think of one, but I can think of a lot of white folks. . . . That stresses me out. So that systemic thing, that community-level thing, is a source of stress. It’s a source of thinking hard about how to shift that. (Participant 14)

Another participant added, “How many of your queer friends actually have businesses? Not

many, because they plug into the system and they keep their head down” (Participant 20).

Theme 3: Aids and Gaps in Social Support

Social support emerged as a primary stress-coping strategy among interviewees. Respondents described the importance of emotional support from family, friends, and community members who see them fully. Instrumental support, such as help on the farm or networking at farmer events, was important. Mutual aid and social support at the farmers market were mentioned, with farmers markets described as “church” or “a big family”:

Going to the farmers markets is a really fun part of my week and is helpful in being able to chat with other farmers, and I felt like I made some pretty close friends over the past year at the market. . . . So yeah, just, like those kinds of connections were really nice to have on a weekly basis. (Participant 8)

However, the experience was starkly different and oppressive for some BIPOC or LGBTQ+ farmers: “It was, like, really challenging sometimes to participate in the farmers market fully and have people frequent their stand as much as, you know, a white farmer, for example” (Participant 14). Another participant added, “And if you look queer, they’re like, ‘I’m gonna go to the white dude because he looks like a farmer and you look like a hobo or whatever. . . . You must not know enough because you’re not a white dude’” (Participant 20).

Several participants articulated gaps in social support. Social isolation and loneliness were frequently mentioned: “But up here, it’s very isolating. I don’t have many peers doing what we’re doing” (Participant 13). Participants described how farmers are underappreciated and undervalued and how farming is not a respected career path: “We farmers are taken for granted. . . . The work that is done is not valued by society” (Participant 15). Similarly, respondents discussed their commitment to sustainable agriculture and the stress of being at odds with conventional farming practices: “This is Big Ag country. My neighbors make a living off of spraying pesticides on things. I hate that. I think they think we’re crazy; they tell us all the time”

(Participant 13). This mismatch of values weighed heavily on participants.

Interviewees shared experiences of inadequate informational support. For many, the Cooperative Extension System (USDA National Institute of Food and Agriculture [NIFA], n.d.) did not meet their unique informational needs as an alternative or small-scale farm. Other sources of support were too complicated:

As a veteran, I thought that there would be more opportunity for beginning farmers. I mean, you hear about it all the time, they sound great. I spent so much time trying to get information. . . . It ended up just failing completely. (Participant 12)

Interviewees noted that COVID-19 compounded existing challenges. One participant described how COVID made it extremely difficult to find a meat processing facility. In the survey, 84% of respondents noted COVID-19 as a source of stress, making it the second-most common stressor.

Theme 4: Rugged Individualism Perpetuates Systemic Stressors

Rugged individualism was observed in participants’ stress-coping strategies. When asked about coping, most participants noted self-reliance and listed individual mechanisms, including healthy eating, physical activity, breathing exercises, and psychological practices (e.g., practicing mindfulness, positive reframing, and creating a sense of control). Some participants described not managing their stress at all or facing barriers to stress management. Thirty-four percent of survey participants had not accessed stress or mental health support in the past year. Many associated mental health support with a “breaking point” or crisis rather than a proactive wellness approach. Others acknowledged the stress they were experiencing but did not believe it warranted any outside assistance: “This is just the way it is” (Participant 15).

Navigating the healthcare system presented barriers, including health insurance compatibility, inadequate mental health resources in rural areas, and perceptions that mental health professionals

would lack understanding of farming. Insufficient time to find resources or therapy was also an impediment. Despite these barriers, 27% of survey participants reported seeing a therapist in the past year and 40% of interviewees described experiencing therapy with a trained professional at least once in their lifetime. However, the financial cost made therapy difficult to maintain for most. “We probably spend as much on therapy as we do on groceries; it’s one of our major expenses” (Participant 1).

Social stigma was another barrier to stress coping. Participants expressed a fear of being vulnerable, difficulties in asking for help, and stigma around making time for self-care. Sixty-seven percent of male survey participants had not accessed stress or mental health support in the past year, compared to 13% of females and 17% of nonbinary or transgender survey respondents. While stigma was common among male interviewees, social stigma was expressed by participants of other gender identities as well. Overall, the farm community was described as embracing rugged individualism and “fetishizing overwork” (Participant 5).

I’m just not a huge asker of help. And especially when it comes to mental health, I’m not going to reach out publicly and ask someone for help. And so, when I can’t find what I’m needing, or know where to look, then I kind of feel a little stuck just because I’m not comfortable to reach out to people and ask.
(Participant 9)

As a result of ignoring stress or mental health challenges, participants described physical manifestations such as panic attacks, headaches, and autoimmune condition flare-ups. One participant described how she learned to pay attention to early signs of stress:

In tractor machinery, there is a cotter pin that you’ll put in that will break, and that’s to prevent something even more expensive from breaking. And if something is consistently wrong in your cotter pin, it’s so tempting to be like, “I’m just going to put a fucking steel bolt in here and this will never break again” . . . which you would never do with a tractor,

because that means that your engine is just going to shred itself to bits or whatever. So I think once you start realizing that small mental health problems are the cotter pins of your whole being, instead of being like, “Oh, I guess I’ll just cry less,” being like, “Oh . . . this is letting me know that there’s gonna be a full engine shutdown.” (Participant 1)

Theme 5: Heterogeneous Perspectives on Social Justice and Climate Change

As showcased in Table 2, climate change and social justice were among the top five systemic stressors noted by survey respondents. Seventy-nine percent listed climate change and 73% noted social justice as stressors, but interviewees had mixed responses regarding climate change and social justice.

While some interviewees explained that social justice was not a source of stress, others considered it a stressor, though for varying reasons. Some participants connected social justice with their desire for a more diverse customer base beyond their mostly white, affluent patrons. They described how locally produced food is not equally accessible. Similarly, some connected social justice with a desire to increase diversity and inclusion among agricultural producers. “We need to look at who is farming out there and really start to think about . . . how are we supporting our BIPOC or femme farmers?” (Participant 2).

Social justice makes me think of LGBTQ+ issues. . . . I know a lot of LGBTQ small farmers, and I know the kind of anxiety that they have . . . because it’s a very conservative community. They just don’t know how people are going to react if they find out that they’re gay or transgender, and that’s a big concern for me. (Participant 17)

When prompted about social justice, two respondents specifically mentioned stress from farming land that was stolen from Indigenous people. “Understanding the privilege that my husband and I have as inheriting land and being white people living on land that was occupied by Native Americans and land that was stolen, that feels really awful” (Participant 14). Many of those

concerned about social justice expressed feelings of helplessness or frustration about having insufficient time to address social justice causes.

Most interviewees identified unpredictable weather as a source of stress but did not identify climate change specifically. Some were not concerned with climate change. “I don’t see it as too bad of a thing” (Participant 10). Others described it as a major stressor: “My biggest stressor is, how do we swim in this thing? You know, you can’t go to the grocery store without destroying the planet” (Participant 7). Other participants described how climate change is beyond their control: “I decided long ago to stop worrying about climate change. I just don’t have the bandwidth” (Participant 17). One participant described how extreme weather events trigger climate-related stress: “Climate change is very serious. I feel like the planet is dying. . . . Sometimes you can forget, but it’s never far” (Participant 13).

Discussion

Our study sought to understand the systemic stressors and coping strategies of Midwestern beginning farmers. The results fill a gap in the literature related to beginning farmer stress and mental health experiences. Our sample included underrepresented transgender or nonbinary farmers, women, and farmers of color. We organize our discussion and implications by our four food justice transformative practices.

Acknowledge That Oppression Occurs

Our sample included small-scale, ecologically oriented beginning farmers with multilayered and complex experiences of stress and mental health resulting from structural oppression. We found high anxiety and depression symptom burden in our sample, consistent with Rudolphi et al.’s (2020) study showing high anxiety and depression rates among young Midwestern farmers. The overarching burden of a capitalist market structure created waves of stress in the forms of competition, work-life imbalance, social isolation, and financial strain. While not unique to beginning farmers, financial stress becomes compounded among this group due to a layering of stressors related to social position. Roles of social class and income should be

explored in future studies.

Systemic oppression also hindered beginning farmers’ stress coping. Healthcare costs are a persistent challenge for young farmers (Ackoff et al., 2022; Shute et al., 2011). Stress associated with healthcare was evident in our sample; many were uninsured or forced to rely on off-farm employment for health insurance coverage (Inwood et al., 2018). Rural interviewees frequently noted geographic barriers to care. Healthcare access in rural areas is further encumbered by longer distances and a shortage of healthcare professionals (Rural Health Information Hub, 2022).

Cultural norms of rugged individualism prevented some participants from seeking help due to social stigma or waiting for a “breaking point”; these sentiments were more common among male participants. Other farm stress studies have found similar ideological impediments, with help-seeking considered appropriate only during a crisis (Roy et al., 2014). The larger implications of rugged individualism should be considered, given that correlates of individualism, such as self-blame, have been associated with suicidality among Midwestern farmers (Bjornestad et al., 2021).

More affordable, accessible routine mental health care is needed to support beginning farmers struggling against systemic stressors. This includes comprehensive health insurance for farmers, funding for rural wellness programming, and initiatives to proactively enhance mental health literacy and lessen social stigma before issues progress to crisis.

Understand and Heal Historical and Collective Trauma Enacted by Structural Power

Our study found unique stressors among women, LGBTQ+, and BIPOC beginning farmers. These stressors limited the farmers’ social networks and access to resources and compounded their financial stress. Women and LGTBQ+ participants described additional stresses related to heteropatriarchal gender norms (e.g., not being taken seriously as a farmer or needing to balance caregiving and farm responsibilities). Other studies show parallel findings, with women bearing the additional stress of gendered work and “fighting for their place as a farmer” (Hagen et al., 2021, p. 12). Moreover, non-binary participants described “hiding” themselves,

which supports previous work that has exposed how heterosexism impacts queer farmers' willingness to be fully seen as themselves (Hoffmeyer, 2021). Ackoff et al. (2022) found that, like our sample, 63.5% of farmer respondents identify as female, nonbinary, or a gender other than cisgender male. Our BIPOC participants described stress from the legacies of white supremacy, which impacts their access to land, capital, and social networks. These experiences echo those of U.S. BIPOC farmers who encountered racial bias and discrimination when trying to participate in federal farm programs (Russell et al., 2021). Our study supplements research that suggests that women, LGBTQ+, and BIPOC farmers are not as supported by Cooperative Extension (Barbercheck et al., 2009) or government agencies (Ackoff et al., 2022; Wypler, 2019) as cisgender white men.

In solidarity with other scholar-activists (Horst & Marion, 2019; Leslie et al., 2019), we call on the USDA, Cooperative Extension, funders, and researchers to include more inclusive gender identity options in data collection endeavors to further understand the impacts of gender and sexual orientation for farmers. Staff training and farmer materials need to be inclusive of non-cisgender and/or non-heterosexual farmers. Women, LGBTQ+, and BIPOC farmer participants should be centered in USDA, Extension, and funder decision-making. Farmers serving on committees should be paid for the time and energy it takes to work with traditionally oppressive institutions.

Embody an Intersectional Approach

This study shines a light on overlapping factors of social identity that contribute to unique stressors for women, LGBTQ+, and BIPOC beginning farmers. However, current U.S. policy lacks an intersectional approach to farm stress. In April 2022, the USDA released its Equity Action Plan outlining strategies to enhance equity and access to resources for underserved communities (Vilsack & Bronaugh, 2022). In a glaring gap in its conceptualization of equitable access to resources, the plan does not acknowledge disproportionate experiences of stress among marginalized communities. Similarly, little to none of the \$95 million appropriated for the USDA's Beginning Farmer and

Rancher Development Program (USDA NIFA, 2022a) supports addressing stress or mental health, discrimination, or the impacts of historical exclusionary practices. The Farm and Ranch Stress Assistance Network was passed in the 2018 Farm Bill "to establish a network that connects individuals who are engaged in farming, ranching, and other agricultural-related occupations to stress assistance programs" (USDA NIFA, 2022b). Even so, only seven of the 50 programs funded in 2021 acknowledge efforts to meet the unique needs of farmers of color (Charles, 2022).

Recognize That Oppression and Resistance Coincide

Beginning farmers' stressors are multilayered, and interventions must be approached at multiple system levels. We find it notable that, in our sample, the top stressors are not directly farm-related but are systemic issues. Current strategies have been critiqued as being too individualistic and neglecting broader, systems-level influences (Henning-Smith, et al., 2022). Current U.S. policy and programming emphasize technical assistance among beginning farmers (Calo, 2020); however, these individual-level strategies neglect broader systems-level disparities. A systematic review of farmer mental health interventions identifies a need for interventions that address "social, environmental, and cultural factors" (Younker & Radunovich, 2022, p. 15).

Social support was identified as a key coping strategy, while gaps in social support were mentioned as major stressors. Thus, we look to social support and mutual aid as potential tactics of resistance. Networks designed for specific groups, including women, LGBTQ+, or BIPOC farmers, may aid in resisting harmful cultural norms in the agricultural community while helping participants feel less isolated. Wypler (2019) and Leslie et al. (2019) discuss how queer farmer networks bolstered LGBTQ+ farmer success. Other opportunities that create a sense of community and belonging, such as cooperatives (Liang et al., 2022) or farmers markets, may benefit beginning farmers, though dynamics of power, privilege, and identity must be considered to prevent marginalization. Future research should focus on the mental health

benefits of resistance efforts such as social support, cooperatives, and mutual aid.

Transects Across the Theoretical Framework

Climate change and social justice stressors crosscut all four food justice tenets. Literature suggests that U.S. farmers view climate change as “psychologically distant” (Clements et al., 2021, p. 12) and less concerning than socioeconomic threats (Waldman et al., 2021). Internalized capitalism and the need to survive in a competitive market structure trump seemingly distant issues such as climate change. The preponderance of USDA programs supporting individualized farm interventions to combat climate change perpetuate this attitude; collective solutions should be examined. Prokopy et al. (2015) concluded that 66% of Midwestern farmers believe climate change is happening but only 8% believe it to be anthropogenic. More recently, however, 88% of young farmers nationwide indicated they believe weather changes are correlated with climate change (Ackoff et al., 2022). Despite varying opinions, and even if not immediately palpable to farmers, future plans must integrate the strain of climate change. Warmer growing seasons are already impacting agricultural yields in the Midwest (Cosier, 2022; Hatfield, 2012) and, consequently, the U.S. food system. This can potentially aggravate other systemic issues beginning farmers already face. Likewise, the heterogeneity of social justice perspectives across our sample is an area for future exploration through an intersectional lens. The nexus of social justice perspectives and farmer stress has yet to be closely investigated but is a topic with abounding importance, given the charged sociopolitical and rural-urban divide.

Limitations

This cross-sectional study was conducted during the COVID-19 pandemic, which may have influenced responses and respondent concerns. Future longitudinal studies can provide more in-depth understanding of beginning farmer stress. The purposive sampling strategy and sensitive nature of the survey and interview content may have introduced some bias. The survey sample size was small and excluded non-English speakers, and most partici-

pants were from Ohio and Michigan. Future studies should aim for random sampling techniques for more representative results. We worked with our community partner to reword measurements and expand options for gender identity to amplify voices often excluded from food systems research; however, the modified stress scale was not validated. Future work should validate the modified scale across contexts. Our use of the term “BIPOC” may indicate an overgeneralization of a shared non-white experience and history; however, we want to emphasize the unique experiences between and among races and ethnicities. Lastly, our research team’s positionalities may have contributed to reactivity and researcher bias. Efforts were made to address this through prolonged engagement, triangulation, and peer debriefing (Padgett, 2016).

Conclusion

Beginning farmers are drawn to the Midwest to find purpose, work outdoors, and feed their community. Results from our survey and interviews reveal that the “insatiable appetite” of the farm is exacerbated by the stress of capitalism, discrimination in access to resources, challenges with social support, rugged individualism, and climate change. Farm work and social support were both coping strategies and sources of stress, revealing paradoxical elements. Future research should investigate the longitudinal effects of stress and coping mechanisms and the impact of systems-level strategies to shape structural supports for beginning farmers.



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References

- Ackoff, S., Flom, E., Polanco, V. G., Howard, D., Manly, J., Mueller, C., Rippon-Butler, H., & Wyatt, L. (2022). *Building a future with farmers 2022: Results and recommendations from the National Young Farmer Survey*. National Young Farmers Coalition. <https://www.youngfarmers.org/22survey/>
- Ahearn, M. C. (2011). Potential challenges for beginning farmers and ranchers. *Choices: The Magazine of Food, Farm & Resource Issues*, 26(2), 3–8. <https://www.jstor.org/stable/choices.26.2.09>
- Alsgaard, H. (2012). Rural inheritance: Gender disparities in farm transmission. *North Dakota Law Review*, 88(2), 347–408. <https://commons.und.edu/ndlr/vol88/iss2/3>
- American Psychological Association. (2023, March 8). *Stress effects on the body*. <https://www.apa.org/topics/stress/body>
- Anxiety and Depression Association of America. (2022a). *Anxiety disorders—Facts & statistics*. <https://adaa.org/understanding-anxiety/facts-statistics>
- Anxiety and Depression Association of America. (2022b). *What is anxiety and depression?* <https://adaa.org/understanding-anxiety>
- Arif, A. A., Adeyemi, O., Laditka, S. B., Laditka, J. N., & Borders, T. (2021). Suicide mortality rates in farm-related occupations and the agriculture industry in the United States. *American Journal of Industrial Medicine*, 64(11), 960–968. <https://doi.org/10.1002/ajim.23287>
- Arora, K., Cheyney, M., Gerr, F., Bhagianadh, D., Gibbs, J., & Anthony, T. R. (2020). Assessing health and safety concerns and psychological stressors among agricultural workers in the U.S. Midwest. *Journal of Agricultural Safety and Health*, 26(1), 45–58. <https://doi.org/10.13031/jash.13660>
- Balvanz, P., Barlow, M. L., Lewis, L. M., Samuel, K., Owens, W., Parker, D. L., Marco, M. D., Crowder, R., Williams, Y., Barker, D., Lightfoot, A., & Ammerman, A. (2011). “The next generation, that’s why we continue to do what we do”: African American farmers speak about experiences with land ownership and loss in North Carolina. *Journal of Agriculture, Food Systems, and Community Development*, 1(3), 67–88. <https://doi.org/10.5304/jafscd.2011.013.011>
- Barbercheck, M., Brasier, K., Kiernan, N. E., Sachs, C., Trauger, A., & Findeis, J. (2009). Meeting the Extension needs of women farmers: A perspective from Pennsylvania. *Journal of Extension*, 47(3), Article 3FEA8. https://archives.joe.org/joe/2009june/pdf/JOE_v47_3a8.pdf
- Berg, S. H. (2006). Everyday sexism and posttraumatic stress disorder in women: A correlational study. *Violence Against Women*, 12(10), 970–988. <https://doi.org/10.1177/1077801206293082>
- Bjornestad, A., Cuthbertson, C., & Hendricks, J. (2021). An analysis of suicide risk factors among farmers in the midwestern United States. *International Journal of Environmental Research and Public Health*, 18(7), Article 3563. <https://doi.org/10.3390/ijerph18073563>
- Brigance, C., Soto Mas, F., Sanchez, V., & Handal, A. J. (2018). The mental health of the organic farmer: Psychosocial and contextual actors. *Workplace Health & Safety*, 66(12), 606–616. <https://doi.org/10.1177%2F2165079918783211>
- Cadieux, K. V., & Slocum, R. (2015). What does it mean to do food justice? *Journal of Political Ecology*, 22, 1–26. <https://doi.org/10.2458/v22i1.21076>
- Calo, A. (2020). The yeoman myth: A troubling foundation of the beginning farmer movement. *Gastronomica*, 20(2), 12–29. <https://doi.org/10.1525/gfc.2020.20.2.12>
- Carpenter, S. (2012). The USDA discrimination cases: *Pigford, In re Black farmers, Keepseagle, Garcia, and Love*. *Drake Journal of Agricultural Law*, 17(1), 1–36. <https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2016/09/agVol17No1-Carpenter.pdf>
- Carruth, A. K., & Logan, C. A. (2002). Depressive symptoms in farm women: Effects of health status and farming lifestyle characteristics, behaviors, and beliefs. *Journal of Community Health*, 27(3), 213–228. <https://doi.org/10.1023/A:1015206224421>
- Chandra, Y., & Shang, L. (2019). Inductive coding. In Y. Chandra & L. Shang, *Qualitative research using R: A systematic approach* (pp. 91–106). Springer Singapore. https://doi.org/10.1007/978-981-13-3170-1_8
- Charles, S. (2022, March 17). Debt, racism, and fear of displacement are driving a public health crisis among Black farmers. *The Counter*. <https://thecounter.org/black-farmers-racism-public-health-research>

- Chengane, S., Beseler, C. L., Duysen, E. G., & Rautiainen, R. H. (2021). Occupational stress among farm and ranch operators in the midwestern United States. *BMC Public Health*, 21(1), Article 2076. <https://doi.org/10.1186/s12889-021-12053-4>
- Clarke, V., & Braun, V. (2017). Thematic analysis. *Journal of Positive Psychology*, 12(3), 297–298. <https://doi.org/10.1080/17439760.2016.1262613>
- Clements, R. S., Birthisel, S. K., Daigneault, A., Gallandt, E., Johnson, D., Wentworth, T., & Niles, M. T. (2021). Climate change in the context of whole-farming systems: Opportunities for improved outreach. *Climatic Change*, 166(3), Article 40. <https://doi.org/10.1007/s10584-021-03101-4>
- Cosier, S. (2022, September 12). *Midwest heave waves may cook crops—and fry harvests*. Natural Resources Defense Council. <https://www.nrdc.org/stories/midwest-heat-waves-may-cook-crops-and-fry-harvests>
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Daghagh Yazd, S., Wheeler, S. A., & Zuo, A. (2019). Key risk factors affecting farmers' mental health: A systematic review. *International Journal of Environmental Research and Public Health*, 16(23), Article 4849. <https://doi.org/10.3390/ijerph16234849>
- David, L., Dambrun, M., Harrington, R., Streith, M., & Michaud, A. (2021). Psychological and physical health of organic and conventional farmers: A review. *Sustainability*, 13(20), Article 11384. <https://doi.org/10.3390/su132011384>
- Dentzman, K., Pilgeram, R., Lewin, P., & Conley, K. (2021). Queer farmers in the 2017 US Census of Agriculture. *Society & Natural Resources*, 34(2), 227–247. <https://doi.org/10.1080/08941920.2020.1806421>
- Dyer, J. F., & Bailey, C. (2008). A place to call home: Cultural understandings of heir property among rural African Americans. *Rural Sociology*, 73(3), 317–338. <https://doi.org/10.1526/003601108785766598>
- Eberhardt, B. J., & Pooyan, A. (1990). Development of the farm stress survey: Factorial structure, reliability, and validity. *Educational and Psychological Measurement*, 50(2), 393–402. <https://doi.org/10.1177/0013164490502018>
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research*, 48(6pt2), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>
- Gilbert, J., Sharp, G., & Felin, M. S. (2002). The loss and persistence of Black-owned farms and farmland: A review of the research literature and its implications. *Journal of Rural Social Sciences*, 18(2), Article 1. <https://egrove.olemiss.edu/jrss/vol18/iss2/1>
- Glennie, C., & Alkon, A. H. (2018). Food justice: Cultivating the field. *Environmental Research Letters*, 13(7), Article 073003. <https://doi.org/10.1088/1748-9326/aac4b2>
- Gottlieb, R., & Joshi, A. (2010). *Food justice*. MIT Press. <https://doi.org/10.7551/mitpress/7826.001.0001>
- Hagen, B. N. M., Albright, A., Sargeant, J., Winder, C. B., Harper, S. L., O'Sullivan, T. L., & Jones-Bitton, A. (2019). Research trends in farmers' mental health: A scoping review of mental health outcomes and interventions among farming populations worldwide. *PLoS One*, 14(12), Article e0225661. <https://doi.org/10.1371/journal.pone.0225661>
- Hagen, B. N. M., Sawatzky, A., Harper, S. L., O'Sullivan, T. L., & Jones-Bitton, A. (2021). What impacts perceived stress among Canadian farmers? A mixed-methods analysis. *International Journal of Environmental Research and Public Health*, 18(14), Article 7366. <https://doi.org/10.3390/ijerph18147366>
- Hansen, B. G., & Østerås, O. (2019). Farmer welfare and animal welfare—Exploring the relationship between farmer's occupational well-being and stress, farm expansion and animal welfare. *Preventive Veterinary Medicine*, 170, Article 104741. <https://doi.org/10.1016/j.prevetmed.2019.104741>
- Hatfield, J. (2012). *Agriculture in the Midwest* (White paper, US National Climate Assessment Midwest Technical Input Report). U.S. Global Change Research Program. https://glisa.umich.edu/media/files/NCA/MTIT_Agriculture.pdf
- Henning-Smith, C., Alberth, A., Bjørnstad, A., Becot, F., & Inwood, S. (2022). Farmer mental health in the US Midwest: Key informant perspectives. *Journal of Agromedicine*, 27(1), 15–24. <https://doi.org/10.1080/1059924X.2021.1893881>
- Herek, G. M., Gillis, J. R., & Cogan, J. C. (1999). Psychological sequelae of hate-crime victimization among lesbian, gay, and bisexual adults. *Journal of Consulting and Clinical Psychology*, 67(6), 945–951. <https://doi.org/10.1037/0022-006X.67.6.945>

- Hinson, W. R., & Robinson, E. (2008). "We didn't get nothing": The plight of Black farmers. *Journal of African American Studies*, 12(3), 283–302. <https://doi.org/10.1007/s12111-008-9046-5>
- Hoffelmeyer, M. (2019). *Sexuality and sustainable agriculture: Examining queer farmers' quality of life in Pennsylvania*. Sustainable Agriculture Research and Education Projects. <https://projects.sare.org/project-reports/gne18-174>
- Hoffelmeyer, M. (2021). "Out" on the farm: Queer farmers maneuvering heterosexism and visibility. *Rural Sociology*, 86(4), 752–776. <https://doi.org/10.1111/ruso.12378>
- Horst, M., & Marion, A. (2019). Racial, ethnic and gender inequities in farmland ownership and farming in the US. *Agriculture and Human Values*, 36(1), 1–16. <https://doi.org/10.1007/s10460-018-9883-3>
- Inwood, S., Knudson, A., Becot, F. A., Braun, B., Goetz, S. J., Kolodinsky, J. M., Loveridge, S., Morris, K., Parker, J., Parsons, B., Welborn, R., & Albrecht, D. E. (2018). Health insurance and national farm policy. *Choices*, 33(1), 1–7. <https://www.jstor.org/stable/26487425>
- Karami, E., & Keshavarz, M. (2010). Sociology of sustainable agriculture. In E. Lichtfouse (Ed.), *Sociology, organic farming, climate change and soil science* (Vol. 3, pp. 19–40). Springer Netherlands. https://doi.org/10.1007/978-90-481-3333-8_2
- Key, N., & Lyons, G. (2019). *An overview of beginning farms and farmers* (Economic Brief No. 29). U.S. Department of Agriculture, Economic Research Service. <https://ageconsearch.umn.edu/record/301074>
- Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher*, 42(8), 846–854. <https://doi.org/10.1080/0142159X.2020.1755030>
- Kirkinis, K., Pieterse, A. L., Martin, C., Agiliga, A., & Brownell, A. (2021). Racism, racial discrimination, and trauma: A systematic review of the social science literature. *Ethnicity & Health*, 26(3), 392–412. <https://doi.org/10.1080/13557858.2018.1514453>
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics*, 50(6), 613–621. [https://doi.org/10.1016/S0033-3182\(09\)70864-3](https://doi.org/10.1016/S0033-3182(09)70864-3)
- Layman, E., & Civita, N. (2022). Decolonizing agriculture in the United States: Centering the knowledges of women and people of color to support relational farming practices. *Agriculture and Human Values*, 39, 965–978. <https://doi.org/10.1007/s10460-022-10297-3>
- Lee, R., Ahtone, T., Pearce, M., Goodluck, K., McGhee, G., Leff, C., Lanpher, K., & Salinas, T. (2020). Land-grab universities. *High Country News*. <https://www.landgrabu.org>
- Leslie, I. S. (2019). Queer farmland: Land access strategies for small-scale agriculture. *Society & Natural Resources*, 32(8), 928–946. <https://doi.org/10.1080/08941920.2018.1561964>
- Leslie, I. S., & White, M. M. (2018). Race and food: Agricultural resistance in U.S. history. In P. Batur & J. R. Feagin (Eds.), *Handbook of the sociology of racial and ethnic relations* (pp. 347–364). Springer International. https://doi.org/10.1007/978-3-319-76757-4_19
- Leslie, I. S., Wypler, J., & Bell, M. M. (2019). Relational agriculture: Gender, sexuality, and sustainability in US farming. *Society & Natural Resources*, 32(8), 853–874. <https://doi.org/10.1080/08941920.2019.1610626>
- Liang, Y., Janssen, B., Casteel, C., Nonnenmann, M., & Rohlman, D. S. (2022). Agricultural cooperatives in mental health: Farmers' perspectives on potential influence. *Journal of Agromedicine*, 27(2), 143–153. <https://doi.org/10.1080/1059924X.2021.2004962>
- Marin, M.-F., Lord, C., Andrews, J., Juster, R.-P., Sindi, S., Arsénault-Lapierre, G., Fiocco, A. J., & Lupien, S. J. (2011). Chronic stress, cognitive functioning and mental health. *Neurobiology of Learning and Memory*, 96(4), 583–595. <https://doi.org/10.1016/j.nlm.2011.02.016>
- Martin, M. J., & Hartmann, K. (2022). Intersectionality of whiteness, racism, and homophobia among agriculture students. *Whiteness and Education*, 7(1), 78–92. <https://doi.org/10.1080/23793406.2020.1839942>
- McKenna, S. A., & Main, D. S. (2013). The role and influence of key informants in community-engaged research: A critical perspective. *Action Research*, 11(2), 113–124. <https://doi.org/10.1177/1476750312473342>
- Medel-Herrero, A., Torreiro-Casal, M., Hovey, J. D., Rascon-Garcia, K., Smiley-Jewell, S., Shumway, M., & Deeb-Sossa, N. (2021). The increasing toll of racism and discrimination on California agricultural workers and their families under the Trump administration. *Ethnicities*, 21(4), 638–663. <https://doi.org/10.1177/2F14687968211018255>

- Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, 129(5), 674–697. <https://doi.org/10.1037/0033-2909.129.5.674>
- MGH Institute of Health Professions. (2022, September 7). Massachusetts General Hospital. *APA style 7th edition: Bias-free language*. <https://libguides.massgeneral.org/APA7/biasfree-language>
- Minkoff-Zern, L.-A., & Sloat, S. (2017). A new era of civil rights? Latino immigrant farmers and exclusion at the United States Department of Agriculture. *Agriculture and Human Values*, 34(3), 631–643. <https://doi.org/10.1007/s10460-016-9756-6>
- National Institute of Mental Health [NIMH]. (n.d.). *I'm so stressed out! Fact sheet*. National Institute of Health. <https://www.nimh.nih.gov/health/publications/so-stressed-out-fact-sheet>
- NIMH. (2022). *Major depression*. National Institute of Health. <https://www.nimh.nih.gov/health/statistics/major-depression>
- National Young Farmers Coalition. (2021, May 17). *2021 climate policy recommendations*. <https://www.youngfarmers.org/2021/05/2021-climate-recommendations>
- Nelson, G., Ochocka, J., Griffin, K., & Lord, J. (1998). “Nothing about me, without me”: Participatory action research with self-help/mutual aid organizations for psychiatric consumer/survivors. *American Journal of Community Psychology*, 26(6), 881–912. <https://doi.org/10.1023/A:1022298129812>
- Padgett, D. K. (2016). *Qualitative methods in social work research* (3rd ed.). SAGE.
- Plain Language Action and Information Network. (2011). *Federal plain language guidelines*. Plainlanguage.gov. <https://www.plainlanguage.gov/guidelines>
- Prokopy, L. S., Morton, L. W., Arbuckle, J. G., Jr., Mase, A. S., & Wilke, A. K. (2015). Agricultural stakeholder views on climate change: Implications for conducting research and outreach. *Bulletin of the American Meteorological Society*, 96(2), 181–190. <https://doi.org/10.1175/BAMS-D-13-00172.1>
- Roy, P., Tremblay, G., & Robertson, S. (2014). Help-seeking among male farmers: Connecting masculinities and mental health. *Sociologia Ruralis*, 54(4), 460–476. <https://doi.org/10.1111/soru.12045>
- Rudolphi, J. M., Berg, R. L., & Parsaik, A. (2020). Depression, anxiety and stress among young farmers and ranchers: A pilot study. *Community Mental Health Journal*, 56(1), 126–134. <https://doi.org/10.1007/s10597-019-00480-y>
- Rural Health Information Hub. (2022). *Healthcare access in rural communities*. <https://www.ruralhealthinfo.org/topics/healthcare-access>
- Russell, K. J., Hossfeld, L., & Mendez, G. R. (2021). “Not a new pattern”: Black farmers’ perspectives on barriers to participating in federal farm programs. *Journal of Agriculture, Food Systems, and Community Development*, 10(4), 195–209. <https://doi.org/10.5304/jafscd.2021.104.007>
- Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE.
- Santos, E. G. d. O., Queiroz, P. R., Nunes, A. D. d. S., Vedana, K. G. G., & Barbosa, I. R. (2021). Factors associated with suicidal behavior in farmers: A systematic review. *International Journal of Environmental Research and Public Health*, 18(12), Article 6522. <https://doi.org/10.3390/ijerph18126522>
- Shute, L. L., Anderson, A., Bernhardt, H., Creech, T., Fleming, S. vT., Oakley, E., & Shute, B. (2011). *Building a future with farmers: Challenges faced by young, American farmers and a national strategy to help them succeed*. National Young Farmers Coalition. <https://www.youngfarmers.org/building-a-future-with-farmers-october-2011/>
- Sprung, J. M. (2022). Economic stress, family distress, and work-family conflict among farm couples. *Journal of Agromedicine*, 27(2), 154–168. <https://doi.org/10.1080/1059924X.2021.1944417>
- Touzeau, L. (2019). “Being stewards of land is our legacy”: Exploring the lived experiences of young Black farmers. *Journal of Agriculture, Food Systems, and Community Development*, 8(4), 45–60. <https://doi.org/10.5304/jafscd.2019.084.007>
- Tyler, S. S., Rivers, L., III, Moore, E. A., & Rosenbaum, R. (2014). Michigan Black farm owners’ perceptions about farm ownership credit acquisition: A critical race analysis. *Race, Gender & Class*, 21(3/4), 232–251. <http://www.jstor.org/stable/43496994>
- Union of Concerned Scientists. (2021, April 14). *Trend toward fewer, larger farms locks out new farmers in Midwest, scientists say*. <https://www.ucsusa.org/about/news/trend-toward-fewer-larger-farms-locks-out-new-farmers-midwest-scientists-say>

- U.S. Department of Agriculture Climate Hubs. (n.d.). *Agriculture in the Midwest*.
<https://www.climatehubs.usda.gov/hubs/midwest/topic/agriculture-midwest>
- U.S. Department of Agriculture Economic Research Service [USDA ERS]. (2022, August 29). *Socially disadvantaged, beginning, limited resource, and female farmers and ranchers*. <https://www.ers.usda.gov/topics/farm-economy/socially-disadvantaged-beginning-limited-resource-and-female-farmers-and-ranchers>
- USDA National Agricultural Statistics Service [NASS]. (2017). *Table 70: New and beginning producers—Selected producer characteristics: 2017*. Census of Agriculture.
https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Ohio/st39_1_0070_0070.pdf
- USDA NASS. (2019a). *Asian producers*. 2017 Census of Agriculture Highlights, ACH17-8.
https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Asian_Producers.pdf
- USDA NASS. (2019b). *Black producers*. 2017 Census of Agriculture Highlights, ACH17-9.
https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Black_Producers.pdf
- USDA NASS. (2019c). *Female producers*. 2017 Census of Agriculture Highlights, ACH17-11.
https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Female_Producers.pdf
- USDA NASS. (2019d). *Hispanic producers*. 2017 Census of Agriculture Highlights, ACH17-10.
https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Hispanic_Producers.pdf
- USDA NASS. (2020). *New and beginning producers*. 2017 Census of Agriculture Highlights, ACH17-23.
<https://www.nass.usda.gov/Publications/Highlights/2020/census-beginning%20farmers.pdf>
- USDA National Institute of Food and Agriculture [NIFA]. (n.d.). *Cooperative Extension System*.
<http://www.nifa.usda.gov/about-nifa/how-we-work/extension/cooperative-extension-system>
- USDA NIFA. (2022a). *Beginning farmer and rancher development program*.
<http://www.nifa.usda.gov/grants/funding-opportunities/beginning-farmer-rancher-development-program>
- USDA NIFA. (2022b). *Farm and Ranch Stress Assistance Network (FRSAN)*.
<http://www.nifa.usda.gov/grants/programs/farm-ranch-stress-assistance-network-frsan>
- U.S. Department of Justice. (2011, February 25). *Department of Justice and USDA announce process to resolve discrimination claims of Hispanic and women farmers* [Press release]. <https://www.justice.gov/opa/pr/departments-justice-and-usda-announce-process-resolve-discrimination-claims-hispanic-and-women>
- Vilsack, T. J. (2009). *A new civil rights era for the USDA*. United States Department of Agriculture Office of the Secretary.
<https://www.govexec.com/pdfs/042709cdpm1.pdf>
- Vilsack, T. J., & Bronaugh, J. (2022). *USDA Equity Action Plan in support of Executive Order (EO) 13985 advancing racial equity and support for underserved communities through the federal government*. USDA Office of the Secretary.
<https://www.usda.gov/sites/default/files/documents/usda-equity-action-plan-508c.pdf>
- Waldman, K. B., Giroux, S. A., Farmer, J. R., Heaberlin, B. M., Blekking, J. P., & Todd, P. M. (2021). Socioeconomic threats are more salient to farmers than environmental threats. *Journal of Rural Studies*, 86, 508–517.
<https://doi.org/10.1016/j.jrurstud.2021.07.016>
- Wedell, K., Sherman, L., & Chadde, S. (2020). *Seeds of despair*. USA Today Network.
<https://stories.usatodaynetwork.com/seedsofdespair>
- Weingarten, D. (2018, December 11). Why are America's farmers killing themselves? *Guardian*.
<https://www.theguardian.com/us-news/2017/dec/06/why-are-americas-farmers-killing-themselves-in-record-numbers>
- White, M. M. (2018). *Freedom farmers: Agricultural resistance and the Black freedom movement*. University of North Carolina Press. <https://doi.org/10.5149/northcarolina/9781469643694.001.0001>
- World Health Organization. (2023, February 21). *Stress*. <https://www.who.int/news-room/questions-and-answers/item/stress>
- World Health Organization. (2022, June 17). *Mental health: Strengthening our response*. <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>

- Wypler, J. (2019). Lesbian and queer sustainable farmer networks in the Midwest. *Society & Natural Resources*, 32(8), 947–964. <https://doi.org/10.1080/08941920.2019.1584834>
- Yunker, T., & Radunovich, H. L. (2022). Farmer mental health interventions: A systematic review. *International Journal of Environmental Research and Public Health*, 19(1), Article 244. <https://doi.org/10.3390/ijerph19010244>

Appendix A. Farm Stress Items

Table A1. Working Conditions

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
Handling or being exposed to chemicals	☐	☐	☐	☐	☐	☐
Operating hazardous machinery	☐	☐	☐	☐	☐	☐
Noise levels around equipment	☐	☐	☐	☐	☐	☐
Farm-related accidents or injuries	☐	☐	☐	☐	☐	☐
Dust, mold, and natural materials	☐	☐	☐	☐	☐	☐
Removal of manufacturer's safety devices from equipment/absence of manufacturers' safety guards	☐	☐	☐	☐	☐	☐
Farm equipment that is inappropriately sized to your needs	☐	☐	☐	☐	☐	☐
Handling livestock	☐	☐	☐	☐	☐	☐

Table A2. Social and Geographic Factors

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
Lack of close proximity to neighbors	☐	☐	☐	☐	☐	☐
Limited social interaction opportunities	☐	☐	☐	☐	☐	☐
Distance to/from healthcare	☐	☐	☐	☐	☐	☐
Distance to/from community resources such as gathering places, and businesses	☐	☐	☐	☐	☐	☐
Lack of or limited public services (school, fire department, sanitation)	☐	☐	☐	☐	☐	☐
Lack of or limited access to the Internet	☐	☐	☐	☐	☐	☐
Farm-related tensions with nonfarming neighbors	☐	☐	☐	☐	☐	☐
Discrimination from agricultural service providers or others in the farm community	☐	☐	☐	☐	☐	☐

Table A3. Personal Finances

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
Repayment of farm loans	☐	☐	☐	☐	☐	☐
Market prices for crops/livestock	☐	☐	☐	☐	☐	☐
Market opportunities for crops/livestock	☐	☐	☐	☐	☐	☐
Financing your retirement	☐	☐	☐	☐	☐	☐
Concerns over the financial future of your farm	☐	☐	☐	☐	☐	☐
Cost of farmland	☐	☐	☐	☐	☐	☐
Input costs (fertilizers, feed, etc.)	☐	☐	☐	☐	☐	☐
Purchasing and updating equipment	☐	☐	☐	☐	☐	☐
Securing health insurance for you/your household	☐	☐	☐	☐	☐	☐
Planning for your farm's transfer to the next generation or operator (i.e. after you retire from farming)	☐	☐	☐	☐	☐	☐

Table A4. Time Pressure

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
Having too much to do and too little time	☐	☐	☐	☐	☐	☐
Not having the person-power to operate your farm	☐	☐	☐	☐	☐	☐
Not having enough time for yourself	☐	☐	☐	☐	☐	☐
Having to balance farm work with familial obligations (child care, time spent with family, etc.)	☐	☐	☐	☐	☐	☐

Table A5. Environmental Conditions

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
Crop or livestock challenges (diseases, pests)	☐	☐	☐	☐	☐	☐
Too little OR too much rainfall	☐	☐	☐	☐	☐	☐
Early and/or late killing frost	☐	☐	☐	☐	☐	☐
Erosion	☐	☐	☐	☐	☐	☐
Inadequate soil moisture levels	☐	☐	☐	☐	☐	☐
Climate change	☐	☐	☐	☐	☐	☐
Herbicide drift	☐	☐	☐	☐	☐	☐

Table A6. Current Events, Policy, and Regulations

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
National policy and trade agreements	☐	☐	☐	☐	☐	☐
Environmental regulations	☐	☐	☐	☐	☐	☐
Other state or local regulations	☐	☐	☐	☐	☐	☐
Reporting requirements and paperwork	☐	☐	☐	☐	☐	☐
COVID-19	☐	☐	☐	☐	☐	☐
Organic integrity	☐	☐	☐	☐	☐	☐
Social justice	☐	☐	☐	☐	☐	☐

Table A7. Employee Relations

	None	Very little	Some	Quite a bit	A great deal	Not Applicable
The price of compensating employees	☐	☐	☐	☐	☐	☐
Employee health insurance status	☐	☐	☐	☐	☐	☐
Employee welfare and well-being	☐	☐	☐	☐	☐	☐
Securing or hiring reliable employees	☐	☐	☐	☐	☐	☐
Keeping reliable employees	☐	☐	☐	☐	☐	☐
Conflict management among staff	☐	☐	☐	☐	☐	☐
Keeping up on employee paperwork (insurance, taxes, immigration, etc.)	☐	☐	☐	☐	☐	☐

Appendix B. Semistructured Interview Guide

1. Can you please tell me about your farm operation?

Probes: How many years have you been farming? How big is the operation? What do you raise or produce? Where is the farm located? Does anyone else help on the farm? Do you have a background in farming? First-generation farmer?

The next few questions will be about your experience of stress and mental health.

2. I'd like to hear about any experiences of stress that you have had as a farmer.

Probes: What factors contribute to your stress? What do you do to help manage your stress? Are there specific assets you can think of that help you manage your stress?

3. In the survey we administered this past fall, social justice was ranked as a major source of stress. Would you say that social justice is a source of stress for you? If so, can you expand on how?

Probes: How do you define social justice? What does it mean to you? Is discrimination in the agricultural arena a source of stress for you?

4. In the survey we administered this past fall, climate change was ranked as a major source of stress. Would you say that climate change is a source of stress for you? If so, can you expand on how?

5. Can you tell me about your experience with mental health as a beginning farmer?

Probes: Can you describe people or resources you've turned to for mental health support? Are there specific assets or trustworthy spaces in your community? Have you experienced barriers to accessing mental health resources? If so, what type?

6. How does stress or a mental health challenge impact your farming practices?

Probes: Is there a seasonality to your stress levels or state of mental health?

Let's shift gears a little bit and take a broader view of the landscape of farming.

7. Our research team is interested in the social sustainability of beginning farmers. How do you define social sustainability?

Probe: How do you define it as it relates to beginning farming?

8. What do you think needs to be in place for beginning farmers to be socially sustainable?

Probes: What might successful social sustainability look or feel like here in Ohio? What would be helpful in making social sustainability changes on your farm? What policies get in the way of social sustainability?

9. Can you think of other beginning farmers who might help us understand the landscape of beginning farmer social sustainability, stress, and mental health?

Before we close, I would like to gather some demographic information from you.

10. What is your age?

11. What is your gender identity?

12. How would you describe your race and ethnicity?

“It wasn’t built for us”: The possibility of Indigenous food sovereignty in settler colonial food bureaucracies

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Abstract

This article examines the extent to which Indigenous-led food systems and sovereignty goals, frameworks, and priorities are recognized, affirmed, and supported within the agri-food public sector. For this study, we focus on the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), but the findings and analysis have implications for settler-Indigenous relations more broadly. First, we situate Indigenous food systems and sovereignties within the context of agri-food

bureaucracies in Canada. We then present the research design, which involved 27 interviews with people working within or collaborating with OMAFRA on issues related to agricultural land use, programming, and development, and Indigenous relations and food systems. The findings are categorized into five themes: differing needs, visions, and priorities; land access, conversion, and health; representation; consultation and consent in agri-food programming; capacity building. The findings reveal major gaps in Indigenous representation, leadership, and control, and an absence of Indigenous-led planning and decision-making in the agri-food public sector. The findings further show that non-Indigenous people lack crucial

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knowledge concerning treaties and Indigenous relationships to land and stewardship, which creates ongoing and significant barriers to reconciliation. We close by discussing key barriers and opportunities for supporting Indigenous food system and sovereignty programming and ways forward for deepening settler knowledge of Indigenous issues and experiences. The perspectives shared in this study are intended to provide food system research, planning, policy, and practice with insights in order to begin to address structural injustices and better support Indigenous food sovereignty.

Keywords

Indigenous Food Sovereignty, Food Systems, Food Policy, Land Use Policy, Settler Colonialism, Governance, Consultation and Consent

Introduction

Food has long been used as a tool of colonialism in what is now known as Canada. Colonialism separated Indigenous people from their land, which has had significant implications for Indigenous governance, culture, food, and community. There are growing calls for Indigenous land and food reclamation and sovereignty as a means to mend colonial ruptures and support processes of land return and restoration. Federal and provincial governments in Canada have pursued a path of reconciliation, “based on recognition of rights, respect, co-operation, and partnership” (Department of Justice Canada, 2021, para. 1), which has thus far failed to address these calls for land return and restoration (Rotz & Kepkiewicz, 2018; Yellowhead Institute, 2019). In food and agriculture, governments have focused on better “including” Indigenous voices in state-directed and -controlled agricultural policy processes without recognizing that Indigenous peoples are willing and capable of directing and determining food system solutions that work for them (Kepkiewicz & Rotz, 2018). Meanwhile, Indigenous communities remain under-resourced relative to settler communities, with funding and programming often tied to settler-defined jurisdictions and colonial rules, outputs, and expectations of “success” (Daigle, 2018; Pasternak, 2016; Yellowhead Institute, 2019). Reconciliation rhetoric

notwithstanding, Indigenous peoples continue to be excluded from decision making concerning land and agriculture as well as environment, health, and education (Indigenous Climate Action, 2021).

In this study, we examine the relationship between the Ministry of Agriculture, Food and Rural Affairs of Ontario (OMAFRA) and First Nations communities in Ontario, but the analysis has implications and applications involving Indigenous peoples broadly; see, for instance, agricultural Crown land sales administered by agricultural ministries in Saskatchewan and Manitoba (Frew, 2023; Province of Manitoba, 2023). Our research reveals the ongoing issues and struggles Indigenous peoples face in seeking their food sovereignties and, put simply, indicates why the work of Indigenous food sovereignty is so difficult in practice. Our data illustrate issues that arise when ministries, large organizations, and governmental agencies (what we are calling “agri-food bureaucracies”) try to work with Indigenous communities: primarily, how governments continue to prioritize Western and colonial approaches to agricultural land relations and food production while undermining and contaminating Indigenous food systems (Robin et al., 2021). Currently, Indigenous peoples remain excluded from decision-making spaces. As a result, programming and funding opportunities often force Indigenous applicants into a very limited and inappropriate set of goals, guidelines, and definitions of success. While funding for new projects is often made available, there is little support for ongoing work and sustaining of programming. Furthermore, when Indigenous communities seek funding to support First Nations’ provisioning of country, traditional and/or wild game foods, it is often considered to be “outside the scope of the available funding” by food and agricultural institutions such as OMAFRA. Despite the long history of colonial control and restriction of ancestral, land-based, and wild foods, these foods still make up a significant part of the diet for many Indigenous peoples (Martens et al., 2016; Robin, 2019).

This study makes several substantial findings that will be detailed in the Results and Discussion sections. First, there are major concerns, primarily related to land contamination, privatization, and conversion, regarding OMAFRA’s understanding

and management of agri-food and forest lands, which is impacting treaty rights as well as Indigenous hunting, food growing, health, and livelihood practices. Second, Indigenous communities must navigate significant programming, jurisdiction, and legislation barriers that are unique to—and particularly difficult and time-consuming for—First Nations. First Nations receive little to no support and representation within the public sector in overcoming these barriers. Third, there are very few organizational spaces and positions within Indigenous communities dedicated to supporting food provision and security, and agriculture.

More broadly, the pervasive lack of knowledge and education opportunities on the part of non-Indigenous decision-makers and public sector personnel concerning treaties and Indigenous relationships to land and stewardship create ongoing and significant barriers to reconciliation. Rhetorical commitments to reconciliation have yet to lead to meaningful material changes in institutional structures, cultures, and priorities, such as funding commitments, knowledge building, and programming design and implementation, as well as staffing and leadership. To achieve meaningful change and reparation, the agri-food public sector must take a structural, as well as respectful, approach to knowledge, dialogue, listening, reflection, action, and relationship building with Indigenous communities.

The stories and experiences presented here are not unique to the people of First Nations participating in the study, nor are they unique to OMAFRA. Rather, they are symptoms and outcomes of the colonial relation; they shed light on the larger dynamics at work. The recommendations we offer are intended to provide food system research, planning, policy, and practice with opportunities to address structural injustices and advance Indigenous food sovereignty.

Indigenous Food Sovereignty and Agri-food Bureaucracies in Canada

At every level of government in Canada—municipal, regional, provincial, federal—departments and ministries participate in maintaining colonial land and food relations. Provincial ministries of food and agriculture are mandated to administer, advise, and support economic and land-based

activities related to food, agriculture, and rural community development. In Ontario, OMAFRA provides policy and programming support for the growth of the sector, the expansion of agri-food production, processing and value chain activity, as well as production, environmental, and economic resources for farmers and food producers (Ontario Ministry of Agriculture, Food and Rural Affairs, 2023). The Ministry offers a range of funding assistance, community development resources, and agri-food programs for farmers, processors, communities, research institutions, and organizations. They also play an important role in agricultural land-use planning and policy (OMAFRA, 2023). Therefore, while these ministries are rarely considered when analysing settler-Indigenous relations in Canada (the focus tends to be on Indigenous Services Canada), their mandates have significant implications for Indigenous land and food sovereignty.

The term food sovereignty was defined at the landmark 2007 gathering in Mali of small-scale food producers and activists from all over the world as the “right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems” (Declaration of Nyéléni, 2007). Many Indigenous scholars and land defenders have pointed out that the right to food as understood through the term food sovereignty is complex and cannot be achieved through food access alone (Coté, 2016; Robin, 2019; Whyte, 2018). Honoring sovereign Indigenous Nations’ right to food requires honoring their ongoing access to ecologically healthy and uncontaminated lands and respecting the cultural, relational, and livelihood practices that underpin their foodways (Whyte, 2018). Traditional foods such as salmon, caribou, and wild rice are “entwined with hard-to-replace qualities of relationships that comprise collective capacities” (Whyte, 2018, p. 363). Settler colonialism has deliberately obstructed these collective rights and capacities. Indigenous scholars and activists have thus established the concept of Indigenous food sovereignty in order to better highlight and assert the long and varied histories, practices, and inherent rights to hunting, harvest-

ing, and gathering that compose Indigenous food systems (Coté, 2016; Daigle, 2017; Martens et al., 2016; Morrison, 2011, 2020; Settee & Shukla, 2020; Whyte, 2018).

In order to establish settler land and food economies in Canada, colonial governments and actors sought to annihilate Indigenous foodways and restrict Indigenous nations and communities¹ from building and maintaining their food sovereignty. The establishment and imposition of settler agri-food economies was premised on the colonial project of land theft, wherein the Canadian government “gifted” unceded Indigenous lands to settler European families (Carter, 2016; Rotz, 2017). Extensive historical documentation illuminates the Indigenous land dispossession that forcibly removed Indigenous peoples from their foodways and subsistence practices (Carter, 1990, 2016; Daschuk, 2013; Harris, 2004; Hill, 2017; Krasowski, 2019; Rück, 2021). Colonial governments restricted Indigenous involvement in settler agriculture, despite formal claims that they wanted Indigenous peoples to become farmers (Carter, 1990). Several policies authorized settler land theft alongside Indigenous land, food, and cultural restrictions, including the Dominion Lands Act, the pass and reserve system, and the Métis scrip policy (Carter, 2016; Hoy, 2021; Krasowski, 2019). As a result, “Indigenous communities were no longer guaranteed local access to culturally appropriate and nutritious food” (Robin, 2019, p. 2), denying them their basic rights, sovereignty, and self-determination. A settler food economy established to benefit and serve settler peoples forced industrially produced and highly processed foods onto Indigenous communities (Coté, 2016; Desmarais, 2015; Grey & Patel, 2015; Matties, 2016; Settee & Shukla, 2020). These foods are often ecologically, locally, and culturally inappropriate, with devastating effects for Indigenous

communities in terms of high rates of poverty and food insecurity, and diabetes and other diet-related illnesses (Pal et al., 2013; Rudolph & McLachlan, 2013; Sanderson et al., 2012; Socha et al., 2012; Tarasuk et al., 2016). Amidst chronic underfunding for programming and infrastructure, and heavy restrictions on land access, cultural practices, economic activity and mobility, Indigenous peoples have been fighting to maintain and advance their foodways (Jäger et al., 2019; Morrison, 2011; Rudolph & McLachlan, 2013; Settee & Shukla, 2020). Within the context of settler colonial violence and dispossession, many scholars, activists, and knowledge holders have argued that the private property relationship to land must be transformed, and land returned and/or rematriated² in order for Indigenous food sovereignty to be meaningfully and sustainably exercised (Coulthard, 2014; Daigle, 2017; Morrison, 2011, 2020; Robin, 2019; Simpson, 2014).

Paternalism and colonial erasure continue to be key themes defining the relationship between agri-food bureaucracies and Indigenous communities in Canada (Human Rights Watch, 2020; Robin et al., 2021). The “Canadian Food System” is not a unified project, as the term suggests. Indigenous food systems and practices are diverse and distinct from the industrial model forcibly established by settlers (Coté, 2016; Robin, 2019; Whyte, 2018). Many Indigenous communities have visions and pathways for the reclamation of their food systems and well-being, but this knowledge is often ignored by colonial assumptions of what “our” Canadian food system ought to look like (Coté, 2016; Robin, 2019; Whyte, 2018). The experiences shared in this study demonstrate how ministerial perceptions and assumptions about Indigenous realities alongside bureaucratic structures and mechanisms continue to erase, exclude, and harm Indigenous communities and their initiatives.

¹ Under colonial legal orders imposed through the Indian Act, Indigenous nations have been categorized into First Nations, Inuit, and Métis groups. First Nations communities are governed through a Band Council system (630 across Canada), which has been colonially imposed, is patriarchal in nature, and does not reflect Indigenous governance, clan, and kinship systems (Coyle & Borrows, 2017; Daigle, 2016; Pictou, 2020).

² These are certainly complex and highly contextually specific processes. That said, there are a number of cases where folks are working to return, rematriate, and/or share land across North America, such as the Eastern Woodlands Rematriation Collective, White Earth Land Recovery Project, the Treaty Land Sharing Network, and Nimkii Aazhibikong, to name a few. See Yesno and Lopez (2020) for further examples.

Research Design

Conversations, consultations, and interviews with OMAFRA staff were conducted in spring 2020. From March to August 2021, 27 formal interviews were held with 16 OMAFRA staff members who work across divisions and branches that include policy, planning, and economic development, and with 11 external contacts who work in and with Ontario Indigenous communities on food and agriculture-related issues and have engaged with OMAFRA for several years. OMAFRA staff were contacted based on their role in relation to the themes and issues relevant to this research. Further recruitment occurred via snowball sampling.

In addition to the standard protocol for the research ethics board approval process, we also completed a document for “research involving Indigenous People,” which the Indigenous Research Ethics Board reviewed and approved. For external contacts, the first author reached out to Northern and Central Ontario food and farming organizations suggested by OMAFRA staff. For Indigenous participant recruitment, she connected with Indigenous colleagues, and Indigenous participants from the 2021 Indigenous Agri-Food Funders Forum located within Ontario, and reached out to staff working in several First Nations communities across Central East and Northeast Ontario. Of the total 11 external interviewees, seven were Indigenous people working on food/land issues in their communities; two were non-Indigenous, one who was working for an Indigenous organization on agriculture, and one working with several Indigenous communities on food sovereignty; the final two were non-Indigenous people working in Northern Ontario food and agriculture organizations. The Indigenous interviewees were from First Nations communities and organizations across Northern Ontario that were ratified by treaties such as James Bay Treaty No. 9, the Robinson-Huron Treaties, and the Williams Treaty territories, which encompass the territory of the Anishinaabe.

Each interview lasted one to two hours. Interviews were transcribed and analyzed using discourse and content analysis and then connected to relevant research, literature, and reports, including Provincial and Ministerial policy and programming documents such as the duty to consult with Abo-

original peoples in Ontario (Government of Ontario, 2013), the OMAFRA Inclusion Strategy (2018), the Northern Livestock Action Plan, the Agricultural Systems Approach, and several additional provincial anti-racism and inclusion strategies and reports. We distributed a draft report to staff interviewees, external contacts, and community members for their feedback and reflection. Several external participants also circulated the draft to colleagues and community members for further insights and feedback.

Results

Theme 1: Differing Needs, Visions, and Priorities

Differing needs, visions, and priorities is an overarching theme that arose through the interviews. There are significant gaps and disparities between government visions and priorities for agri-food programming and those of many Indigenous communities. Agri-food programming is often positioned through the purview of private land governance, economic development, and enterprise expansion. Indigenous food programming is thus often assessed on its potential to contribute to wider economic expansion. In effect, governments require projects to demonstrate a capacity to contribute to the dominant settler economy. Several of the subsequent issues, barriers, and concerns discussed by Indigenous interviewees were rooted in or connected to these underlying assumptions. One interviewee stated:

You have to be operating as a business [to apply for funding], and the majority of our communities, if there's an interest in agriculture and they're just getting going, it's more for the community . . . for food sovereignty. To make sure that people have food in the community as a whole, not for one person to start making a profit off of whatever they're doing. . . . At a lot of times there's a reluctance to [apply] because they just want to provide for their community, or they just want to start small.

Another interviewee shared a similar experience:

We have one community that has quite a number of maple syrup operators, but they're all doing it for their own family and for the community and not so much to supply outside the community. None of them are going to be looking to apply for funding, even though they want to improve their sugarbush or improve their building or whatever. They're not going to go jumping through those hoops because they know that they're not operating as a business and they're not going to get the funding.

In this case, a large community agri-food proposal was turned down because "it wasn't traditional [i.e., Western] agriculture, but it was using food, using animals from the wild, and using natural foods." Rather than economic development, the proposal focused on community development: "They had a number of people that do hides, and they wanted to hunt animals and then use [them], and develop the skills to make moccasins." The interviewee stated that governments and funders ought to be "more open to different types of economic initiatives. It was an economic initiative. It was something that could result in economic benefit for the community. It just didn't fit that traditional agricultural mold, so they didn't want to fund it."

Government programming and policies often restrict Indigenous Nations and communities from engaging in Indigenous governance and management models and food provisioning, such as wild game, fish, and other non-cultivated foods. Yet, those who want to participate in livestock, poultry, and dairy farming also feel excluded by the dominant agri-food sector.

One interviewee shared their experience establishing a band-owned, locally supplied grocery store: "Managing the grocery store, there's not a lot of resource sharing in the community in terms of what can this family provide, and contribute to the grocery store. . . . We're running under the hierarchy of grocery stores, like Loblaw's." Ideally, they stated, more local and wild foods and food sharing would be offered by the store. However:

[A] lot of it is food safety. A lot of people in the community consume wild game, fish,

things like that, but it's not really known how to incorporate those types of foods into a retail setting. Because they're not FDA approved, or things like that. We're left using external resources. For fresh fish, we use a local fishery that's not Indigenous owned. . . . We have to use theirs, because they go through all the testing and the packaging. . . . We have local people who run their own fisheries and sell their own fish privately on the side, but we can't necessarily put the food in the grocery store, because it's not tested.

As such, the conventional grocery store model bolsters the sale of industrial and processed foods, rather than local foods, which is the opposite direction from where many respondents said community members want to go.

The dissonance between funding guidelines and attempts to create sustainable community food initiatives on the ground illustrates how differently Indigenous communities and governmental institutions view and define "economics" and "agriculture." Interviewees pointed to larger issues of paternalism and colonial mentalities when speaking about the disconnect between government and Indigenous agri-food visions, goals, definitions, and desires:

Traditional ecological knowledge is not held at the same standard. . . . It's not recognized . . . but we're seeing the effects of spraying glyphosate. . . . We know that things like glyphosate don't break down the same way in northern soils, it's more acidic up here, it's slower, it stays around for at least three seasons. . . . It leads to so many health implications. So when we talk [about] epistemology . . . they think that their way of knowing is top dog. . . . And yet traditional ecological knowledge holds the ecology, and has the answers.

Interviewees working with Indigenous communities identified a strong need and desire for community-led food projects: "A lot of the initiatives the Lands Department in our community have done are to support and foster food sovereignty and food security through building capacity

for people to grow their own food or harvest locally, like morels, fiddleheads, or raspberries. There's a lot of that in our community that just grows wild, and they've even done wild rice." Another stated, "I want to try and incorporate Indigenous methodologies of farming in our community. I don't want people to look at big agriculture and think that's the way we need to go. We need to do things in a small way."

Many also spoke of the need for projects connecting local employment and well-being with land-based practices and stewardship, including community food growing, harvesting, and food preservation:

I want to create space to work with the land that's going to also be available to people who work in addictions and mental health, and that there's somewhere people can go and be on the land in a healthy way, in a productive way, and learn and connect on the land while they're healing. . . . My goal is to create food jobs in the community and connections to land-based jobs in this community for our people. . . . We need to make these safe spaces for people where they can reconnect . . . that all works together in the community.

The interviewee continued, "I don't want to get in the farming game. . . . I want our community to have our own food, to have our own fresh produce . . . to not have it come from the Ontario Food Terminal." But in working with the agri-food sector, "I find it's like, 'We want to convert you into farmers.' That's what we got, like, 'Can we colonize you some more this way?' Or, 'You have to do it this way,' and this 'Big Ag is the only way to go.' . . . We don't need to get into the farming game, we need to feed our nation." Agri-food policy and programming are "assimilating Indigenous folks into that [conventional agri-food] project. We've done this game before. We have a history of being amazing farmers with the shittiest implements ever, thrown in the garbage and handed down to us, and then became amazing at it, and we couldn't compete because we weren't allowed to sell it. We weren't allowed to be part of the market."

Some specific initiatives that Indigenous interviewees and their communities were developing or looking to establish included community regenerative gardens and farms, shared smokehouses, seed banks, shared harvesting programs, community or cooperative sugar bush production, and a community ice house for fishermen and game hunters. There were concerns raised, however, that agri-food policy and funders do not see such community-centered projects as viable agri-food activities. A government staff member noted, "community-centered initiatives, like community gardens or volunteer greenhouses, are not a farm and aren't considered valid. Business development resources are underpinned by a vastly different world view."

Another ministry staff member shared their understanding of Indigenous food security and sovereignty: "It's access to fresh, healthy food . . . In Indigenous communities, you have traditional Indigenous diets that some elders and, you know, there's always a component of the community, like a subculture that really does continue to embrace that." The staff member seemed to view these ideas, projects, and initiatives as marginal, and not representative of community visions and goals. When asked how government could support Indigenous food sovereignty, the staff member stated:

A Ministry populated by agricultural scientists, like dairy people and crops people and specialists, and stuff like that. What can we do to support traditional food systems? Other than respond the best way that we can if we're asked about something like food safety, right? I mean, we do have production sheets on wild rice and blueberries, and we support maple syrup production and further processing and honey and honey bees, as well as aquaculture. But at the end of the day, what can we do? I'd say the majority of the effort has to be built upon what we already do as a Ministry, which is to transfer knowledge and expand the scope of our support into Indigenous communities.

This discussion reveals several underlying assumptions regarding the role and purpose of government agri-food programming. Governments

position themselves as experts through which communities and applicants are expected to receive help. The institutional culture arguably is premised on the idea that knowledge and “solutions” must come from and be maintained within government, rather than a more collaborative and co-constructivist perspective that emphasizes support and resource sharing over knowledge transfer from one party (government) to another (clients and users). This institutional culture upholds the colonial food policies and practices that Indigenous communities are seeking to recover from. Agri-food institutions effectively discriminate against Indigenous communities by disregarding their traditions, practices, and visions of food growing and gathering. In order to support Indigenous communities, agri-food institutions must broaden their perceptions of “agriculture.”

Furthermore, the concern for those working toward Indigenous food sovereignty is that the institutional approach remains assimilative, significantly limiting the kinds of collaborations, dialogue, and projects possible for Indigenous peoples. The solution should not be for governments to internally acquire Indigenous knowledge in order to support Indigenous-led programs and projects. Rather, governments could choose to adopt a more collaborative, relationship-oriented, nonproprietary, and reciprocal approach.

Many interviewees voiced specific concerns about navigating provincial and federal agricultural and food programming, such as grant programs for new projects, crop and livestock production, storage, distribution, and enterprise development and expansion, and described instances where government staff and funders did not understand or support the unique political contexts and constraints of Indigenous communities. When reflecting on their experience attending business retention and expansion and rural economic development consultations, one participant noted “there’s no program that was actually built by us, for us.” They explained the implications:

One of my questions [for Ministry staff] was, did they have an example of these programs being successful in a First Nations community? As opposed to these big business retention and

expansion corporations that come out of municipalities. Because [municipalities] have the manpower and they source the funding and all of that stuff, which is a lot different than our funding that we get. A lot of the details of our funding are a lot more stringent and very detailed. It’s not very often that we can just spend how we need to, as opposed to how they expect us to. With the lack of resources and lack of knowledge, we get left scrambling trying to figure it out, and then we waste time and money trying to figure it out, because we don’t have the support to tell us, “This is how it could be done.” It creates issues on our end where we can’t necessarily build the tools or resources that we need, because we’re so busy trying to do it the way that they want it done.

The participant continued: “It still comes back to representation, in the sense where they didn’t really have an answer for me in terms of how this applies to a First Nations community. There could be more work done to have programs or streams that are actually built by an Indigenous consultant or Indigenous community.” Several respondents described how government ministries commonly refer them to examples and projects led by municipalities rather than “something geared towards us.” Participants connected these responses to ongoing conditions of institutional neglect and exclusion of Indigenous communities: “They actually aren’t thinking about us.”

Another interviewee clearly expressed the nature and impacts of government-directed information and programming that does not reflect or attend to Indigenous contexts, interests, or needs:

Information and knowledge is—for lack of better words—whitewashed. . . . We need that representation at that government level. Where they feel like, ‘Okay, I think they are actually on my side, they do actually want to help.’ And it’s not just another checkbox kind of thing. . . . *I definitely felt like, it wasn’t really built for me.*

Another interviewee described concerns with financial support and the ways that paternalistic approaches to Indigenous funding can impact their

work and community: “I find that we’re spending a lot of money to go back and fix things that didn’t really get done in the first place. So, it just seems redundant at times. If we want to use the funds for something else, then we have to go and ask permission, ‘Can we use this for this?’ It’s not like, ‘Okay, you spend it how you need to spend it.’” Participants described a general lack of trust and flexibility “in terms of making our own decision to make changes or adjustments in the budgets. It’s kind of always up to the higher power, whoever the funder is, you know, asking permission kind of thing.”

Theme 2: Land Access, Conversion, and Health

The interviews show that limited land access significantly hinders the ability of First Nations to engage in culturally distinct farming and food provisioning practices (e.g., hunting, foraging, ceremony enactment, and agroecology/agroforestry). One interviewee noted that Indigenous people in their community have demonstrated interest in land-based stewardship and agriculture only to find out that “they can’t actually access land.”

Specific concerns arose about government and industry interests in land conversion and privatization for agricultural development such as beef production, often in the name of food security and sustainability. Many confirmed that these developments were not aligned with, did not include, and/or would not benefit their communities:

I know that there was, or is, a policy to do with the expansion of farming land in Northern Ontario. Some of our communities had raised an issue about that, because it’s more treaty land that’s being [taken]. . . . We weren’t sure about the consultation process with how First Nations were going to be linked into that; to be consulted on any land disposition taking place as a result of that policy.

An interviewee noted that since many Indigenous communities are trying to revitalize traditional livelihood practices in their community, government projects aimed at land conversion and privatization of Crown land for agriculture would have significant negative impacts on their ability to uphold treaty rights and build food security in their

community. They connected this to broader concerns about ignorance around treaty relations and obligations:

Often people talk about Crown land, when it’s anything but Crown land. And the language matters. There’s an assumption that if it’s Crown land, that there’s an entitlement. And people don’t know that we have a nation-to-nation agreement, Treaty 9 is exactly that. There are high levels of ignorance about what that means, and high levels of ignorance about how often the treaty has been broken, and certainly not by First Nations. So that contributes to land issues and tensions. It’s rooted in ignorance, which is rooted in culture, which is rooted in these outdated belief systems.

Both ministry staff and external Indigenous interviewees asserted that non-Indigenous people lack the necessary knowledge and understanding about crucial issues, including treaty-making relations and history; the nature, role, and impacts of colonialism and the Indian Act; Indigenous worldviews and systems of land stewardship; and the differences between Crown land, colonial-administered reserve land, and traditional territories. Such ignorance has significant consequences for settler-Indigenous relations in ways that continue to impact Indigenous security and well-being.

One Indigenous participant explained that their community only recently regained their pre-Confederation harvesting rights, but that land accessibility remains a huge issue: “People really want to funnel us into this one space, into this one provincial park. To say, ‘This is where you guys hunt.’” Instead, they would prefer to build relationships with farmers and others in food production and agriculture. However, they have “no idea where to start, because there seems to be almost no relationship. It’s super-racist where we live. And I don’t know how to build that relationship.”

Several participants also described the impacts of agricultural practices, such as pesticide use, on the health of the land and the plant and animal populations needed for sustenance. A participant from a reserve surrounded by large potato farms stated, “I can see how the land is changing, and I

can see them working it too, they're depleting the soil." Another participant explained:

It's had an impact on the wild foods and the animals that graze wild foods. There has been an increase in things like measles. In the moose population, the animals are just not well. . . . We could have food security up here if ministries [and industries] quit contaminating the land that we all depend upon. . . . This assumption that as long as you have bush, you have food just isn't true, because it's not healthy. There's stuff that's going in our environment that wasn't there previously. . . . I find [it] incredibly frustrating because we're not talking about new research here. This stuff has been on the table for a long time.

This participant noted that the government's long-standing goals, priorities, perspectives, and programs have contributed to land and water contamination in ways that hinder Indigenous peoples' access to their traditional territories, food provisioning, and land-based practices, which are affirmed by their treaty rights and support their well-being.

Theme 3: Representation

Indigenous representation within agri-food bureaucracies such as OMAFRA—i.e., Indigenous staff numbers as well as having access, positioning, capacity, and leadership—was identified as a consistent gap when interacting with government ministries and staff.

None of the Indigenous interviewees had been able to connect with or establish a working relationship with an Indigenous staff member at the Ministry, which posed significant barriers when seeking information and accessing services and funding opportunities. All local agricultural advisors were also non-Indigenous people. As one interviewee explained, non-Indigenous staff lack "knowledge about the success of programs in a First Nations community," forming "a huge barrier for every community; at the government level. . . . Most of the people that give us money, or provide us with these funds are non-Indigenous. It's like trying to negotiate with someone who doesn't

really understand the concepts and the real underlying issues, aside from what's on paper."

Interviewees stated that many staff had "never even been to an Indigenous community. . . . They're just providing support based on a checklist or a standard that's the same for all First Nations. But we don't all operate the same, we all have various levels of resources and populations." Rather, consultants are often non-Indigenous, which "starts feeling like they're just trying to claw more out of us. . . . But we're already underfunded as it is, in relation to municipalities . . . and then they constantly ask, 'Well, what do you need it for?' It kind of feels like it comes down to our word against theirs."

Both staff and Indigenous interviewees connected the lack of Indigenous representation and resourcing with the absence of Indigenous-directed programming and staff support:

If the resources aren't there and we're not streamlined to the non-Indigenous community, then we just put our hands up and say, 'Okay, we got to deal with it on our own, to figure out a way to do this, to make it work for us,' which gets a little bit intimidating at times because it just doesn't always work. . . . There are a lot of gaps in the information they provide and information about the financial programming that's available. There's no real Indigenous connection yet.

In turn, several participants described instances where Indigenous-led food and agricultural project proposals were rejected or inappropriate and unattainable project revisions and timelines were proposed by funding review committees.

Theme 4: Consultation and Consent in Agri-Food Programming

Interviewees described consultation that occurred only after programs and grants had been developed and publicized, instead of a process of program co-creation or co-design. Typically, Indigenous participants were notified of or presented with program information only after it was designed and approved, often as a means of promoting the program and encouraging their application submis-

sions. Such programs are often created and designed initially to serve municipalities, and only later promoted to First Nations and Indigenous food providers. As an interviewee stated, Indigenous people need to be involved “at the very beginning of the first conversation,” from the initial conception to the opportunity to “start developing these things for ourselves.”

Indigenous interviewees described being contacted for initial meetings but with little or no follow-up. Several noted that they had not even been notified about whether governments moved ahead with plans, policies, or programming after initial meetings: “There’s always that information session conversation that happens. . . . We have those beginning conversations. And that’s it. It just disappears, our conversations are done.”

This interviewee described further concerns with public consultation and engagement processes:

It’s not just about them asking us questions and then taking that information back and developing their policy. . . . *We should be working together to develop policy.* They’re working in isolation from us. *It’s got to be more collaborative.*

Another interviewee shared their experience of the consultation process and how it impacts communities:

Every time something comes out, it’s like we have to find a way to make it work for our people. . . . There isn’t very often that consultation piece beforehand. It’s always, “Well, here’s what we have, do what you can with it.”

Others described similar experiences that point to gaps and barriers in the consultation process. They noted the need for individual communities to be directly consulted at the outset and during ongoing development:

So often, what happens is that when we first have an initial conversation with a ministry, eventually what they’ll do is they’ll end up hand-picking what Indigenous person they want to develop something. . . . If they want to

speak on behalf of us, they need to consult with us. *And that’s right from the very beginning. Right at the very beginning, the duty is there.*

As noted earlier, concerns arose about the consultation process, treaty violations, and government attempts to privatize and convert Crown land. Notably, Indigenous interviewees found that they were given little information about consultation and consent processes across ministries.

Several government staff described their own feelings of frustration when colleagues and managers often referred to Indigenous consultation as a barrier to program implementation. Others demonstrated firsthand this negative view of Indigenous participation. Reflecting on instances where treaty land rights and archeological sites require consultation, one staff member stated, “First Nations are very protective of giving up any land that they believe is theirs.” They added that in cases where the government seeks to convert lands to farmland, it can be difficult to engage in consultation if there may be some archaeological value for the First Nation, making it “impossible to move forward.” This perspective on Indigenous rights as an impediment illustrates larger problematic assumptions that settlers often have, as well as assumptions about their own obligations and responsibilities to Indigenous peoples, lands, and treaties.

Staff described a wide range of levels of knowledge and understanding of settler colonialism, Indigenous rights, treaty relations, and duty to consult. One common denominator is that they have very little experience working with Indigenous people and communities. Interviewees noted an increase in voluntary training, however, including cultural awareness training and an Indigenous relations community of practice. These have helped provide some basic competencies on Indigenous issues; nevertheless, many felt that there continue to be “huge barriers with Indigenous participation” and consultation. One participant observed that many staff members do not “understand duty to consult, they don’t understand the basics.” Interviewees noted issues ranging from lack of cultural awareness, poor resourcing, and underrepresentation, to lack of Indigenous-directed and -centered programming, funding, and support.

An interviewee stated that there is very little collective knowledge of Indigenous land claims, ownership, and consultation procedures. Even with efforts at consultation, “the accountability isn’t there.” They noted that responding to Indigenous comments and concerns often is not required. On some government projects interviewees had seen little to no Indigenous representation or consultation. In other instances, Indigenous representatives and communities were grouped into a larger list of stakeholders, including municipalities, industry, farmer associations, community organizations, and ENGOs, who were all consulted using similar methods. When asked about Indigenous consultation, one government staff interviewee stated that consultation is often “superficial. It’s not really meaningfully in the interest of the public good.” When asked about prospects for more in-depth and ongoing models of program co-creation and shared decision making with Indigenous communities, they stated that those conversations are not occurring: “There are opportunities, but not much is going on.” Some OMAFRA staff members called on government to shift institutional culture in order to advance reconciliation: “The expectation has to be different when it comes to Indigenous peoples. Because of the history of this country, things have to be different.”

Theme 5: Capacity-Building

There is little awareness on the part of non-Indigenous staff, bureaucrats, and decision-makers about the lived realities and experiences of Indigenous communities, which leads to significant resource gaps and creates barriers for Indigenous capacity building. Participants gave specific examples of resourcing and external support constraints for local projects. One interviewee explained that even when receiving referrals for their community to undertake projects, the money, capability, and resources were unavailable. As a result, “we lose the income effect in the community, because we just don’t have the proper resources, whether it’s human or physical” to lead or undertake the projects themselves.

In reference to community food system programming, an external interviewee explained, “I don’t know if OMAFRA realizes that we need a lot

more capacity at the community level to be able to encourage agriculture. It’d be great if we could have a person in each community that was devoted to agriculture . . . but we just don’t have that level of resourcing right now.” Currently, there are very few organizational resources and positions in Indigenous communities dedicated to supporting food provision, security, and agriculture. Public agri-food institutions do not typically contribute significant resources toward Indigenous advisors who are connected to their communities and understand community visions, needs, and protocols.

Internal capacity constraints are also exacerbated by bureaucratic policies and expectations, making it more difficult for Indigenous applicants to compete for agri-food funding and program resources. “Our communities don’t have the capacity to be able to even write the level of proposals required or to spend the amount of time that’s required” for most funding applications. As a result, “A lot of times they might apply, but the quality of the proposal might not be to what’s required to actually get funding. . . . Sometimes they might just decide not to apply.”

Such constraints—alongside general ignorance about Indigenous issues, and other barriers—is of particular concern when dealing with potential land dispossession due to land sale, conversion, and privatization efforts. “When there’s issues like Crown land being changed over to private or anything,” few representatives are able to “advocate on behalf of First Nations.” Such resources and supports are crucial:

Some of our communities in the territory are very small, and they don’t always have the capacity to respond in a given time frame. And they don’t have the resources to hire legal to look at the impact, if there’s archaeological or environmental impact. So, capacity is a big issue.

In turn, when “there’s a land disposition process for Crown land and our community’s supposed to get informed and they have to respond to those notices,” there are significant concerns about the capacity for Indigenous communities to

respond comprehensively and within given time-lines. In many cases, government and private institutions incorrectly assume that adequate consultation has occurred and thus land disposition can proceed. This speaks to the breadth and depth of concerns, demands, and expectations that communities have to contend with and the significant consequences that Indigenous communities may face if they do not meet institutional expectations.

Discussion and Ways Forward

A number of key themes and issues arose that suggest recommendations and ways forward for agri-food policy, programming, and community development while enabling greater support for Indigenous foodways and sovereignty.

Power, Access, and Control: Indigenous Consent, Consultation, and Land Dispossession

Indigenous peoples remain structurally excluded from decision making, where food system visioning, strategic and land-use planning, policy, and programming is discussed and implemented, which significantly impacts Indigenous treaty rights, land access, and food sovereignty. There is also a lack of Indigenous representation across the sector, especially in leadership and decision-making positions, and an absence of Indigenous-led and -directed programming, land use and agri-food planning, policy design, and advising.

Indigenous-specific consultation is also lacking across several sectors and programs, including land-use planning, policy, and economic development, to name a few. Community consultation processes must be enhanced in policy development to include a broader set of voices, and with engagement occurring much earlier on in the process. At the same time, it is crucial to emphasize the unique responsibilities that governments have with regards to Indigenous consent, consultation, and representation. Across several programs, there was a notable lack of Indigenous support or involvement. For instance, there was no involvement in research studies investigating soil carbon sequestration between forest land and converted pasture and agricultural land, there was no observed presence of Indigenous co-management approaches to stewardship and land use change, and there was general

downstreaming of consent and locally specific consultation processes concerning treaty rights issues. In particular, there is strong concern that agricultural land conversion programs would privatize Crown land without adequate Indigenous consent or consultation.

We want to note the well-established critiques of inclusion. Primarily—and we concur—it has been argued that “increased inclusion [of Indigenous, Black and other equity deserving groups] in a corrupt and broken system will do very little to change the system itself” (Walcott, 2021, p. 204). Inclusion too often requires Indigenous peoples to “bear the responsibility for change” (Gaudry & Lorenz, 2018, p. 220) and evades the more difficult work of transforming settler colonial institutions. If approached in this way, inclusion will simply co-opt Indigenous peoples into colonial projects and initiatives (Kepkiewicz & Rotz, 2018). Hence, inclusion is not an end goal, but a first step that *may* create space and opportunity for the larger systemic work to get done (Gaudry & Lorenz, 2018).

Due to the lack of substantive Indigenous inclusion and representation, institutional cultures and food system approaches tend to pigeonhole Indigenous peoples and reinforce racist assumptions. Indigenous peoples are perceived as inadequate or overly specialized farmers, despite a well-documented history of colonial exclusion, underfunding, and sabotaging of Indigenous agriculture (Carter, 1990, 2016; Daschuk, 2013). Although Indigenous farmers and communities are not monolithic, this simplistic perspective permeates bureaucratic decision making and programming. Guidelines and goals often assume that Indigenous peoples are only interested in berry or maple syrup production, or limit them to conventional farming models. Generally, enterprise-oriented projects such as aquaculture and maple syrup production can be more neatly integrated into government-approved economies, leaving little room for shared decision making and visioning or Indigenous-centered and -led project design. Instead, Indigenous food systems, projects, and programming, should be supported *on their own terms* rather than those of the government. Institutions must accept and trust the validity and ability of Indigenous-led programs

to create desirable outcomes; and these processes have to be Indigenous-led. Greater inclusion is a step toward creating conditions for Indigenous leadership and direction, but if it is not accompanied by significant shifts in institutional structure (e.g., organizational governance and decision-making, strategic planning, funding, vision and mission), it will likely lead to internal racism, burnout, and distress.

Settler Awareness: A Call for Deeper Learning

Settlers within and beyond food system regimes lack adequate understanding of what exactly Crown land is and who has jurisdiction over it, the differences between reserve land and traditional territories, and Indigenous relationships to land. More recent legal cases, inquiries, and treaty scholarship demonstrate that the common assumption about Crown land—that it can simply be privatized and sold at the will of the colonial administration—is deeply flawed and does not reflect the full treaty-making relationship (Borrows, 2010; Coyle & Borrows, 2017; Krasowski, 2019). Such issues must be revisited and clarified by ministries before land privatization is even considered.

Settler ignorance contributes significantly to stereotypes and false assumptions about Indigenous nations and communities. Beliefs that Indigenous people are deficient farmers and agriculturalists, that they receive more public resources than non-Indigenous Canadians, and that they have exceedingly narrow development interests contribute to a culture of anti-Indigenous racism across the agri-food sector. Many historical accounts and in-depth inquiries have clearly shown these beliefs to be false (Carter, 1990, 2016; Daschuk, 2013; Deloria, 1998; Yellowhead Institute, 2021), and demonstrate how colonial administrators have banned Indigenous nations from practicing their systems of law, governance, land stewardship, food provision, culture, spirituality, family, and kinship. Agri-food institutions must invest in a range of learning opportunities so that non-Indigenous people can educate themselves on these issues more deeply.

Institutions must also address the lack of willingness on the part of some staff to participate meaningfully in Indigenous issues or engage in

anti-racism and diversity work more broadly. As one interviewee stated, anti-Indigenous stereotypes have become “normalized in people’s minds,” manifesting, for example, in unchecked assumptions about Indigenous applicants:

I recall very clearly where we were reviewing applications to projects and the project analyst who was presenting the proposal from an Indigenous community said, “No, we don’t need to give them money, they get enough money already from government.”

Such ignorance allows for racist discrimination and exclusion to continue, or at best allows for inappropriate and tokenistic forms of consultation, representation, and assimilation. Another staff interviewee described the barriers and contradictions they observed in how government approaches diversity and inclusion more broadly:

All of the conversations are about OMAFRA as a workplace: diversity, inclusion. But how can we do better when everything is out of scope in terms of how we are liaising with the people of Ontario? I don’t think that we can ever get there as an organization internally, as a workplace, if we’re not looking at how we can be [racist]? . . . If we’re inclusive, and we have multicultural day, or we have our diversity, inclusion, or Indigenous peoples Lunch and Learn, that’s great. But in the meantime, if we’re not doing duty to consult, and we have systemic exclusion of farmers of color, we’re never going to be a truly inclusive and anti-racist workplace.

Policy, protocol, and language are created within a colonial and a racialized construct, so that inclusive language can never be a stand-in for establishing thorough consultation and consent protocol. and prioritizing and supporting community-led initiatives, programs, and policies. As Indigenous and racial issues are poorly understood, greater institutional training is an essential first step, but certainly not sufficient. Governments and food system actors must direct energy and resources toward establishing comprehensive con-

sent protocol and community-first principles and strategies that provide leadership and staff alike with a clear roadmap for working with communities to support and fund projects already happening, or to support communities in enacting their own visions. The roadmap itself could be established using an Indigenous advisory or council process, the structure itself to be determined collaboratively with Indigenous partners.

***Reflecting on Agri-food System Relationships:
Toward Meaningful Consent and Collaboration***

Across food system work, there are ongoing barriers to processes of Indigenous consent, consultation, and dialogue. Provincial and federal governments often engage in processes of approval-seeking, where consent is understood as a practice of information giving and notification. Engagement is thus premised on minimal legal obligations to consult, and is underpinned by a culture of risk management, turning processes of consent into consultation and downstream consultation into planning and project implementation stages, rather than during conception, design, and visioning. This translates into how public policy is developed and decisions are made. Meanwhile, staff are often unfamiliar with the nuances of consultation, which, beyond basic legal duty, has not been clearly and comprehensively articulated across the federal and provincial public sector. Currently, federal and provincial laws and policies continue to dominate the process, and Indigenous laws and points of view are largely erased. If governments intend to move away from minimal approval seeking, and toward respectful treaty relationships, non-Indigenous peoples have a responsibility to learn about and value Indigenous laws and processes.

This discussion has several significant implications for agri-food policy and practice. First, as our data indicate, notification-oriented approaches overburden already underresourced Indigenous communities. Instead, food programming, land-use planning, and development proposals ought to be initiated by governments and institutional actors only if there is clear indication from First Nations and Indigenous communities that they are interested in following up. Agri-food institutions must also consider implementing transformative changes

to their policy making, moving toward models of nation-to-nation governance, such as co-visioning and management and shared decision-making at upper institutional levels. These processes are not one-size-fits-all; they need to be established through ongoing and direct dialogue processes and collaboration with Indigenous communities. Through co-visioning processes, plans and agreements can be established with specific strategies to build Indigenous representation and capacity and to determine ways for governments and institutions to effectively support and fund community-driven food development projects. As these take time and resources, Indigenous nations must be meaningfully engaged and compensated, which must be prioritized by governments and food system institutions. As treaty people, we grasp the foundational importance of settler-Indigenous relations, Indigenous treaty rights, and sovereignty, which goes far beyond (in both nature and function) minimal legal obligations to consult.

Our results show that relationship-building is essential, and must go at the pace of trust-building and respect for Indigenous needs, circumstances, laws, and processes. As Leela Viswanathan asks, what could the relationship look like if we worked at the pace of trust rather than project timelines (Viswali Consulting, 2021)? What does it mean to slow our processes, especially in terms of development? This is essential for full inclusion and equity. Yet governments privilege quick development and land-use decisions. This is the opposite approach needed for building and maintaining trust. When assessing the extent to which meaningful consent, consultation, and engagement is pursued, it is important that agri-food bureaucracies reflect on who decides what these are. With regards to Indigenous and other equity-deserving groups, it is not up to non-Indigenous people to determine whether their process is evolving in a meaningful way for the community. Governments and institutions must more openly and proactively critique their own processes in collaboration with Indigenous people, and then replace or improve policies, practices, and protocols.

While many public staff members reflected honestly on their own ignorance and lack of engagement with Indigenous communities and

ways of life, without more consistent and structural practices of reflexivity it will continue to be difficult for non-Indigenous staff to center Indigenous goals, needs, and experiences. As one staff member reflected, “It’s overwhelming that with good intentions, one can still do harm, and things don’t get addressed. Staff are scared of legal implications.” It remains difficult to “have staff-to-staff conversations about Indigenous issues,” and there is a culture of fear of doing it wrong. This should be all the more reason for governments and institutions to reconsider their entire approach toward Indigenous consultation and collaboration. While the focus here is on government-Indigenous relations, interviewees urged a similar shift in approach regarding community consultation.

Conclusion

This study reveals very significant issues concerning how Indigenous rights, knowledge, and experiences are understood, respected, and prioritized in public agri-food and land-use policy and programming. The interviews show that Indigenous peoples remain structurally excluded from decision-making, visioning, strategic and land-use planning, policy, and programming. Moreover, there is a

dearth of Indigenous representation across the agri-food public sector, especially in leadership and decision-making positions, as well as an absence of Indigenous-led and directed programming, policy design, and advising. Insights from this research should encourage structural change and meaningful dialogue, knowledge and relationship-building, and action in the agri-food sector. This work can be undertaken through collaboration and from a place and spirit of curiosity, willingness, respect, and friendship. If done with care, accountability, transparency, and purpose, it can allow us to stand with and support the well-being and self-determination of Indigenous and non-Indigenous peoples as we move forward on these lands together. 

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References

- Borrows, J. (2010). *Canada’s Indigenous constitution*. University of Toronto Press.
- Carter, S. (1990). *Lost harvests: Prairie Indian reserve farmers and government policy*. McGill-Queen’s University Press.
- Carter, S. (2016). *Imperial plots: Women, land, and the spadenwork of British colonialism on the Canadian Prairies*. University of Manitoba Press.
- Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. University of Minnesota Press.
<https://doi.org/10.5749/minnesota/9780816679645.001.0001>
- Coté, C. (2016). “Indigenizing” food sovereignty. Revitalizing Indigenous food practices and ecological knowledges in Canada and the United States. *Humanities*, 5(3), Article 57. <https://doi.org/10.3390/h5030057>
- Coyle, M., & Borrows, J. (Eds.) (2017). *The right relationship: Reimagining the implementation of historical treaties*. University of Toronto Press.
- Daigle, M. (2016). Awawanenitakik: The spatial politics of recognition and relational geographies of Indigenous self-determination. *The Canadian Geographer / Le Géographe canadien*, 60(2), 259–269. <https://doi.org/10.1111/cag.12260>
- Daigle, M. (2017). Tracing the terrain of Indigenous food sovereignties. *Journal of Peasant Studies*, 46(2), 297–315.
<https://doi.org/10.1080/03066150.2017.1324423>
- Daigle, M. (2018). Resurging through Kishiiichiwán: The spatial politics of Indigenous water relations. *Decolonization: Indigeneity, Education & Society*, 7(1), 159–172.
<https://ips.library.utoronto.ca/index.php/des/article/download/30408/23046/71022>
- Daschuk, J. W. (2013). *Clearing the plains: Disease, politics of starvation, and the loss of aboriginal life*. University of Regina Press.
- Declaration of Nyéléni. (2007). <https://nyeleni.org/IMG/pdf/DeclNyeleni-en.pdf>

- Department of Justice Canada. (2021). *Principles respecting the Government of Canada's relationship with Indigenous peoples*. <https://www.justice.gc.ca/eng/csj-sjc/principles-principes.html>
- Deloria, P. J. (1998). *Playing Indian*. Yale University Press. <https://doi.org/10.12987/9780300153606>
- Desmarais, A. A. (2015). The gift of food sovereignty. *Canadian Food Studies / La revue canadienne des études sur l'alimentation*, 2(2), 154–163. <https://doi.org/10.15353/cfs-rcea.v2i2.115>
- Frew, N. (2023, January 24). Sask. Opposition MLA, Indigenous leaders call for halt of Crown lands auction. *CBC News*. <https://www.cbc.ca/news/canada/saskatchewan/saskatchewan-crown-land-auction-indigenous-1.6723760>
- Gaudry, A., & Lorenz, D. (2018). Indigenization as inclusion, reconciliation, and decolonization: Navigating the different visions for Indigenizing the Canadian Academy. *AlterNative: An International Journal of Indigenous Peoples*, 14(3), 218–227. <https://doi.org/10.1177/1177180118785382>
- Government of Ontario. (2013). *Duty to consult with Aboriginal peoples in Ontario*. <https://www.ontario.ca/page/duty-consult-aboriginal-peoples-ontario>
- Grey, S., & Patel, R. (2015). Food sovereignty as decolonization: Some contributions from Indigenous movements to food system and development politics. *Agriculture and Human Values*, 32(3), 431–444. <https://doi.org/10.1007/s10460-014-9548-9>
- Harris, C. (2004). How did colonialism dispossess? Comments from an edge of empire. *Annals of the Association of American Geographers*, 94(1), 165–182. <https://doi.org/10.1111/j.1467-8306.2004.09401009.x>
- Hill, S. M. (2017). *The clay we are made of: Haudenosaunee land tenure on the Grand River*. University of Manitoba Press.
- Hoy, B. (2021). *A line of blood and dirt: Creating the Canada–United States border across Indigenous lands*. Oxford University Press. <https://doi.org/10.1093/oso/9780197528693.001.0001>
- Human Rights Watch. (2020). “My fear is losing everything”: The climate crisis and First Nations’ right to food in Canada [Report]. <https://www.hrw.org/about/get-local/canada/report-my-fear-losing-everything-climate-crisis-and-first-nations-right-food>
- Indigenous Climate Action. (2021). *Decolonizing climate policy in Canada*. <https://www.indigenousclimateaction.com/programs/decolonizing-climate-policy>
- Jäger, M. B., Ferguson, D. B., Huntington, O., Johnson, M. K., Johnson, N., Juan, A., Larson, S., Pulsifer, P., Reader, T., Strawhacker, C., Walker, A., Whiting, D., Wilson, J., Yazzie, J., & Carroll, S. R. (2019). Building an Indigenous foods knowledges network through relational accountability. *Journal of Agriculture, Food Systems, and Community Development*, 9(B), 45–51. <https://doi.org/10.5304/jafscd.2019.09b.005>
- Kepkiewicz, L., & Rotz, S. (2018). Toward anti-colonial food policy in Canada? (Im)possibilities within the settler state. *Canadian Food Studies / La revue canadienne des études sur l'alimentation*, 5(2), 13–24. <https://doi.org/10.15353/cfs-rcea.v5i2.202>
- Krasowski, S. (2019). *No surrender: The land remains Indigenous*. University of Regina Press.
- Martens, T., Cidro, J., Hart, M. A., & McLachlan, S. (2016). Understanding Indigenous food sovereignty through an Indigenous research paradigm. *Journal of Indigenous Social Development*, 5(1), 18–37. <https://journalhosting.ucalgary.ca/index.php/jisd/article/view/58469>
- Matties, Z. (2016). Unsettling settler food movements: Food sovereignty and decolonization in Canada. *Cuizine: The Journal of Canadian Food Cultures / Cuizine: revue des cultures culinaires au Canada*, 7(2), Article 11. <https://www.erudit.org/en/journals/cuizine/1900-v1-n1-cuizine02881/1038478ar/>
- Morrison, D. (2011). Indigenous food sovereignty: A model for social learning. In A. A. Desmarais, N. Wiebe, & H. Wittman (Eds.), *Food sovereignty in Canada: Creating just and sustainable food systems* (pp. 97–113). Fernwood.
- Morrison, D. (2020). Reflections and realities: Expressions of food sovereignty in the Fourth World. In P. Settee & S. Shukla (Eds.), *Indigenous food systems: Concepts, cases, and conversations* (pp. 17–38). Canadian Scholars Press.
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). (2018). *OMAFRA inclusion strategy 2018/19-2021/22: Are you in?* [Internal report].
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). (2023). *Published plans and annual reports 2022–2023: Ministry of Agriculture, Food and Rural Affairs*. <https://www.ontario.ca/page/published-plans-and-annual-reports-2022-2023-ministry-agriculture-food-and-rural-affairs>

- Pal, S., Haman, F., & Robidoux, M. A. (2013). The costs of local food procurement in two northern Indigenous communities in Canada. *Food and Foodways*, 21(2), 132–152. <https://doi.org/10.1080/07409710.2013.792193>
- Pasternak, S. (2016). The fiscal body of sovereignty: To ‘make live’ in Indian country. *Settler Colonial Studies*, 6(4), 317–338. <https://doi.org/10.1080/2201473X.2015.1090525>
- Pictou, S. (2020). Decolonizing decolonization: An Indigenous feminist perspective on the Recognition and Rights Framework. *The South Atlantic Quarterly*, 119(2), 371–391. <https://doi.org/10.1215/00382876-8177809>
- Province of Manitoba. (2023). *Manitoba government announces agricultural Crown land lease auctions to be held online* [News release]. <https://news.gov.mb.ca/news/index.html?archive=&item=57438>
- Robin, T. (2019). Our hands at work: Indigenous food sovereignty in western Canada. *Journal of Agriculture, Food Systems, and Community Development*, 9(Suppl. 2), 85–99. <https://doi.org/10.5304/jafscd.2019.09b.007>
- Robin, T., Burnett, K., Parker, B., & Skinner, K. (2021). Safe food, dangerous lands? Traditional foods and Indigenous Peoples in Canada. *Frontiers in Communication*, 6, Article 749954. <https://doi.org/10.3389/fcomm.2021.749944>
- Rotz, S. (2017). ‘They took our beads, it was a fair trade, get over it’: Settler colonial logics, racial hierarchies and material dominance in Canadian agriculture. *Geoforum*, 82, 158–169. <https://doi.org/10.1016/j.geoforum.2017.04.010>
- Rotz, S., & Kepkiewicz, L. W. (2018). Settler colonialism and the (im)possibilities of a national food policy. *Canadian Food Studies / La Revue canadienne des études sur l'alimentation*, 5(3), 248–258. <https://doi.org/10.15353/cfs-rcea.v5i3.275>
- Rück, D. (2021). *The laws and the land: The settler colonial invasion of Kahnawà:ke in nineteenth-century Canada*. UBC Press.
- Rudolph, K. R., & McLachlan, S. M. (2013). Seeking Indigenous food sovereignty: Origins of and responses to the food crisis in northern Manitoba, Canada. *Local Environment*, 18(9), 1079–1098. <https://doi.org/10.1080/13549839.2012.754741>
- Sanderson, P. R., Little, M., Vasquez, M. M., Lomadafkie, B., Brings Him Back-Janis, M., Trujillo, O. V., Jarratt-Snider, K., Teufel-Shone, N. I., Brown, B. G., & Bounds, R. (2012). A perspective on diabetes from Indigenous views. *Fourth World Journal*, 11(2), 57–78. <https://www.cwis.org/fourth-world-journal/>
- Settee, P., & Shukla, S. (Eds.) (2020). *Indigenous food systems: Concepts, cases, and conversations*. Canadian Scholars Press.
- Simpson, L. B. (2014). Land as pedagogy: Nishnaabeg intelligence and rebellious transformation. *Decolonization: Indigeneity, Education & Society*, 3(3), 1–25. <http://whereareyouquetzalcoatl.com/mesofigurineproject/EthnicAndIndigenousStudiesArticles/Simpson2014.pdf>
- Socha, T., Zahaf, M., Chambers, L., Abraham, R., & Fiddler, T. (2012). Food security in a northern First Nations community: An exploratory study on food availability and accessibility. *Journal of Aboriginal Health / Journal de la santé autochtone*, 8(1), 5–15. <https://www.yumpu.com/en/document/view/11663339/food-security-in-a-northern-first-nations-community-national->
- Tarasuk, V., Mitchell, A., & Dachner, N. (2016). *Household food insecurity in Canada, 2014*. Research to identify policy options to reduce food insecurity (PROOF). <http://proof.utoronto.ca/wp-content/uploads/2016/04/Household-Food-Insecurity-in-Canada-2014.pdf>
- Viswali Consulting. (2021). Treaty relations, planning & Indigenous consultation at the City of Toronto. *EUC Seminar Series, Polishing the chain: Treaty relations in Toronto* [Youtube video]. <https://viswaliconsulting.com/public-speaking-videos/treaty-relations-planning-indigenous-consultation-at-the-city-of-toronto/>
- Walcott, R. (2021). *On property: Policing, prisons, and the call for abolition*. Biblioasis.
- Whyte, K. (2018). Food sovereignty, justice, and Indigenous peoples: An essay on settler colonialism and collective continuance. In A. Barnhill, M. Budolfson, & T. Doggett (Eds.), *The Oxford Handbook on Food Ethics* (pp. 345–366). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199372263.013.34>
- Yellowhead Institute. (2019). *Land back: A Yellowhead Institute Red Paper*. <https://redpaper.yellowheadinstitute.org/>
- Yellowhead Institute. (2021). *Cash back: A Yellowhead Institute Red Paper*. <https://yellowheadinstitute.org/resources/cash-back-a-yellowhead-institute-red-paper/>
- Yesno, R., & Lopez, X. M. (2020). Four case studies of Land Back in action – Briarpatch Magazine. *Briarpatch Magazine*. Retrieved from <https://briarpatchmagazine.com/articles/view/four-case-studies-land-back-in-action>

Surveying queer farmers: How heteropatriarchy affects farm viability and farmer well-being in U.S. agriculture

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Abstract

Qualitative studies have begun demonstrating how heteropatriarchy negatively affects queer farmer well-being and farm viability. However, quantitative surveys of farmers rarely ask questions about gender identity and sexual orientation, precluding analyses that could connect farmers' experiences to their queerness or to heteropatriarchy more broadly. In this article, we present data from one of the first surveys of U.S. queer farmers. This

article inquires: (a) What barriers to farm viability and farmer well-being do queer farmers report? (b) How are these barriers related to or influenced by gender and sexuality? (c) How, if at all, do queer farmers mitigate heteropatriarchal barriers in farming? We find that queer farmers explicitly attributed interpersonal areas of discrimination to their queerness—or rather, to heteropatriarchy—especially anticipated discrimination, social isolation, training opportunities and/or lack of skill, and family dynamics. We assert that farmers' reported challenges to farming success reflect areas of systemic heteropatriarchal oppression, especially in profitability, land access, health insurance, and affordable and/or available housing. At the same time, queer farmers turn to each other for support in navigating the heteropatri-

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archal landscape of U.S. agriculture. The top area that queer farmers found helpful for their success was LGBTQIA+ farm mentors or peers. Our findings indicate that heteropatriarchy is a central force negatively affecting queer farmers' well-being and farm viability. This research offers critical information for farmers, farming organizations, scholars, and policymakers to bolster farmers' contributions to U.S. agriculture and gain a more holistic understanding of (in)equity in U.S. agriculture.

Keywords

Farm Viability, Farmer Well-being, Food Justice, Gender, LGBTQIA+, Sexuality, Queer

Introduction

Surveys of farmers are a crucial way to gain information about the landscape of U.S. agriculture, yet surveys of farmers historically omit questions pertaining to LGBTQIA+ identities. The U.S. Department of Agriculture's (USDA) Census of Agriculture is the most comprehensive database of U.S. agriculture used to guide policymaking. Nevertheless, this survey limits gender to male and female categories and does not inquire about sexual orientation. Increasingly, practitioners, agricultural organizations, policymakers, and researchers look to better account for the involvement of queer (non-cisgender and/or nonheterosexual) farmers and understand how heterosexism and cissexism shape U.S. agriculture. For example, in preparation for the 2027 USDA Census of Agriculture, the National Agriculture Statistics Service (NASS) added sexual orientation and gender identity questions—including a transgender option—to the 2021 Farmer Producer Study to assess how these questions would impact the response rate of the nationwide census (Young & Rater, 2022). These questions are essential for understanding inequity in agriculture. Yet, responses to this data collection often utilize reductionist rhetoric. They reject the understanding that sexual orientation and gender shape involvement in agriculture, farmers' viability, and socio-environmental outcomes associated with agricultural production. For example, Missouri senator Josh Hawley tweeted:

MO [Missouri] farmer sent me Biden Admin's latest farm producer survey. It asks such important questions for farming as whether farmers identify as transgender, the gender they were at birth, their sexual orientation. For Joe Biden, even farming is about advancing his woke agenda. (Hawley, 2022)

In this tweet, Hawley, a right-wing conservative and former Missouri attorney general, renounces collecting data on farmers' gender and sexual identity as part of the "woke agenda." This satirical and derogatory term has been popularized in conservative discourse to describe performative political actions aimed at advancing racial and social justice. Hawley's dismissal of the need for this type of data collection illustrates a common issue in agricultural research and scholarship: a lack of understanding about how cissexism and heterosexism influence agriculture, including who farms in the United States. This study aims to address this gap in knowledge.

Through a survey of queer farmers, this article inquires: (a) What barriers to farm viability and farmer well-being do queer farmers report? (b) How are these barriers related to or influenced by gender and sexuality? (c) How, if at all, do queer farmers mitigate heteropatriarchal barriers in farming? These research questions informed survey questions designed to elucidate how queer farmers develop farm viability by accessing farming necessities, given the heteropatriarchal structure of farming in the U.S.

By investigating these research questions, this article contributes to an understanding of how social power impedes historically marginalized groups from fully engaging in the agrifood system: a central question of the food justice movement and scholarship (Leslie & White, 2018; Smith, 2019). Quantitative studies in agriculture have yet to fully consider queerness as a dimension of social power. Further, since farming organizations create resources based on survey data, the underrepresentation of LGBTQIA+ farmers in such surveys may perpetuate heteropatriarchal dominance in the agrifood system by erasing and neglecting queerness as an indicator of equity. Data on this subset of the farming community better enables outreach efforts

to tailor resources to this group's unique experiences and barriers. Thus, survey data on LGBTQIA+ farmers is crucial for further bolstering farmers' contributions to U.S. agriculture and gaining a more holistic understanding of (in)equity in U.S. agriculture.

Literature Review

To our knowledge, only two nationwide surveys have sought to capture queer people's participation in agriculture prior to the USDA's Farmer Producer Survey in 2021. First, the 2017 National Young Farmer Coalition's (Young Farmers) survey inquired about gender identity beyond the USDA's traditional male or female categories; 1% of the sample identified as transgender. However, Young Farmers did not use the transgender category for analytical purposes. Further, the 2017 Young Farmers survey did not contain questions about farmers' sexual identities (Ackoff et al., 2017). This article focuses on the second survey accounting for queer farmers, which expanded beyond basic accounting to understand the impact of cissexism and heterosexism more fully in farming. To our knowledge, this is the first survey to do so.

The rarity of counting queer people in agricultural studies and surveys thwarts understandings of a farming population's barriers and successes. A better understanding could coalesce into policies and funding that support the group's well-being and farm viability. Examining the trajectory of women in agriculture illuminates this process. Before 1978, the USDA Census of Agriculture did not ask about farm operators' gender (Pilgeram et al., 2020). When surveys began to inquire about gender, researchers and policymakers gained information on the number of women farmers and how gender-based discrimination impacted their success. For example, researchers learned that lenders and educators take women less seriously than men in agriculture, limiting women farmers' financial viability and training opportunities (Sachs et al., 2016). Researchers also identified how women farmers sought to alleviate sexist barriers by entering smaller-scale, high-value production that required less land and capital input; joining women's agriculture networks; and attending women-centered agricultural training (Sachs et al.,

2016). Today, the USDA considers "women" to be a special category when providing loans and trainings in order to inhibit gender-based discrimination in agriculture. The trajectory of women farmers in surveys—from accounting for their presence to learning about successes and challenges, in turn informing supportive policies—highlights the significance and impact that surveys accounting for queer farmers may yield.

Existing research likely both undercounts queer farmers and underreports cissexism and heterosexism. Although the 2017 USDA Census of Agriculture data did not ask about gender identity and sexual orientation, Dentzman et al. (2021) attempted to use this data set to count men married to men and women married to women among two-producer farming operations, identifying 23,701 of these farmers. This count did not include queer farmers who were not married, queer farmers with more than two producers operating the farm, transgender farmers, queer farmers who might be married to someone of another sex, or queer farmers who did not fill out the Census of Agriculture. Notably, the Census of Agriculture only includes farm owners. Given wealth disparities between cisgender heterosexual and queer people (DeFilippis, 2016), it is more likely that queer farmers are workers rather than owners. Even existing qualitative studies oversample farm owners, farmers who are currently practicing the profession, and white farmers, a privileged segment of the queer farmer population (Hoffelmeyer, 2021; Leslie, 2017, 2019; Wypler, 2019). Thus, existing studies likely underreport the number of queer farmers and the extent of cissexism and heterosexism in agriculture.

Despite this underreporting, qualitative studies have found examples of interpersonal cissexism and heterosexism in farming. For example, Hoffelmeyer (2021) found that a transgender woman was forced to leave her farming operation over safety fears due to harassment from a transphobic neighbor. Leslie (2017) uncovered a case in which a family reneged on their child's succession plan to take over the farm after learning that he was gay. While these are two overt examples of the heterosexism that queer farmers have experienced, simply the anticipation of discrimination and heterosexism is

omnipresent in queer farmers' decisions on where, how, and with whom to farm (Cramer, 2020; Hoffmeyer, 2021; Leslie, 2017; Wypler, 2019).

Cissexism and heterosexism in agriculture not only occur through interpersonal interactions but also through the less visible but pernicious systemic processes that affect farm viability. Land, labor, credit, and knowledge are among the top challenges for farmers (Ackoff et al., 2017; Leslie, 2019). Research has found that cissexism and heterosexism in agriculture influence each of these challenges to farm viability, including land, labor, credit, and knowledge (Cramer, 2020; Dentzman et al., 2020; Hoffmeyer, 2021; Leslie, 2019; Wypler, 2019). For example, while rural land is often the most affordable and best suited for farming, queer people often expect to encounter discrimination—but not queer community—in rural areas, discouraging queer farmers from pursuing land access in the countryside (Hoffmeyer, 2021; Leslie, 2019). Whereas many heterosexual farmers often access land and labor through an intimate or sexual partner in a “family farm” (Pilgeram and Amos, 2015), queer farmers are often sidelined in this model of farming due to the challenge of finding rural and/or queer partners and incongruence between the “family farm” model and queer chosen families (Leslie, 2019). Credit is critical for turning land into a viable farm, yet queer people experience higher rates of poverty and job discrimination and have overall lower credit scores (Badgett et al., 2019; McFadden, 2020; Watson et al., 2021), thereby exacerbating related challenges, such as student loan debt, experienced by other farming subpopulations, especially young farmers (Ackoff et al., 2017). Queer farmers struggle to find safe places to learn to farm (Cramer, 2020; Wypler, 2019), leaving publicly visible queer-owned farms with an overwhelming number of queer job applicants (Bell et al., 2020).

Systemic cissexism and heterosexism further occur in health, housing, and market access, three other key areas of farm viability. For example, farmers and those in the LGBTQ+ community experience disproportionately high suicide rates (Behere & Bhise, 2009), yet healthcare services that cater to queer-specific health needs are few and far between, especially in rural areas and farming com-

munities (Rosenkrantz et al., 2017; Wypler & Hoffmeyer, 2020). Finding housing on or near the farm that is both safe and affirming is all too rare, and family farm housing can rarely accommodate less-heteronuclear queer chosen families (Leslie, 2019; Leslie et al., 2019). Moreover, when queer farmers go to sell their products, many feel pressured to temper their outness for fear of losing business (Hoffmeyer, 2021; Leslie, 2017).

In sum, qualitative research suggests that queer farmers experience systemic discrimination in these critical areas of farm viability: land, labor, credit, knowledge, health, housing, and market access. While qualitative research can uncover the existence of these processes, we need quantitative research to measure their prevalence. In addition to queer farmers' perceptions of their own experiences of cissexism and heterosexism, quantitative research must inquire about areas of farm viability to uncover the—often less visible—systemic cissexism and heterosexism in agriculture.

Applied Methods

Survey Design

This survey was developed in the spring of 2019 through an adaptation to the Young Farmers 2017 survey (Ackoff et al., 2017). While Young Farmers surveyed farmers and inquired about gender identity (beyond the USDA's male or female sex categories) in 2017, this survey did not ask about sexual orientation. As such, the current study contains adapted questions relating to farmers' demographics, land access, markets, and challenges. It specifically orients these questions to queer farmers in the United States, including their identities and experiences. Young Farmers provided their original survey tool, containing 75 questions. Co-author Jaclyn Wypler recreated the original survey in Qualtrics, including all questions, response categories, and skip patterns. Wypler made minor adjustments to some questions for clarity and bias, rewording questions about “challenges” to be “issues.” They also adjusted the adapted survey to better capture seasonal work on farms. The goal was to gain a more holistic understanding of queer farmers' involvement in agriculture not limited to current farm ownership.

Wypler further adapted the Young Farmers' survey to reflect queer people and queer experiences. For example, based on their multiyear ethnographic fieldwork with queer farmers, Wypler adjusted response options to existing questions to reflect LGBTQIA+ experiences. The gender demographics response categories were expanded from "male, female, transgender, prefer not to answer" to "agender, cisgender man, cisgender woman, genderqueer, nonbinary, transgender man, transgender women, two-spirit, prefer not to share, other (please specify)." The adapted survey also included the following note: "cisgender refers to sex assigned at birth and gender identity aligning; for example, someone assigned male at birth and identified as a man." The adapted survey also inquired about sexual orientation with the following options: "asexual, bisexual, gay, straight (heterosexual), lesbian, pansexual, queer, questioning or unsure, same-gender-loving, prefer not to share, other (please specify)."

After making initial changes to the Young Farmers survey, Wypler made revisions based on two rounds of feedback from a four-person farmer advisory board. The farmer advisory board included four cisgender women of different races/ethnicities: biracial, Black, Latinx, and white. Each board member owned or worked on a farm in the U.S. and was based in California, Maine, or Pennsylvania. Additionally, Wypler received feedback at several stages from co-authors Hoffelmeyer and Leslie. Before launching the survey, the advisory board, co-authors, and consulting farmers tested the finalized survey for flow, length, and content.

Survey distribution began at the end of February 2020. The survey outreach language explicitly stated that the survey was intended for aspiring, current, or former farmers who identify as LGBTQIA+. The survey invitation was sent via the Young Farmers LGBTQ+ affinity group; Young Farmers chapters nationwide; Young Farmers survey partners, which include farming organizations nationwide; online listservs; a Facebook group for queer farmers; and additional targeted outreach to farmers of color and farm-worker organizations (19 in total). Distribution paused due to the onset of the COVID-19 pandemic and relaunched in May 2020. The survey

closed on October 18, 2020.

We collected 212 survey responses. After reviewing for completion, we deemed a total of 188 responses sufficient for analysis based on the percentage of the survey completed and if participants reported their gender and sexuality. Responses were first cleaned in Microsoft Excel by an undergraduate assistant and then transferred to STATA for analysis.

Participant Characteristics

The survey collected individual demographic information. Table 1 details participants' demographics (race, ethnicity, gender, and sexual orientation). While relying on discrete categories, this survey adopted a queer theory-informed approach to gender and sexuality by asking respondents to select all that apply, thereby prioritizing respondents' self-identification (Keller, 2015; Patterson, 2019).

For relationship status, respondents selected all that applied, including single ($n=43$), would like to date but lack opportunities ($n=24$), dating ($n=41$), in a non-monogamous relationship or relationships ($n=44$), in a monogamous relationship ($n=64$), married ($n=33$), and divorced ($n=12$). Regarding disability/ability status, respondents selected all that applied, including "I do not identify with a disability or impairment" ($n=99$), mental health disorder ($n=62$), learning disability ($n=24$), sensory impairment ($n=16$), long-term medical illness ($n=11$), temporary impairment ($n=10$), mobility impairment ($n=7$), neurological disease/disorder ($n=2$), and other ($n=12$).

Overall, the participant characteristics demonstrate that the sample was predominately white of non-Hispanic origin. The sample included higher rates of cisgender women and nonbinary farmers, with cisgender men and transgender farmers less represented. Of those reporting a disability, 43% reported a mental disability such as depression and anxiety. Finally, 65% were between 18 and 34 years old, 28% were between 35 and 54 years old, and 6% were 55 or older. Additionally, nearly 80% of the sample reported their highest education level to be a bachelor's degree, master's degree or equivalent, or doctorate or equivalent. As such, young, educated farmers are heavily represented in this sample.

Table 1. Demographic Characteristics of the Sample

Characteristic	Frequency
Race	
White	167
More than one race	17
Asian	1
Black or African American	1
Other/Prefer not to share	2
Ethnicity	
White, non-Hispanic	177
Hispanic, Latinx, or Spanish origin	11
Gender (select all that apply)	
Cisgender woman	90
Nonbinary	56
Genderqueer	47
Cisgender man	20
Transgender man	10
Agender	5
Two-Spirit	2
Transgender woman	0
Other/Prefer not to share	17
Sexual Orientation (select all that apply)	
Queer	121
Bisexual	53
Lesbian	50
Gay	45
Pansexual	32
Same-gender loving	11
Asexual	11
Questioning or unsure	7
Other/Prefer not to share	7

Farm Characteristics

This survey offers a more holistic perspective of farmers by including current, former, and aspiring farmers. When allowed to select from these three options, 162 of the 188 respondents reported they were currently farming, 21 were aspiring farmers, and 16 were former farmers. Among the former farmers, 13 had stopped farming in the past 10 years. Utilizing a more capacious understanding of

the “farmer” identity, this survey aimed to understand the mechanisms that facilitate farm exit and entry, which can be shaped by gender and sexuality (Wypier, 2019). However, due to the low sample size of former and aspiring farmers, this analysis centers the experiences of queer farmers who are currently farming.

Among current farmers, the majority of participants learned to farm by working on a farm ($n=120$), potentially diverging from more traditional ways of gaining farm knowledge by growing up on farms. Other common education channels included farm conferences or workshops ($n=71$), community gardening ($n=53$), apprentice programs ($n=48$), and a higher education program ($n=36$).

The survey conceptualized the farmer identity as including both farm owners and workers, recognizing that farm ownership alone does not capture the diverse array of characteristics that compose farmer identity (Leslie & White, 2018). As such, the survey captured participation beyond ownership. The majority of respondents ($n=79$) identified as farmworkers, while 62 identified as farm owners and 26 as farm managers. Among farmworkers, 48 received hourly wages, and seven received a salary. Among apprentices ($n=23$), 13 received hourly wages and education, and 10 received a stipend. A smaller number ($n=9$) were unpaid, and three were in an agricultural program in which they paid for the experience. Regarding farm and business partners, 39 farmed with a family member(s), 54 with a current or former romantic partner(s), 37 with longtime friends, and 76 with others, such as volunteers.

In terms of farm size, 85% of the current farmer respondents farmed less than 51 acres. Finally, current farmers reported farm products including vegetables ($n=114$), livestock ($n=130$), flowers ($n=73$), fruits and nuts ($n=66$), value-added products ($n=35$), and field crops and small grains ($n=32$). Further, three respondents reported only one product, which in all cases was flowers. As such, the majority of farms were diversified in their production.

In sum, farm characteristics show that the sample included both farmworkers and farm owners. Farm owners represented nearly 34% of the sample. Farmworkers, including apprentices,

interns, and volunteers (paid or unpaid) represented 43% of participants, while 14% of participants were hired farm managers or in other positions (8%). The majority of farms in this sample were under 51 acres and produced more than one product.

Results and Discussion

In order to understand the barriers that farmers face in operating a successful farm, we first took stock of the farmers' reported issues and challenges. Next, we explored the degree to which these issues were reported as creating challenges for their farming career. Finally, we explore the

resources that queer farmers reported as beneficial to supporting their farming livelihood.

Barriers to Viability and Well-being

The survey inquired about the most significant challenges these farmers face as well as any issues they have encountered due to their gender or sexuality. As Table 2 illustrates, farmers drew clear parallels between their queerness and anticipated discrimination, social isolation, training opportunities and/or lack of skill, family dynamics, and business skills/or business planning. Anticipated discrimination was the top issue farmers encountered due to their queerness, with 72.3%¹ of respondents

reporting this issue. This finding illuminates how queer farmers, even if not currently experiencing discrimination, expect discrimination due to their queerness from their community members, customers, other farmers, and/or service providers in agriculture. Coupled with the high rate of social isolation reported (36.6%), queer farmers in this survey face significant deterrents to entering and remaining in farming. Results also suggest that cis-sexism and heterosexism exist in places where farmers learn about agriculture, as 27.7% of respondents reported training opportunities and/or lack of skill to be a challenge encountered due to queerness. Further, queer farmers reported experiencing issues with family dynamics at a rate of 25%. The process of biological family rejection is also well-documented in broader queer literature (Hailey et al., 2020; Newcomb et al., 2019; Weston, 1997). Qualitative research suggests that the procession of intrafamily succession planning, a cornerstone for many beginning farmers, likely hampers queer farmers (Leslie, 2019). Queer farmers reported encountering issues surrounding accessing housing, health insurance, and land

Table 2. Challenges Encountered Due to Queerness

Response Categories	Frequency (n)	Percent
Anticipated discrimination	81	72.3%
Social isolation	41	36.6
Training opportunities and/or lack of skill	31	27.7
Family dynamics	28	25
Business skills and/or business planning	15	13.4
Affordable and/or available housing	13	11.6
Health insurance	13	11.6
Land access	13	11.6
Labor	10	8.9
Competition	8	7.1
Personal health or age	8	7.1
Market access	8	7.1
Other	7	6.3
Credit access	5	4.5
Discrimination based on race, ethnicity, or country of origin	4	3.6
Farm debt	3	2.7
Appropriate technology	3	2.7
Student loan debt	3	2.7
Childcare	2	1.8
Profitability	2	1.8
Health of a family member	2	1.8
Taxes	1	0.9
Water	1	0.9

Note: Respondents could choose multiple responses. Any options with none selected were excluded from table.

¹ All percentages reported in the results and discussion section are based on the total respondents who answered that specific question.

(11.6% each), demonstrating that some queer farmers view heteropatriarchy as affecting these basic necessities in farming.

When queer farmers selected their most significant challenge to farm successfully, these results differed from issues respondents directly tied to their queerness. As Table 3 shows, profitability (12.9%) and land access (11.6%) were the most significant issues for farmers. However, we argue that although respondents did not consider their most significant challenge and the challenges encountered due to queerness at the same rates, structural cissexism and heterosexism may impact profitability and land access as well. Existing research outlines how heteropatriarchy negatively affects land access for queer farmers (Leslie, 2019). Profitability reflects the most prominent barriers farmers encounter to their farming success. Existing research demonstrates that heteropatriarchy exacerbates the challenges identified in this survey—land, labor, health insurance, and affordable and/or available housing—for queer farmers (Hoffelmeyer, 2021; Leslie, 2019; Leslie et al., 2019; Wypler, 2019).

Degree of Barriers to Viability and Well-being

To further elucidate the barriers to farmer viability and well-being, the survey asked respondents to indicate the degree of each challenge that they faced as “not a challenge,” “somewhat a challenge,” or a “significant challenge.” Figure 1 delineates these results. Respondents most frequently reported the following to be significant challenges: health insurance (47.3%), affordable/available housing (41.2%), land access (31.5%), student debt (29.8%), and isolation (26.5%). These results highlight the most intense barriers for queer farmers.

However, these difficulties change when considering areas that were “somewhat a challenge.” The top five shifted to include “lack of business skills

or business planning” (57%), “pests/disease” (53.4%), “expenses” (50.4%), “market access” (50%), and “anticipated discrimination” (49.3%).

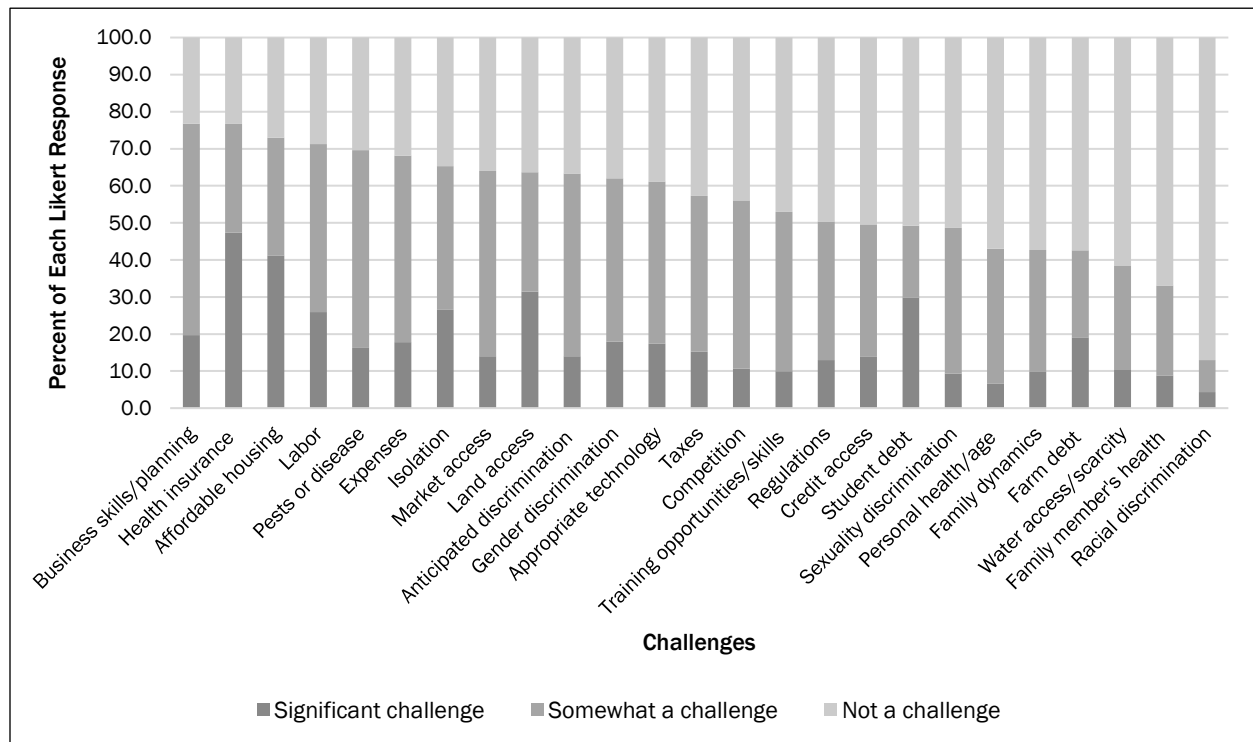
Among the challenges—including those that were “significant” and “somewhat a challenge”—lack of business skills or business planning was the top issue, followed by health insurance and affordable housing. All farmers share some challenges, but when considering the role of heteropatriarchy, these issues may become exacerbated for queer farmers. For example, when considering business

Table 3. Queer Farmers' Most Significant Challenge

Response Categories	Frequency (n)	Percent
Profitability	19	12.9%
Land access	17	11.6
Affordable and/or available housing	10	6.8
Health insurance	10	6.8
Labor	10	6.8
Social isolation	9	6.1
Other	9	6.1
Student loan debt	7	4.8
Personal health or age	6	4.1
Family dynamics	4	2.7
Business skills and/or business planning	4	2.7
Credit access	4	2.7
Farm debt	4	2.7
Discrimination based on gender/gender expression	4	2.7
Pests or disease management	4	2.7
Competition	3	2.0
Appropriate technology	3	2.0
Water	3	2.0
Product prices	3	2.0
Childcare	2	1.4
Anticipated discrimination	2	1.4
Training opportunities and/or lack of skill	2	1.4
Taxes	2	1.4
Slaughterhouse and/or processing access	2	1.4
Discrimination based on race, ethnicity, or country of origin	1	0.7
Health of a family member	1	0.7
Discrimination based on sexuality	1	0.7
Regulatory burden	1	0.7
Market access	0	0

Note: Respondents could choose only one response.

Figure 1. Challenges Reported by Queer Farmers



skills or business planning, many of the farmers in this sample gained such skills by attending higher education institutions, such as land-grant universities or technical colleges, and/or through apprenticeships or on-farm training opportunities. Further, farmers may gain additional business skills by joining farmers' networks or attending conferences that discuss these skills and share resources. However, these opportunities for knowledge sharing are shaped by cissexism and heterosexism. For example, Wypler (2019) demonstrated that even among women's agriculture conferences, lesbian farmers felt excluded and disconnected. Many of these agricultural conferences refuse to acknowledge the presence of queer farmers in their organization or fail to provide resources such as all-gender bathrooms at their events, implicitly excluding transgender and nonbinary farmers. Agricultural apprenticeships with cisgender heterosexual farmers can be uncomfortable and even dangerous for beginning queer farmers (Leslie, 2019).

In the case of health insurance, married heterosexual farming households often rely on off-farm employment (Leslie et al., 2019). For queer farm-

ers, farming with a married partner to access insurance is likely less common due to marriage norms. For example, even though same-sex marriage has been federally legal since 2015, heterosexism still creates barriers in society for queer people to be in these types of relationships. Further, queer farmers may reject the idea of marriage and monogamy (Leslie, 2019); for some queer people, marriage is associated with "homonormativity" (Duggan, 2002) or the idea that queer people are attempting to replicate heterosexual norms. Health insurance remains a core issue for many farmers regardless of sexuality, gender, or race. Queer people face additional hurdles in this area due to the linkage of insurance to marriage and the paucity of queer-specific health care in rural areas (Jerke, 2011; Rosenkrantz et al., 2017).

In many cases, queer farmers are attempting to farm in rural areas or work on farms located rurally, where lack of affordable housing remains a common issue for all people (Movement Advancement Project, 2019). However, housing remains an issue shaped by heteropatriarchy. For example, many local zoning regulations stipulate that

accessory dwelling units may only be occupied by people related to the main house by blood or marriage. Regulations that use biological and state-sanction kinship to determine the legality of unrelated people on land mean that queer people are prohibited from living in certain places. Further, issues of safety and farm viability also come to bear in the case of land access. These results illustrate that farmers expect discrimination. As such, queer farmers must consider how safety and acceptance in the community where they live and/or work will impact their livelihood as farmers.

Federal and state governments, nongovernmental organizations, and agricultural sciences pour vast resources into topics such as pests and disease, market access, and land access, as these remain crucial topics for farmers. However, these results highlight that queer farmers report isolation and anticipated discrimination as substantial barriers to farming success. These findings suggest an increased need for governmental and nonprofit organizations to invest in addressing these social barriers to ensure that queer farmers are better positioned to address economic and environmental barriers. Further, 63.3% of respondents reported anticipated discrimination as somewhat of a challenge or a significant challenge, detailing a core deterrent for entering and remaining in the profession, especially rurally, where farming typically occurs.

The low reporting of personal health/age and racial discrimination as crucial barriers likely illustrates that our sample was younger, thus experiencing fewer health/age issues, and predominately white, thus not experiencing racism. The higher reporting of gender discrimination and farm debt likely signals a larger representation of women farmers and younger farmers.

The survey also inquired in detail about three core issues for farmers, including credit access, land access, and market access. Table 4 details the specific ways in which queer farmers experience barriers in these areas.

As highlighted in the literature, queer populations struggle to obtain credit (Badgett et al., 2019; McFadden, 2020; Watson et al., 2021). The issue of credit is mirrored for queer farmers who are unable to access credit due to a lack of credit history or

low credit score. The smaller number reporting that the loan officer did not understand the business model ($n=8$) may indicate how some queer farmers attempt to build models not based on family farms, but these may be illegible to loan officers. Like many young farmers (Ackoff et al., 2017), land affordability remains a core deterrent to farming. However, queer farmers also reported struggling to find land in locations that allowed them to feel safe or supported as a queer person and encountered barriers in finding land with housing. We have demonstrated these issues are inherently intertwined with heterosexism. Higher reporting of market-based issues such as saturated markets or distance from markets may indicate how queer farmers may be systematically excluded from regions with more market opportunities or from farms more ideally positioned near markets. However, lower reporting of heterosexism and cissexism in the marketplace may indicate how queer farmers are self-selecting places where they receive support for being queer-owned, as some visible queer farm owners report positive experiences despite expecting discrimination (Hoffelmeyer, 2021).

What Helps Queer Farmers Be Successful?

The survey also asked farmers to report on the resources that helped them be successful. Table 5 shows how queer farmers ranked the significance of resources in contributing to their success. LGBTQIA+ farm mentors or peers substantially contributed to farmers' success, as 18% of respondents noted that this was the most significant contribution to their success, over three times the number who reported Cooperative Extension (5%) as being beneficial to their success. The lower reporting of assistance gained from LGBTQIA+ farmer programs, events, or networks may indicate a lack of these programs, even though such offerings would likely provide additional opportunities to connect with queer farm mentors and peers. These findings suggest the crucial role that other queer people in agriculture play in the success of queer farmers, as reflected by qualitative studies (Hoffelmeyer, 2021; Wypler, 2019). Further, these data highlight how queer farmers may be excluded from traditional support

Table 4. Credit, Land, and Market Issues

If you find credit access to be a challenge, what specifically seems to be a problem?	Frequency
Lack of credit history or a low credit score	26
Denied credit by a bank because the loan officer did not understand my practices or business model	8
Qualified for a loan, but it was too little money	5
Denied credit by USDA because I don't have the required farming experience	1
Denied credit by USDA because the FSA agent did not understand my practices or business model	1
Denied credit by USDA because I was told by USDA that there were no loan funds available right now	1
Denied credit by a loan agent because the agent did not take me seriously because of my gender, gender expression, or sexuality	1
Other	4
If you find land access to be a challenge, what specifically seems to be a problem?	
Cannot find affordable farmland for sale	49
Land costs more to purchase than the value of what I can produce	41
Cannot find affordable farmland for rent	26
Land costs more to rent than the value of what I can produce	26
Cannot find land where I feel supported in my LGBTQIA+ identity	25
Cannot find land with housing or in an area close to where housing is available	24
Cannot find land with the appropriate resources for my business	22
Current land access is insecure, and I worry that I will lose access to the land	21
I do not know how to look for land	20
When I try to purchase land, I am outbid by non-farmers	7
When I try to purchase land, I am outbid by other farmers	4
Other	5
If you find market access to be a challenge, what specifically seems to be a problem?	
Prices are too low	32
There are too many farmers in my area producing the same product(s)	28
Located too far from a viable market	19
Cannot access a market where my LGBTQIA+ identity is supported	8
Do not have correct certifications (like GAP*) to access the markets I want	6
Other	11

*Good Agricultural Practices ("a voluntary certification program which verifies ... that fruits and vegetables are produced, packed, handled, and stored in the safest manner possible to minimize risks of microbial food safety hazards" [New York State Department of Agriculture and Markets, n.d., para. 1]).

networks aimed at helping farmers be successful.

As shown in Table 5, the Affordable Care Act also provided substantial support to these farmers. When respondents were asked about their ability/disability status, they reported sensory impairment ($n=16$), learning disability ($n=24$), neurological disease/disorder ($n=1$), long-term medical illness ($n=11$), mobility impairment ($n=7$), mental health disorder ($n=62$), and temporary impairment ($n=10$). Like the Young Farmers survey, which found health insurance was a top barrier, this survey sug-

gests that access to healthcare helps queer farmers maintain farm viability and farmer well-being.

Apprenticeship and community supported agriculture were also reported among the most beneficial resources for farmers' success. These areas reflect the importance of knowledge, social networks, and credit (community supported agriculture includes a loan component to the farmer) to queer farmers' experiences, which has been supported by qualitative studies (Leslie, 2019; Wypler, 2019).

Conclusion

This study found both interpersonal and systemic oppression among a relatively privileged segment of the queer farmer population, suggesting that heteropatriarchal oppression in agriculture is likely much more pernicious and widespread than these survey findings suggest. While interpersonal discrimination can be evident on the surface, tools such as surveys helpfully detect systemic patterns of difference across social groups. In this survey, we found that the top four barriers that queer farmers faced related to their queerness—or rather, to heteropatriarchy—included anticipated discrimination, social isolation, training opportunities and/or lack of skill, and family dynamics. These are areas of interpersonal interaction that affect farmers' well-being and farm viability and, in farmers' eyes, are clearly associated with gender and sexual oppression. Additionally, respondents reported LGBTQIA+ farm mentors or peers as the most helpful resource for their success; together, these findings on challenges and supports point to the need to encourage and fund queer-to-queer farming networks and initiatives like the Queer Farmer Network and Northeast Queer Farmer Alliance. Such a high reporting of the importance of LGBTQIA+ farm mentors or peers emphasizes the salience of heteropatriarchal interpersonal interactions in queer farmers' daily lives. Further, the reported minimal help from Cooperative Extension and training programs in comparison to higher levels of help from LGBTQIA+ farm mentors or peers indicates a need for existing farmer programs to critically assess the heteropatriarchal culture of those spaces and to prioritize hiring more queer staff.

In addition to queer farm mentors or peers, this survey found that the Affordable Care Act, apprenticeships, and community supported agriculture were crucial for queer farmers' success. These respondents' top areas of support align with the

Table 5. What Helps Queer Farms Be Successful

	Frequency (n)	Percentage
LGBTQIA+ farm mentors or peers	24	18%
Affordable Care Act (health insurance exchanges)	19	14
Apprenticeships	17	13
Community supported agriculture (CSA)	14	11
Family and/or cultural knowledge	8	6
Student loan forgiveness	8	6
Farmers markets	8	6
Cooperative Extension	7	5
LGBTQIA+ farmer programs, events, or networks	4	3
State grants	4	3
USDA farm loan programs	4	3
Organic certification	3	2
Training programs	3	2
USDA conservation programs	3	2
Land linking programs	2	2
Land trusts	1	1
Local/regional food marketing	1	1
Marriage equality	1	1
Farm credit	1	1
Farm-to-school programs	1	1

Note: Respondents could select only one response.

top reported challenges of healthcare, knowledge, and credit, respectively, each of which is negatively affected by heteropatriarchy (Leslie, 2019). Queer farmers' reporting of high support from the ACA suggests that healthcare reform is a gender and sexual justice issue in addition to a top need for farmers in general, especially those who cannot access healthcare through their own or an intimate partner's off-farm work.

The top four areas queer farmers reported as challenges to farming success were profitability, land access, health insurance, and affordable and/or available housing. While these challenges differ from those that queer farmers attributed to their queerness, we argue that existing literature demonstrates how these top challenges are strongly affected by heteropatriarchy (Behere & Bhise, 2009; Cramer, 2020; Hoffmeyer, 2021; Leslie, 2017, 2019; Leslie et al., 2019; Rosenkrantz et al., 2017; Wypler & Hoffmeyer, 2020). These challenges reflect areas of systemic discrimination that

contribute to overall low profitability for queer farmers. This finding points to the importance of funding queer land, housing, and health access programs, especially in rural areas. The importance of healthcare coupled with the high reported rates of social isolation suggests the need for bolstering queer farmer mental health programs (Wypler & Hoffelmeyer, 2020).

The results from this survey also suggest the need for including LGBTQ+ people in the USDA's socially disadvantaged farmer category to make this extra class of resources available to queer farmers. The documentation of women in agriculture helped facilitate the understanding that sexism influences agricultural production. In the same manner, beginning to document queer farmers' involvement in farming suggests these farmers, too, require tailored support through the socially disadvantaged farmer category.

A glaring limitation of this study was its sample of predominantly white women farm owners. These results should not be interpreted as generalizable to all queer farmers. Rather, more research is needed to understand the challenges and successes of other members of the queer farming community, especially queer farmers of color, queer farmworkers, and transgender farmers.

This study implies the need to reform farmer surveys. Concretely, we must add gender identity and sexual orientation questions to the USDA Census of Agriculture and other surveys to learn about the prevalence of gender and sexual discrimination in agriculture. We need more diverse samples to distinguish differences that likely exist between

queer farmers based on race, ethnicity, nation, geography, gender, sexuality, and class. This study calls on government, advocates, and researchers to ask and oversample LGBTQIA+ farmers in order to reverse the continued erasure of queer farmers in agriculture. Fears that adding these questions will lower overall response rates must be put into context: is the goal to maintain a narrow definition of farmer or to broaden our horizons by designing surveys to fully capture agricultural communities, thereby contributing to an overall more resilient and equitable agrifood system?

We hope this early survey of queer farmers encourages researchers and practitioners to consider gender and sexuality more deeply as dimensions of social power, indicators of equity in agriculture, and central questions of the food justice movement and scholarship. Asking these difficult questions—on surveys and beyond—is central to food justice as well as to the project of advancing farmer well-being and farm viability.

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References

- Ackoff, S., Bahrenburg, A., & Schute, L. L. (2017). *Building a future with farmers II: Results and recommendations from the National Young Farmer Survey*. National Young Farmers Coalition.
<https://www.youngfarmers.org/resource/building-a-future-with-farmers-ii/>
- Badgett, M. V. L., Choi, S. K., & Wilson, B. D. M. (2019). *LGBT poverty in the United States: A study of differences between sexual orientation and gender identity groups*. UCLA School of Law Williams Institute.
<https://escholarship.org/uc/item/37b617z8>
- Behere, P. B., & Bhise, M. C. (2009). Farmers' suicide: Across culture. *Indian Journal of Psychiatry*, 51(4), 242–243.
<https://doi.org/10.4103/0019-5545.58286>
- Bell, M. M., Ashwood, L. L., Leslie, I. S., & Schlachter, L. H. (2020). *An invitation to environmental sociology* (6th ed.). SAGE Publications. <https://us.sagepub.com/en-us/nam/an-invitation-to-environmental-sociology/book255384>
- Cramer, S. E. (2020). Gaining ground: An exploration into the lives of Missouri's Lesbian farmers. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 163–178. <https://doi.org/10.5304/jafscd.2020.093.017>

- DeFilippis, J. N. (2016). "What about the rest of us?" An overview of LGBT poverty issues and a call to action. *Journal of Progressive Human Services*, 27(3), 143–174. <https://doi.org/10.1080/10428232.2016.1198673>
- Dentzman, K., Pilgeram, R., Lewin, P., & Conley, K. (2021). Queer farmers in the 2017 U.S. Census of Agriculture. *Society & Natural Resources*, 34(2), 227–247. <https://doi.org/10.1080/08941920.2020.1806421>
- Duggan, L. (2002). The new homonormativity: The sexual politics of neoliberalism. In R. Castronovo & D. D. Nelson (Eds.), *Materializing democracy: Toward a revitalized cultural politics* (pp. 175–195). Duke University Press. <https://doi.org/10.1215/9780822383901-007>
- Hailey, J., Burton, W., & Arscott, J. (2020). We are family: Chosen and created families as a protective factor against racialized trauma and anti-LGBTQ oppression among African American sexual and gender minority youth. *Journal of GLBT Family Studies*, 16(2), 176–191. <https://doi.org/10.1080/1550428X.2020.1724133>
- Hawley, J. [@HawleyMO]. (2022, February 17). MO farmer sent me Biden Admin's latest farm producer survey. It asks such important questions for farming as whether farmers [Image attached] [Tweet]. Twitter. <https://twitter.com/HawleyMO/status/1494346958592520192>
- Hoffelmeyer, M. (2021). "Out" on the farm: Queer farmers maneuvering heterosexism & visibility. *Rural Sociology*, 86(4), 752–776. <https://doi.org/10.1111/ruso.12378>
- Jerke, B. W. (2011). Queer ruralism. *Harvard Journal of Law and Gender*, 34(1), 259–312. <https://harvardjlg.com/>
- Keller, J. C. (2015). Rural queer theory. In B. Pini, B. Brandth, & J. Little (Eds.), *Feminisms and ruralities* (pp. 141–151). Lexington Books.
- Leslie, I. S. (2017). Queer farmers: Sexuality and the transition to sustainable agriculture. *Rural Sociology*, 82(4), 747–771. <https://doi.org/10.1111/ruso.12153>
- Leslie, I. S. (2019). Queer farmland: Land access strategies for small-scale agriculture. *Society & Natural Resources*, 32(8), 928–946. <https://doi.org/10.1080/08941920.2018.1561964>
- Leslie, I. S., & White, M. M. (2018). Race and food: Agricultural resistance in U.S. history. In P. Batur & J. R. Feagin (Eds.), *Handbook of the sociology of racial and ethnic relations* (pp. 347–364). Springer. https://doi.org/10.1007/978-3-319-76757-4_19
- Leslie, I. S., Wypler, J., & Bell, M. M. (2019). Relational agriculture: Gender, sexuality, and sustainability in U.S. farming. *Society & Natural Resources*, 32(8), 853–874. <https://doi.org/10.1080/08941920.2019.1610626>
- McFadden, C. (2020). Discrimination against transgender employees and jobseekers. In K. F. Zimmermann (Ed.), *Handbook of labor, human resources and population economics* (pp. 1–14). Springer International Publishing. https://doi.org/10.1007/978-3-319-57365-6_35-1
- Movement Advancement Project. (2019). *Where we call home: LGBT people in rural America*. <https://www.lgbtmap.org/policy-and-issue-analysis/rural-lgbt>
- New York State Department of Agriculture and Markets. (n.d.). *Good Agricultural Practices*. Retrieved April 26, 2023, from <https://agriculture.ny.gov/food-safety/good-agricultural-practices>
- Newcomb, M. E., Lasala, M. C., Bouris, A., Mustanski, B., Prado, G., Schrager, S. M., & Huebner, D. M. (2019). The influence of families on LGBTQ youth health: A call to action for innovation in research and intervention development. *LGBT Health*, 6(4), 139–145. <https://doi.org/10.1089/lgbt.2018.0157>
- Patterson, G. (2019). Queering and transing quantitative research. In W. P. Banks, M. B. Cox, & C. Dadas (Eds.), *Re/orienting writing studies: Queer methods, queer projects* (pp. 54–74). Utah State University. <https://doi.org/10.7330/9781607328186.c004>
- Pilgeram, R., & Amos, B. (2015). Beyond "inherit it or marry it": Exploring how women engaged in sustainable agriculture access farmland. *Rural Sociology*, 80(1), 16–38. <https://doi.org/10.1111/ruso.12054>
- Pilgeram, R., Dentzman, K., Lewin, P., & Conley, K. (2020). How the USDA changed the way women farmers are counted in the Census of Agriculture. *Choices*, 35(1), 1–10. <https://www.jstor.org/stable/27098549>
- Rosenkrantz, D. E., Black, W. W., Abreu, R. L., Aleshire, M. E., & Fallin-Bennett, K. (2017). Health and health care of rural sexual and gender minorities: A systematic review. *Stigma and Health*, 2(3), 229–243. <https://doi.org/10.1037/sah0000055>

- Sachs, C. E., Barbercheck, M. E., Brasier, K. J., Kiernan, N. E., & Terman, A. R. (2016). *The rise of women farmers and sustainable agriculture*. University of Iowa Press. <https://doi.org/10.2307/j.ctt20p57gr>
- Smith, B. J., II (2019). Food justice, intersectional agriculture, and the triple food movement. *Agriculture and Human Values*, 36(4), 825–835. <https://doi.org/10.1007/s10460-019-09945-y>
- Watson, S., McNeil, O., & Broisman, B. (2021). *The economic well-being of LGBT adults in the U.S. in 2019*. Center for LGBTQ Economic Advancement and Research. <https://lgbtq-economics.org/research/lgbt-adults-2019/>
- Weston, K. (1997). *Families we choose: Lesbians, gays, kinship* (2nd ed.). Columbia University Press.
- Wypler, J. (2019). Lesbian and queer sustainable farmer networks in the Midwest. *Society & Natural Resources*, 32(8), 947–964. <https://doi.org/10.1080/08941920.2019.1584834>
- Wypler, J., & Hoffelmeyer, M. (2020). LGBTQ+ farmer health in COVID-19. *Journal of Agromedicine*, 25(4), 370–373. <https://doi.org/10.1080/1059924X.2020.1814923>
- Young, L. J., & Rater, B. R. (2022). *The Farm Producer Survey: Unit and item nonresponse*. U.S. Department of Agriculture National Agricultural Statistics Service. <https://doi.org/10.22004/ag.econ.327249>

Experiences of structural violence and wage theft among immigrant workers in the California cannabis industry

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Abstract

The multibillion-dollar California cannabis (*Cannabis sativa*, marijuana) industry employs an unknown number of seasonal workers, including

many immigrants. Most production occurs in the remote, rural, far-northern counties where farms may be hours by vehicle from the nearest town. While licenses for cannabis cultivation became available following legalization in California for adult recreational use in 2016, most cannabis—about 80%—is still grown on unlicensed farms. Cannabis is a labor-intensive crop, and the skilled

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and time-consuming task of hand-trimming flowers is the most common seasonal job in the industry. Some immigrant workers return for multiple cannabis harvest seasons and are attracted to the work by an interest in the cannabis culture and consumption or the opportunity to earn enough money in several months to live the rest of the year in their home country. Others are farmworkers moving from work in traditional crops for the relatively higher pay in the cannabis industry. Seasonal cannabis workers are exposed to many of the physical hazards found in all agricultural workplaces, like dust, pesticides, and injuries; another commonality with California's traditional agricultural workforce is vulnerability to structural violence stemming from factors related to race, gender, immigration status, and employer/employee power imbalance. Cannabis workers are also uniquely affected by the intersections of these structural factors with the isolated and remote nature of cannabis farms and the ongoing criminalization of the industry. In this article we present the results of a qualitative study of the occupational health and safety of Mexican and South American immigrant seasonal cannabis workers who have previous cannabis-industry-specific skills and experience. Workers were recruited using a peer-recruitment method, with 25 participants in three online focus group discussions on a range of occupational health and safety topics. This qualitative descriptive analysis is focused on experiences of structural violence and wage theft.

Keywords

Cannabis Industry, Farmworker Health, Structural Violence, Occupational Health, Immigrant Health, Farm Labor

Introduction

Cannabis is the most valuable agricultural product in California, with combined legal and unlicensed revenues estimated at US\$8.7 billion in 2019 (Sumner et al., 2020). It is also the only commercial crop that is criminalized; while medical cannabis is legal in 38 states and recreational adult use legal in 21 (National Conference of State Legislatures, 2023), cannabis cultivation and use is illegal at the federal level and most California farms remain unli-

censed. The rural, far-north counties in California, including the “Emerald Triangle” of Humboldt, Trinity, and Mendocino counties, produce the largest share of total cannabis, where about 90% is grown outdoors or in greenhouses (Sumner et al., 2020). Cannabis cultivation lends itself to land that is too rugged or isolated for other crops, and many unlicensed farms (“grows”) are dispersed in the mountains (Dillis et al., 2021). No formal records are kept of employment in the cannabis industry, so the number of workers is difficult to estimate; conservative econometric models provide an estimate of 58,000 full time-equivalent jobs in the California legal industry in 2021 (Barcott et al., 2021). However, only about 20% of cannabis produced in state is sold legally (Sumner et al., 2020), and so the scale of total employment is unknown. There are also no data on the demographic characteristics of the cannabis workforce.

Cannabis cultivation and processing are labor-intensive, with the most detailed and time-consuming task being hand-trimming, where workers use small scissors to trim leaves and stems away from cannabis flowers. During the outdoor harvest season in Northern California, seasonal trimmers (sometimes referred to as *trimmigrants*) congregate in search of jobs where they will be paid by the pound of finished product, often working 10–12 hour shifts at isolated grow sites (Beckman, Castañeda et al., 2022). Due to the illegal status of cannabis at the federal level, there are no legal routes for U.S. visa holders to work in the cannabis industry. Following the 2016 legalization of adult recreational use in California, cannabis-specific labor staffing agencies have been established that place trimmers and other seasonal workers on licensed farms; however, the many unlicensed operations do not have access to hiring via staffing agencies, nor are undocumented workers able to seek employment through an agency or legal hire. Most seasonal trimmers seek work either through existing peer-to-peer contacts or by meeting growers in the larger towns in cannabis-growing regions.

In the past, trimmigrants were drawn to the industry not only by relatively high pay for seasonal work but due to an interest in consuming cannabis, being part of the cannabis culture, or seeking a long-term career in the industry. These workers

were characterized as largely U.S. citizens or European immigrants; while some of these seasonal workers still arrive, recreational legalization has resulted in the number and size of cannabis farms growing and decreasing piece-rate pay as the market is flooded with lower-price cannabis (Wilson, 2022). In California, farmers need to hire more workers who are willing to accept lower pay, and the worker population has shifted to experienced white and Latino immigrants from Latin America who return yearly for the cannabis season, and most recently to Latino farm workers transitioning from other crops and to Asian immigrants (Hamilton, 2018; Velie, 2018).

A major driver of health disparities in farm-worker communities is structural violence—the totality of social systems and arrangements that cause harm to individuals and populations, including constructions of race, gender, and immigration status (Sbicca et al., 2020). Structural violence is further described this way by medical anthropologist Paul Farmer and colleagues (2006): “The arrangements are *structural* because they are embedded in the political and economic organization of our social world; they are *violent* because they cause injury to people (typically, not those responsible for perpetuating such inequalities)” (“Defining Structural Violence,” para. 1). To varying degrees, these post-legalization immigrant workers are vulnerable to the same set of hazards that affect most immigrant and migrant agricultural workers. Despite being undocumented, returning skilled immigrants are often English-speaking, have existing contacts in the industry, and are more likely to be able to navigate the industry landscape safely (Raskin, 2016). Workers transitioning from other crops are more likely to share the characteristics of other California agricultural workers, who are predominantly Hispanic/Latino (96%), have lower English fluency (84% speaking little or no English), and are likely (51%) to be undocumented (Ornelas et al., 2022). Labor trafficking does occur in the industry and has been discovered at both licensed (Velie, 2018) and illicit (Fertig & Mueller, 2022; Hernandez, 2021) grows—in those reports, trafficked workers were Latino and Hmong immigrants.

This article is one part of a series of analyses

from a qualitative study using focus group discussions (FGDs) and key informant interviews (KIIs) of the experiences and knowledge of people who work or have worked in the cannabis industry. To our knowledge, this is the first cannabis worker health study that recruited immigrant seasonal trimmers. The purpose of this study was to gather information on cannabis workplace hazards that is critically needed to inform future research as well as regulatory and outreach actions, while using an approach that allows workers to steer conversations to the concerns and needs they feel are most important. Three domains emerged during the analysis, resulting in a previously published analysis of physiological hazards and their health effects (Beckman, Castañeda et al., 2022), a forthcoming analysis of job stress and mental health, and the present qualitative descriptive discussion of structural violence and experiences of wage theft endured by participants who were immigrant seasonal workers.

Applied Research Methods

The study methods have previously been described in detail (Beckman, Castañeda et al., 2022). We used a peer-recruiting approach, with three seasonal immigrant trimmers known to the research team via previous work agreeing to recruit participants among their friends and industry contacts, resulting in four FGDs of 32 workers total and nine KIIs. The FGD/KII facilitator (XC) prompted open-ended discussions of worker health and safety topics using semi-structured guides. Sessions were held online (via Zoom) in English with informal Spanish interpretation available by the facilitator, a native Spanish speaker. The guides did not solicit information on immigration or documentation status or participation in illegal activities, and the KIIs and FGDs were not video- or audio-recorded. Two trained study staff members transcribed the sessions, omitting any identifying information such as person, business, or specific location names. They then combined notes to ensure that no responses were missed. The study protocol was determined to be exempt from review by University of California, Davis, and University of California, Berkeley, institutional review boards (IRBs) under 45 CFR 46 Subpart A §46.104

Exempt research, Category 2 (i) “The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects” (U.S. National Archives and Records Administration: Office of the Federal Register, 2021). Participants provided verbal informed consent at the beginning of each session and were free to decline to respond to any topics or leave the discussion at any time.

This analysis focuses on the 25 immigrant FGD participants from Mexico and South America who had experience primarily as seasonal cannabis workers. Six FGD participants who had held primarily year-round jobs and one seasonal trimmer who was a U.S. citizen were excluded. Using deductive thematic analysis (Braun & Clarke, 2006), we grouped responses by semi-structured guide topic; for responses falling outside the semi-structured guide, topics were grouped inductively. We identified subthemes based on applicable social structures and analyzed these experiences in the context of the structural conditions that enable them: immigration status, race and/or ethnicity, gender, workplace relational hierarchies, and the criminalized nature of the cannabis industry. These issues are deep and complex, with many intersections, and for interpretation we sought to organize the social conditions as discretely as possible and contextualize each with relevant literature. The experience of wage theft was prominent and universal—a common thread influenced by all the social factors.

Since the slang term *trimmigrants* is sometimes used to refer to all seasonal workers who travel to Northern California for cannabis work, and not just immigrants, we will refer to these workers as “immigrant trimmers.” While some of the experiences of withheld or shorted pay could be considered labor trafficking, we use the term “wage theft” out of deference to the participants choice not to describe their experiences as trafficking.

Results and Discussion

Demographics

Most participants self-identified as Latino/a/x (17, 68%) with 5 (20%) identifying as white, and most

gave their country of origin as Mexico (21, 84%). The median age was 34 years (interquartile range [IQR]: 29, 35), and 56% were women. College education was common—21 (84%) reported at least some college education. All had worked as trimmers, with six reporting additional experience with outdoor cultivation work. Focus groups were held in English, but 80% of participants spoke only Spanish at home. The median duration of employment in the cannabis industry was seven months (IQR: 3, 18) which is equivalent to about three harvest seasons.

Immigration and Documentation

All the participants entered the U.S. using a tourist visa (U.S. visa category B-2), which prohibits any employment or paid work, and went on to work as undocumented immigrants. All reported working in the cannabis industry primarily for the money, but none reported working to send money home for family. Several specified that they worked as a trimmer because the wages in U.S. dollars of one harvest season supported them in their home country for the rest of the year. While the participants and many workers like them travel to the U.S. voluntarily using a visa, some year after year, there are documented cases of cannabis workers who are transported across the U.S. border without documents, associated with operations involving organized crime (St. John, 2022). None of the participants reported being trafficked or working with trafficked persons.

The stress described by participants began before crossing the border. They had strategies including choosing airports where they thought they would have a better chance of avoiding interrogation and deleting applications and data on their phone to eliminate any information that could indicate they intended to work in the U.S. Several participants had experienced detentions:

It is a physical, emotional, and psychological preparation to come to the U.S. I need to have all the answers prepared, I have to make sure to have Instagram, WhatsApp, Telegram, and all the data on my phone erased before crossing the border.

Last year I traveled with my boyfriend and he is an almost-white man, and they did not arrest him. They kept me for several hours in the detention room. I am brunette and with Indigenous features, I am from Mexico.

Like other undocumented immigrants, participants had a fear of deportation, which causes negative psychological and physical health effects (Hacker et al., 2015). The potential for immigration status disclosure and deportation causes stress, and, in addition, reduces health care utilization and decreases the chance that the victim of any crime (e.g., wage theft) will make a formal report. Participants repeatedly stated that their undocumented status prevented any recourse for wage theft. Regardless of documentation status, immigration policy is a key determinant of Latino health disparities in the U.S. by affecting access to healthcare and improved working conditions and wages (Philbin et al., 2018).

The most common response when participants were asked “What do you fear the most when working in this industry?” was that they would not be paid. Some cannabis growers leveraged the immigration status of trimmers by direct threats to report undocumented workers as well as by the implicit threat of detention if a worker tried to report mistreatment or wage theft:

They treat you [immigrants] differently. It’s instantaneous. I had a terrible experience where the first year they didn’t pay my friends and they paid others [U.S. residents]. And then they say, “well what are you going to do, you’re an illegal immigrant.”

The friction between escalating immigration policy enforcement and a continual need in the U.S. for low-wage labor results in an environment where wage theft (including non- and underpayment and failure to pay overtime) as well as workplace abuse are commonly experienced by undocumented workers in almost every industry (Fussell, 2011). Undocumented workers have the same legal rights to a safe workplace and workers’ compensation as all workers, but these rights are *de facto* inaccessible due to fears of retaliation by employers or

job loss as well as exposure to law enforcement. Consistent with producers of other agricultural products, licensed cannabis producers benefit from hiring undocumented workers who accept lower pay and allow them to avoid insurance and payroll taxes. One participant expressed the opinion that hiring undocumented and “under the table” seasonal workers is the only way licensed cannabis growers can remain profitable.

Race

All the participants had experienced racism in the workplace; because Latin American immigrants are racialized in the U.S. (Misra et al., 2021), even those identifying as white were discriminated against on this basis. The employers described by participants were white men, who they said treated European immigrant and white U.S. citizen workers better regardless of job type.

It’s really difficult, people who own the farm, or are the supervisors, are mostly white. You can see how they treat you; the racism is obvious, and we are treated differently, they pay you less.

Almost all the owners are Americans, and white. They can do whatever they want. It’s scary that everyone knows they have guns, do drugs, not in their five senses [behaving unpredictably], and most of the time they are racist, so you really live very concerned.

Participants described the demographic shift from U.S. citizens and European immigrants before 2016, to predominantly experienced white and Latino seasonal trimmers from Latin America, then to Latino immigrants moving to cannabis from less valuable crops, and most recently including self-organized crews of Hmong immigrants:

A lot of change. ... You hear a lot of the lower-class immigrants from Mexico, El Salvador, Guatemala, and Honduras working in the cannabis industry. Before it was this medium class that was traveling and trying to figure out their lives, but now it’s more for the low class.

The Hmongs and people from Laos are groups of 10-15 people. They have one manager who talks with the owners, and they have a deal for the payment. They promise to the owners that they will do a certain number of pounds a day. They do things in teams; they have a good relationship between them.

Participants also described being a captive audience to racist comments and slurs from white owners and being unable to respond due to their low status in the workplace. Some had bosses who exceptionalized one perceived race of workers to criticize another, such as claiming that Latinos are hard workers but Asians are untrustworthy. Previously, demographic descriptions of seasonal trimmers have been largely confined to news articles that often describe trimmers similar to this study's participants—young Latin American immigrants who choose to travel for cannabis work out of an interest in the culture as well as the potential for high pay (Hamilton, 2018; Raskin, 2016). In contrast, the workers described above as “low class” are likely to be among the traditional farm labor workforce of undocumented immigrants from Mexico and Central America hoping to escape extreme poverty and violence in their country of origin (Holmes, 2013).

Structural racism—the entirety of complex and intersecting systems reinforcing racial discrimination (Reskin, 2012)—is a major driver of health disparities in the U.S. (Phelan & Link, 2015). A component of this overarching system is occupational health inequity. People of color, in particular Black and Latino workers, are more likely to hold lower-paying and precarious jobs and those described as “dirty, dangerous, and demanding (sometimes degrading or demeaning)” (Moyce & Schenker, 2018, p. 352) and have higher risk of workplace injury and illness (Murray, 2003). Study participants described frequent injuries and hazardous exposures in addition to the experiences of structural discrimination (Beckman, Castañeda et al., 2022). Workers who experience or witness acts of racism in the workplace experience psychological distress, depression, and emotional trauma as well as somatic effects like worse self-rated health and body pain (Okechukwu et al., 2013). In addi-

tion to the emotional aspects of distress and frightening situations, study participants ubiquitously reported chronic back and upper extremity pain, which was attributed to chronic stress as well as the physiological hazards of trimming (Beckman, Castañeda et al., 2022).

Gender Discrimination and Violence

Trimming is a marginalized job within the cannabis industry—it is an entry-level job despite requiring specific skills (Robinson, 2016) and is the job most held by women, sometimes called “trim bitches” and hired based on appearance in addition to skill (August, 2013). Participants described a common social hierarchy on farms where male owners who dated pretty women or had the prettiest trimmers were respected more.

I met a guy that has a farm, 60-70 years old. He wanted women on his farm. Trying to seduce you in some way to get you on the farm. ... This guy was very authoritarian, and I am a reactive person so I couldn't say anything because I knew it might go bad, but I was scared of not finding another job at the moment.

Several participants had heard of growers who paid women more to work topless, which is supported by the research of Karen August (2013) based on employment ads for trimmers. All the female study participants reported experiencing some form of sexual harassment or discrimination on the job, most often by supervisors. None reported experiencing sexual assault, but two women participants described sexual assault as the worst thing that could happen while doing cannabis work.

Workplace sexual violence and discrimination cause psychological and physical health effects that include chronic pain, trauma, and depression, which may persist for years after the precipitating event (Kim et al., 2016). Latina farm workers experience sexual violence at much higher rates than other women workers, with 80% of California Mexican women farm workers in one study reporting sexual harassment (Waugh, 2010). The experiences of workplace sexual objectification reported

by women participants of this study are associated with adverse health effects, while co-occurring life experiences of objectification, harassment, and fear of rape result in trauma and chronic physical as well as mental health outcomes (Chan et al., 2008; Miles-McLean et al., 2015). Like many farmworkers, seasonal cannabis workers live in temporary housing at their work site, which causes blurring of the lines between the workplace and personal lives and exposure to perpetrators of violence both on and off the job.

Workplace Injustice

The organizational structure for rural cannabis grows that participants described most often was a hierarchy with an owner, several long-term workers (who are often white U.S. citizens and friends or family members of the owner), and seasonal workers, including trimmers. Participants unanimously reported that farm owners and managers used their higher status in the workplace to threaten and intimidate workers:

There have been a couple of times that I have had a gun pointed to my head because the owners get paranoid, and they think you're stealing. If they don't pay you, it's not like you can get a bigger gun and come back.

There is coercion from the boss—they walk around with a gun in order to scare us and make sure people are working and don't steal. They want to maintain an atmosphere where everything is under their control even if it's not a direct attack.

The unifying experience in this analysis, wage theft, was enforced by intimidation and threats. Many participants had experienced instances when the owners paid less than the agreed-upon piece rate or even withheld pay entirely because the selling price of cannabis was lower than expected:

You are a migrant on top of a hill in the middle of nowhere and you don't even know if they are going to pay you. Some places pay every week or two weeks or when owners sell a bunch of weed. The payment went from

[US]\$150 to [US]\$125 [per pound] this year. They had told us this the last day of working. You can't tell them anything because they have guns, they have cameras.

You are on a status that doesn't allow you to ask for rights. You feel unsafe. In relation to payment, you are working without a contract or anything that secures that they are going to pay you. ... If the person gets mad and they don't want to, they don't pay you.

Based on the experiences of study participants, some cannabis growers may inflict a more extreme form of abuse than is described in other workplaces. Only two participants reported being threatened by a gun pointed at them, but all participants reported employers displaying guns as an implicit threat. Many participants described the culture of cannabis cultivation in Northern California as “Wild West” and characterized by chaos and violent competition for money and power.

Much of the literature on harassment and abuse in the workplace cites a business management framework of *organizational justice* (Elovainio et al., 2002); however, leveraging the relational power imbalance between employers and employees necessary to extract surplus value fits the definition of structural violence. Interpersonal injustice, in particular abuse by supervisors, is more common in workplaces with minority or low-wage workers (Lopez et al., 2009) and results in physical and mental health disparities that include post-traumatic stress disorder, depression, and cardiovascular disease (Okechukwu et al., 2013). Beyond the overt experiences of intimidation and harassment, participants reported feeling disposable and dehumanized. The temporary residence of trimmers at remote, isolated workplaces with substandard and unsanitary housing (Beckman, Castañeda et al., 2022) parallels the experiences of other migrant farm workers (Moyce & Schenker, 2018). While there are differences between the cannabis industry and conventional agriculture as well as demographic differences between study participants and other farmworkers, the workplace maintains what Peter Benson (2008) describes in a structural violence framework as “a context of ethical variability

in which farm labor seems undignified and deserving of squalid conditions and inadequate social response” (p. 619). The working conditions of seasonal cannabis workers are no secret within cannabis farming communities, but only very recently has their suffering been brought to a more general audience or included in policy efforts (St. John & Elmahrek, 2023).

Criminalization of Cannabis

In addition to the immigration and border policing described previously, immigrant cannabis workers are directly affected by enforcement of the complex and contradictory federal, state, and local laws governing cannabis cultivation. In a historical current rippling to the present troubles of immigrant cannabis workers, the criminalization of cannabis in the U.S. began as a contrived racist backlash to Mexican immigrants in the early 20th century (Campos, 2018). The second most common response when participants were asked what they feared most about their job (after wage theft) was interactions with the police. None of them had experienced a raid or been detained, but all reported the risk and most always kept their personal documents and money on their person in case they needed to run from a raid.

The worst [fear] is not getting paid, but also having to see immigration police, get deported. That is the worst because you lose your money AND you can't come back to the States.

The concept of “legal violence” was developed by Menjivar and Abrego (2012) to describe the legal conditions that both inflict violence on undocumented immigrants and exclude them from the legal protections afforded to other groups. Both conditions are doubly inflicted on immigrant cannabis workers, who are undocumented and often working in a criminalized job. This increases the risk of wage theft; there is little recourse for most undocumented workers to obtain unpaid wages, but none for workers producing a criminalized crop. While participants occasionally reported that the working conditions were better on licensed farms, undocumented workers do not significantly benefit from state level legalization of cannabis.

Both licensed and illicit grows in California are raided by local police, the California Department of Fish and Wildlife (DFW), California Department of Cannabis Control (DCC), the federal Drug Enforcement Agency (U.S. DEA), and the Federal Bureau of Investigations (FBI). In 2021, the DEA made almost 4,000 arrests in California alone (U.S. Drug Enforcement Agency, n.d.); total numbers of enforcement actions performed by state and local agencies are not available, but the DCC reported assisting in 208 search warrants during July 2021–July 2022 (DCC, 2022). According to news reports and agency public relations, only farm owners and managers are arrested during raids, while lower-level workers such as trimmers are fingerprinted or photographed and released regardless of their documentation status (Parfitt, 2021/2022). Whether or not they result in detention, these enforcement actions terrorize undocumented workers. There is unequivocal evidence that exposure to police violence causes stress-related mental and physical health outcomes (DeVylder et al., 2022). While none of the study participants had experienced a law enforcement raid, indirect exposure to police violence and encounters with law enforcement, even in the absence of arrest or incarceration, have negative effects on mental and physical wellbeing (DeVylder et al., 2022; Sugie & Turney, 2017).

Due to the federally illegal status of cannabis, even licensed growers rarely have access to banking services, and so large amounts of cash and valuable cannabis products are present at all cannabis workplaces. One participant described a situation where a farmer instructed him to shoot potential robbers:

The guy said here's a shotgun, if someone comes, put the bullet in and shoot. It's just in case of emergency, and he keeps it in the woods so police don't see it. If someone comes, you are supposed to go find a gun in the woods and shoot with no training? Nothing happened, but anything could have happened.

Oregon community stakeholders in another recent qualitative study of the cannabis industry had suspicions of sex trafficking, but were also

concerned about the cash-based economy and crime occurring in communities due to cannabis farming (Smith et al., 2019). Participants in this study reported that trimmers are robbed in the population center of cannabis growing regions because people are aware that trimmers do not have access to banking and carry their season's pay in cash:

Some of the nearby cities know what's going on and what trimmers look like, so they'll jump [rob] them in the middle of the night in their hotel rooms.

When you go to the city people can tell who is a trimmer and who is not, and that is where the robbery happens. You become a target because they know you have cash.

Community Assets

The design of this study resulted in a deficit model (Morgan & Ziglio, 2007) focusing on identifying the vulnerability and problems in the population rather than the positive experiences of worker solidarity and joy. Participants also shared methods they used to cope with the dangers of their work in addition to experiences they enjoyed. The seasonal cannabis workforce is by nature dispersed; unlike many other crops, there are relatively few workers at each grow, and grows are isolated by geographic distance and irregular cell phone and internet access. Workers form communities, friend groups, and small informal teams and share information about bad employers when possible by creating groups using apps like WhatsApp or Telegram. Safety information is also passed by word of mouth—one participant with a longer tenure as a repeat seasonal worker shared that he always advised new women trimmers to work in pairs or teams for safety, and other workers described forming new cooperative relationships with other workers on their job site for transportation and mutual aid. Formal job training on tasks is minimal or absent, and more experienced workers sometimes took time away from their work to show new workers how to trim safely or be more productive.

When asked what they enjoy about their work or why they would return, all cited the money, but

many shared other positive experiences. One woman took pleasure in needing to be resourceful and creative to cook good food, and several workers enjoyed meeting new people and the sense of adventure. A common sentiment was enjoying the mountain scenery and clean air. Several participants did not consume cannabis, but others found success working in the industry to enjoy the “good weed” and learn more about cannabis cultivation.

Study Limitations and Strengths

The key limitation of this study was the sampling methodology, which prevents extrapolation of these results and experiences to the wider cannabis workforce. We used a peer recruitment model that resulted in a cluster of demographically similar workers, and due to the absence of data on cannabis worker demographics, it is not possible to assess how representative the sample is. However, this study is an important first step in describing the seasonal cannabis workforce in California and was a success in recruiting seasonal immigrant workers who would otherwise be difficult or impossible to reach via conventional methods. The FGDs were conducted in English to most accommodate international participants, which limited the groups to workers who felt comfortable communicating in English. In addition, the participants were relatively well-educated, and due to accessibility to peer recruiting, had at least some degree of social networking within the cannabis worker community. All the participants were tourist visa recipients; it can be difficult for Mexican citizens to obtain a tourist visa since they must prove in an interview with U.S. consular staff that they have enough financial resources and family ties in Mexico that they do not plan to overstay the visa or seek employment in the U.S.

This analysis draws comparisons between the participants and the existing body of research on undocumented, immigrant, and migrant farmworkers. It is important to note the sociodemographic differences between the participants and these workers while interpreting the results of this study. California row crop workers are mostly Hispanic/Latino (99%), more than half report not speaking any English, and 90% have less than 12 years of education (Ornelas et al., 2022), whereas the

participants in this pilot were all were English-speaking and most had at least some college education. However, immigrant cannabis workers are unstudied except for this work, and the most similar and reasonably well characterized demographic for comparison is California agricultural workers. There is little research overall on cannabis workers, and those who have participated in the existing published studies are most often white men who work for licensed cannabis businesses that are willing to allow researchers to interact with their employees on the job (Beckman, Langer et al., 2022; Sack et al., 2020; Walters et al., 2018). This creates a bias toward workers who have more stable jobs and relative social privilege over seasonal immigrant workers, and, in addition, includes only businesses that are confident enough about their employee satisfaction and health and safety plans to engage with researchers. This analysis begins to bridge the gap between these workers and the more marginalized and vulnerable groups of cannabis workers.

Due to the small size of the study, analytical limitations created by the choice not to record sessions, and large number of topics discussed during FGDs (as opposed to focused attention on a smaller range of subjects), we opted for a descriptive analysis focused on the words and narratives of participants. We acknowledge that a more scientifically rigorous approach would benefit future research.

Conclusions

As the cannabis industry works to overcome the legacy and stigma of criminalization, it is important to be clear that many cannabis businesses are invested in the dignity, health, and safety of their workers, including seasonal workers. Some growers have created groups to share information and resources on worker health and sought out voluntary training, and the United Food and Commercial Workers Union Western States Council has made inroads with legal industry workers seeking to organize their workplaces (Otañez & Grewal, 2021). While the problems are heightened by criminalization, isolation, and the “Wild West” culture of cannabis growing in Northern California, the experiences of structural and legal violence, dis-

crimination, and workplace abuse are also suffered by most agricultural workers in the U.S. However, ignoring or minimizing the uniquely precarious and unsafe working conditions endured by cannabis workers does a disservice to the industry in addition to the workers themselves. It is not possible to create effective strategies for advancing and destigmatizing the cannabis industry without acknowledging these problems.

Participants in this study, while demographically distinct from other California farmworkers, experienced similar forms of structural violence. Experiences of abuse and discrimination were ubiquitous, and the greatest concern of participants was wage theft in the form of the agreed-upon piece rate pay being withheld or reduced. The immigration status, perceived race, and gender of participants was intentionally used as leverage to perform this wage theft in workplaces with rampant bullying and sometimes physically violent abuse by supervisors. The criminalization of cannabis cultivation creates additional avenues for owner control of workers, in addition to a secondary legal violence beyond that inflicted by the immigration policing system in the form of law enforcement raids of cannabis workplaces. These complex and intersecting forms of structural violence are difficult to tease apart and impossible to meaningfully rank, but the primary specific concerns of participants beyond wage theft were police interactions and, for women, sexual assault.

Recommendations

The legalization or decriminalization of cannabis at the federal level will be an important step in advancing the health and safety of cannabis workers (Schenker & Beckman, 2022). In addition to expanding access to licensing, banking, and occupational health resources, federal legalization or decriminalization will likely reduce workers’ interactions with law enforcement. There is potential for a unified, streamlined licensing approach at the federal, state, and local levels that includes equity programs to advance the health of marginalized workers (Stoa, 2021). The difficulty and expense of licensing and regulatory compliance in California is likely responsible for the large market share of illegally grown cannabis in the state

(Sumner et al., 2020). Previous reports of cannabis workplace violence have focused on robberies and assaults (Washington State Department of Labor & Industries, 2020), but this analysis has revealed that structural violence, including the threat and enactment of legal violence, is a key source of workplace violence experienced by seasonal trimmers. It is telling that despite experiences like being threatened with guns by their employers, participants ranked interactions with police as one of their main fears on the job. However, legalizing cannabis will not prevent business owners from leveraging workers' documentation status to perform wage theft. Recommending actions to reduce the violence of U.S. immigration policy and enforcement are beyond the scope of this analysis.

Another critical need for advancing cannabis worker health is widespread access to culturally appropriate training and education on workplace hazards (Schenker & Beckman, 2022). In addition to the occupational health and safety regulations governing all workplaces, California-licensed cannabis businesses are required to provide additional industry-specific health and safety training. However, none of the study participants was aware of the requirement and none had received health or safety training—to paraphrase one participant, if they do not even know if they are going to be paid, of course there is no safety training. Given the low percentage of licensed cannabis farms, educational materials that are broadly available and promoted by avenues directly accessible by workers are needed. In addition, materials accessible to workers with limited literacy, such as videos translated into Spanish, Hmong, and perhaps other languages, will

be required to meet the needs of the ongoing demographic shift among seasonal workers. Outreach to the most vulnerable cannabis worker groups is challenging due to geographic and social isolation and the potential for violence and retaliation by owners, which is anticipated to be more severe in businesses employing trafficked workers. One nonprofit has had success discreetly passing small information cards to workers during community vaccination and health clinics (Hernandez, 2021); this system could be used to communicate resources to workers who may be too fearful of repercussions at work to be approached directly.

Finally, this study and analysis represent a first step in understanding the health and safety of marginalized seasonal and immigrant cannabis workers, but further research is needed. Collaboration with cannabis workers will be essential to ensure that their unique needs are met and that any interventions are both desired and effective. There is little research overall on cannabis worker health and safety, and both quantitative assessments of exposures and outcomes and further qualitative work can identify the immediate and long-term needs of workers as well as guide health interventions and policy actions to protect worker health. 

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References

- August, K. (2013). Women in the marijuana industry. *Humboldt Journal of Social Relations*, 1(35), 89–103. <https://doi.org/10.55671/0160-4341.1189>
- Barcott, B., Whitney, B., & Bailey, J. (2021). *Leafly Jobs Report 2021*. <https://leafly-cms-production.imgix.net/wp-content/uploads/2021/02/13180206/Leafly-JobsReport-2021-v14.pdf>
- Beckman, S., Castañeda, X., Rivas, L., & Schenker, M. B. (2022). California cannabis cultivation and processing workers: A qualitative analysis of physiological exposures and health effects. *American Journal of Industrial Medicine*, 66(1), 75–84. <https://doi.org/10.1002/ajim.23442>
- Beckman, S., Langer, C. E., & Schenker, M. B. (2022). A pilot study of respiratory and dermal symptoms in California cannabis cultivation workers. *Journal of Agromedicine*, 28(1), 28–35. <https://doi.org/10.1080/1059924X.2022.2141407>

- Benson, P. (2008). EL CAMPO: Faciality and structural violence in farm labor camps. *Cultural Anthropology*, 23(4), 589–629. <https://doi.org/10.1111/j.1548-1360.2008.00020.x>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Campos, I. (2018). Mexicans and the origins of marijuana prohibition in the United States: A reassessment. *The Social History of Alcohol and Drugs*, 32, 6–37. <https://doi.org/10.1086/SHAD3201006>
- Chan, D. K.-S., Chow, S. Y., Lam, C. B., & Cheung, S. F. (2008). Examining the job-related, psychological, and physical outcomes of workplace sexual harassment: A meta-analytic review. *Psychology of Women Quarterly*, 32(4), 362–376. <https://doi.org/10.1111/j.1471-6402.2008.00451.x>
- Department of Cannabis Control [DCC], California. (2022, July 21). *California cannabis enforcement efforts help protect people, the environment, and the legal market* [Announcement]. <https://cannabis.ca.gov/2022/07/california-cannabis-enforcement-efforts-help-protect-people-the-environment-and-the-legal-market/>
- DeVylder, J. E., Anglin, D. M., Bowleg, L., Fedina, L., & Link, B. G. (2022). Police violence and public health. *Annual Review of Clinical Psychology*, 18, 527–552. <https://doi.org/10.1146/annurev-clinpsy-072720-020644>
- Dillis, C., Biber, E., Bodwitch, H., Butsic, V., Carah, J., Parker-Shames, P., Polson, M., & Grantham, T. (2021). Shifting geographies of legal cannabis production in California. *Land Use Policy*, 105, Article 105369. <https://doi.org/10.1016/j.landusepol.2021.105369>
- Elovainio, M., Kivimäki, M., & Vahtera, J. (2002). Organizational justice: Evidence of a new psychosocial predictor of health. *American Journal of Public Health*, 92, 105–108. <https://doi.org/10.2105/AJPH.92.1.105>
- Farmer, P. E., Nizeye, B., Stulac, S., & Keshavjee, S. (2006). Structural violence and clinical medicine. *PLoS Medicine*, 3(10), Article e449. <https://doi.org/10.1371/journal.pmed.0030449>
- Fertig, N., & Mueller, E. (2022, October 2). 'Real people that we care about are being exploited.' *POLITICO*. <https://www.politico.com/news/magazine/2022/10/02/weed-cannabis-undocumented-immigrants-00059827>
- Fussell, E. (2011). The deportation threat dynamic and victimization of Latino migrants: Wage theft and robbery. *The Sociological Quarterly*, 52(4), 593–615. <https://doi.org/10.1111/j.1533-8525.2011.01221.x>
- Hacker, K., Anies, M., Folb, B. L., & Zallman, L. (2015). Barriers to health care for undocumented immigrants: A literature review. *Risk Management and Healthcare Policy*, 8, 175–183. <https://doi.org/10.2147/RMHP.S70173>
- Hamilton, K. (2018, April 19). California's legal weed farms are replacing trimmigrants with immigrants. *VICE News*. <https://news.vice.com/en/article/evq7gn/californias-legal-weed-farms-are-replacing-trimmigrants-with-immigrants>
- Hernandez, R. (2021, November 17). *Immigrant workers on illegal marijuana farms struggle with working conditions*. Oregon Public Broadcasting. <https://www.opb.org/article/2021/11/17/immigrant-workers-on-illegal-marijuana-farms-struggle-with-working-conditions/>
- Holmes, S. M. (2013). *Fresh fruit, broken bodies: Migrant farmworkers in the United States*. University of California Press. <https://www.jstor.org/stable/10.1525/j.ctt7zw45x>
- Kim, N. J.-E., Vásquez, V. B., Torres, E., Nicola, R. M. B., & Karr, C. (2016). Breaking the silence: Sexual harassment of Mexican women farmworkers. *Journal of Agromedicine*, 21(2), 154–162. <https://doi.org/10.1080/1059924X.2016.1143903>
- Lopez, S. H., Hodson, R., & Roscigno, V. J. (2009). Power, status, and abuse at work: General and sexual harassment compared. *The Sociological Quarterly*, 50(1), 3–27. <https://doi.org/10.1111/j.1533-8525.2008.01131.x>
- Menjívar, C., & Abrego, L. J. (2012). Legal violence: Immigration law and the lives of Central American immigrants. *American Journal of Sociology*, 117(5), 1380–1421. <https://doi.org/10.1086/663575>
- Miles-McLean, H., Liss, M., Erchull, M. J., Robertson, C. M., Hagerman, C., Gnoleba, M. A., & Papp, L. J. (2015). "Stop looking at me!" *Psychology of Women Quarterly*, 39(3), 363–374. <https://doi.org/10.1177/0361684314561018>
- Misra, S., Kwon, S. C., Abraído-Lanza, A. F., Chebli, P., Trinh-Shevrin, C., & Yi, S. S. (2021). Structural racism and immigrant health in the United States. *Health Education & Behavior*, 48(3), 332–341. <https://doi.org/10.1177/10901981211010676>

- Morgan, A., & Ziglio, E. (2007). Revitalising the evidence base for public health: An assets model. *Promotion & Education*, 14(2-Suppl.), 17–22. <https://doi.org/10.1177/10253823070140020701x>
- Moyce, S. C., & Schenker, M. (2018). Migrant workers and their occupational health and safety. *Annual Reviews of Public Health*, 39, 351–365. <https://doi.org/10.1146/annurev-publhealth-040617-013714>
- Murray, L. R. (2003). Sick and tired of being sick and tired: Scientific evidence, methods, and research implications for racial and ethnic disparities in occupational health. *American Journal of Public Health*, 93, 221–226. <https://doi.org/10.2105/AJPH.93.2.221>
- National Conference of State Legislatures. (2023, April 17). *State medical cannabis laws*. <https://www.ncsl.org/health/state-medical-cannabis-laws>
- Okechukwu, C. A., Souza, K., Davis, K. D., & de Castro, A. B. (2013). Discrimination, harassment, abuse and bullying in the workplace: Contribution of workplace injustice to occupational health disparities. *American Journal of Industrial Medicine*, 57(5), 573–586. <https://doi.org/10.1002/ajim.22221>
- Ornelas, I., Fung, W., Gabbard, S., & Carroll, D. (2022). *California findings from the National Agricultural Workers Survey (NAWS) 2015–2019: A demographic and employment profile of California farmworkers* (Research Report No. 15). JBS International. <https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS%20Research%20Report%202015.pdf>
- Otañez, M., & Grewal, J. (2021). Health and safety in the legal cannabis industry before and during COVID-19. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*, 30(4), 311–323. <https://doi.org/10.1177/1048291120976134>
- Parfitt, J. (2021, August 21/Updated 2022, January 12). Hundreds of workers released after raid on illegal marijuana grow near Kerby. *NewsWatch 12 KDRV*. https://www.kdrv.com/news/local/hundreds-of-workers-released-after-raid-on-illegal-marijuana-grow-near-kerby/article_0292b6a1-55b0-5fb3-a298-316716784cae.html
- Phelan, J. C., & Link, B. G. (2015). Is racism a fundamental cause of inequalities in health? *Annual Review of Sociology*, 41, 311–330. <https://doi.org/10.1146/annurev-soc-073014-112305>
- Philbin, M. M., Flake, M., Hatzenbuehler, M. L., & Hirsch, J. S. (2018). State-level immigration and immigrant-focused policies as drivers of Latino health disparities in the United States. *Social Science & Medicine*, 199, 29–38. <https://doi.org/10.1016/j.socscimed.2017.04.007>
- Raskin, J. (2016, December 2). Marijuana industry’s unseen workforce: The ‘trimmigrants.’ *San Francisco Chronicle*. <https://www.sfchronicle.com/opinion/article/Marijuana-industry-s-unseen-workforce-the-10688637.php>
- Reskin, B. (2012). The race discrimination system. *Annual Review of Sociology*, 38, 17–35. <https://doi.org/10.1146/annurev-soc-071811-145508>
- Robinson, M. (2016, October 5). Being a “trimmigrant” is one of the hardest jobs in the marijuana black market. *Business Insider*. <https://www.businessinsider.com/life-of-trimmigrants-2016-10>
- Sack, C., Ghodsian, N., Jansen, K., Silvey, B., & Simpson, C. D. (2020). Allergic and respiratory symptoms in employees of indoor cannabis grow facilities. *Annals of Work Exposures and Health*, 64(7), 754–764. <https://doi.org/10.1093/annweh/wxaa050>
- Sbicca, J., Minkoff-Zern, L.-A., & Coopwood, S. (2020). “Because they are connected”: Linking structural inequalities in farmworker organizing. *Human Geography*, 13(3), 263–276. <https://doi.org/10.1177/1942778620962045>
- Schenker, M. B., & Beckman, S. (2022). Cannabis industry worker health and safety: Time for action. *Journal of Agromedicine*, 28(1), 14–17. <https://doi.org/10.1080/1059924X.2022.2148031>
- Smith, V. M., Powell, M., Mungeam, D., & Emmons, R. G. (2019). Stakeholder perceptions of the impact of cannabis production on the southern Oregon food system. *Journal of Agriculture, Food Systems, and Community Development*, 8(4), 125–135. <https://doi.org/10.5304/jafscd.2019.084.012>
- St. John, P. (2022, September 8). The reality of legal weed in California: Huge illegal grows, violence, worker exploitation and deaths. *Los Angeles Times*. <https://www.latimes.com/california/story/2022-09-08/reality-of-legal-weed-in-california-illegal-grows-deaths>

- St. John, P., & Elmahrek, A. (2023, January 29). Lawmakers want investigation, hearings into ‘Wild West’ of California cannabis and farm work. *Los Angeles Times*. <https://www.latimes.com/california/story/2023-01-29/lawmakers-want-investigation-hearings-into-the-wild-wild-west-of-california-cannabis-and-farm-work>
- Stoa, R. (2021). Equity in cannabis agriculture (SSRN Scholarly Paper ID 3832228). *Boston University Law Review*, 101(3). Retrieved from SSRN: <https://ssrn.com/abstract=3832228>
- Sugie, N. F., & Turney, K. (2017). Beyond incarceration: Criminal justice contact and mental health. *American Sociological Review*, 82(4), 719–743. <https://doi.org/10.1177/0003122417713188>
- Sumner, D. A., Goldstein, R., Matthews, W. A., & Sambucci, O. (2020). Cannabis in California. In P. L. Martin, R. E. Goodhue, & B. D. Wright (Eds.), *California agriculture: Dimensions and issues, 2nd Edition* (pp. 281–299). Giannini Foundation of Agricultural Economics, University of California. https://s.giannini.ucop.edu/uploads/pub/2021/01/21/chapter_13_cannabis_2020.pdf
- U.S. National Archives and Records Administration: Office of the Federal Register. (2021). Protection of human subjects. In *Public Welfare. Title 45*. Office of the Federal Register, National Archives and Records Administration. <https://www.govinfo.gov/app/details/CFR-2021-title45-vol1/CFR-2021-title45-vol1-part46>
- U.S. Drug Enforcement Agency [U.S. DEA]. (n.d.). *Domestic Cannabis Suppression / Eradication Program*. Retrieved November 9, 2022, from <https://www.dea.gov/operations/eradication-program>
- Velie, K. (2018, October 18). Immigrants find themselves captive to marijuana harvest. *Cal Coast News*. <https://calcoastnews.com/2018/10/immigrants-find-themselves-captive-to-marijuana-harvest/>
- Walters, K. M., Fisher, G. G., & Tenney, L. (2018). An overview of health and safety in the Colorado cannabis industry. *American Journal of Industrial Medicine*, 61(6), 451–461. <https://doi.org/10.1002/ajim.22834>
- Washington State Department of Labor & Industries. (2020). *SHARP Stats: Cannabis 2020 update: Injury and illness in the legal cannabis industry* (SHARP Publication No. 76-21-2020). https://www.lni.wa.gov/safety-health/safety-research/files/2020/76_21_2020_Cannabis_2020Update3.pdf
- Waugh, I. M. (2010). Examining the sexual harassment experiences of Mexican immigrant farmworking women. *Violence Against Women*, 16(3), 237–261. <https://doi.org/10.1177/1077801209360857>
- Wilson, S. (2022, August 21). The casualties of California legalizing pot: Growers who went legal. *The Washington Post*. <https://www.washingtonpost.com/nation/2022/08/21/california-marijuana-farms-failing/>

Indigenous food systems and food sovereignty: A collaborative conversation from the American Association of Geographers 2022 Annual Meeting

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Abstract

Indigenous scholars and their allies increasingly contribute to food systems debates and practices through pursuing and interrogating ideas of

Indigenous food sovereignty. This essay adds to this ongoing conversation by providing a synthesis of and reflection on a panel session on Indigenous food sovereignty held at the American Association of Geographers (AAG) 2022 Annual Meeting. We place this conversation in the context of a growing body of scholarship on food sovereignty and Indigenous food systems. Organized by the AAG's Geographies of Food and Agriculture Specialty Group, with support from the *Journal of Agriculture, Food Systems and Community Development*, the session engaged Indigenous scholars in a discussion about the meaning of food sovereignty, different ways of knowing, relationships and reciprocity, and systems of power. The panelists emphasized the relationship between all elements of creation at the core of food sovereignty, the importance of valuing different ways of knowing and expertise, making visible histories of settler knowledge appropriation, and critically assessing how power manifests, operates, and is understood in different food systems and

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worldviews. Building on the scholarly literature and the evolving place-based grounding of food sovereignty movements, we argue that it is critical to address ongoing realities of genocide and settler colonialism in North America/Turtle Island by forging respectful relationships with all of creation

and to work through collaborations led by Indigenous people and grounded in reciprocity.

Keywords

Indigenous Food Systems, Food Sovereignty, Reciprocity, North America, Turtle Island

The Ohénton Karihwentéh'kwen—A Thanksgiving Address

The Ohénton Karihwentéh'kwen or “The Words That Come Before All Else” is a form of giving thanks delivered at the opening and closing of all gatherings among the Haudenosaunee. This Thanksgiving Address is a way to bring all our minds together as one in acknowledgement of creation and its significance. Our food systems are a part of this process.

We start with the people and bring our minds together and give thanks, and we acknowledge our relatives, our families and those around us and give our greatest greetings and thanks and now our minds are one. We will turn our minds and give thanks to our mother earth, it is the mother that sustains and supports us, and so we give our greatest greetings and thanks to our mother the earth, and now our minds are one.

And we will turn our minds and give thanks for the water that flows on the earth and quenches our thirst and helps to nourish the plants and the animals, and so we turn our minds to the waters and give our greatest greetings and thanks and now our minds are one.

We turn our minds and give thanks to the fish. The fish move about in those waters and they act like the immune system for the water and keep it healthy. And so, for providing us as human beings with food and nourishment, and for keeping those waters healthy, we give our greatest greetings and thanks to the fish and now our minds are one.

We'll turn our minds and give thanks to the plant life on our mother the earth, from the grasses that grow and the foods that sustain and support us. As Haudenosaunee, we acknowledge the food for providing substance and for supporting human life. We recognize the three sisters, corn, beans, and squash, as being the sustainers of life. So, to those foods and to those plant life, we give our greatest greetings and thanks and now our minds are one.

We'll turn our minds and give thanks to the berries, we believe that the strawberry is the leader and hopefully soon we'll be seeing those berries again. The strawberry is like a gateway to all those other berries, and as the different berries present themselves they gradually move away from the Mother Earth, and move higher and higher as the season goes. And so, to those berries, we give our greatest greetings and thanks and now our minds are one.

We'll turn our minds and give thanks to the trees, we acknowledge the maple tree as the leader of the trees because it provides us with the sweet water in the spring that helps to cleanse our bodies. The trees provided us with medicine, food, and the heat to prepare our foods. And so, to those trees we give our greatest greetings and thanks and now our minds are one.

—*Excerpt from the Ohénton Karihwentéh'kwen (Thanksgiving Address, 2022) offered by Suzanne Brant*

Introduction

For several decades, the global food sovereignty movement has celebrated the knowledge and experience of peasant farmers and fishers, and has sought to preserve land-based relationships and remake systems of power (Desmarais, 2007). Much of this work is rooted in the right to food (Patel, 2009) and grounded in social and environmental justice that seeks to make deep structural changes in the dominant capitalist food system (Holt Giménez & Shattuck, 2011). More recently in North America/Turtle Island, there has been growing attention to long-standing efforts toward food systems resurgence in Indigenous communities.¹ Indigenous scholars and their allies increasingly contribute to food systems debates and practices through pursuing and interrogating ideas of Indigenous food sovereignty (Coté, 2016; Morrison, 2011). This scholarship, and the traditional knowledge and practice upon which much of it is grounded, posits that food systems, the environment, and all of creation benefit from Indigenous communities asserting their self-determination and taking control of food systems.

In recognition of this essential area of focus and at the request of members of the Geographies of Food and Agriculture Specialty Group (GFASG) of the American Association of Geographers (AAG),² a plenary panel session was organized at the 2022 AAG Annual Meeting to bring together Indigenous food systems scholars and practitioners to be part of a collaborative conversation. This paper presents a synthesis of that conversation in order to expand understanding about the foundations of Indigenous food sovereignty, ongoing related debates, and implications for action. By presenting the plenary conversation in the context of a growing body of scholarship, we argue that it is necessary to expand the ways we think about healthy, equitable, and sustainable food systems in North America/Turtle Island, particularly through addressing histories of anti-Indigenous racism and settler colonialism and working in collaborations that are led by Indigenous people.

The AAG session focused on the meaning of food sovereignty, different ways of knowing, relationships and reciprocity, and systems of power. We began the session with the Ohénton Karihwentéh'kwen, a Thanksgiving Address that recognizes the connections and contributions of all living beings in sustaining life. (An excerpt has been provided at the beginning of this article.) During the Ohénton Karihwentéh'kwen, each element in creation is acknowledged for its role in the creation process and our continuance as human beings. The Ohénton Karihwentéh'kwen gives thanks to all elements of creation and recognizes their interconnectedness. These words are very powerful because they remind us of our responsibilities to the natural world and how we fit within the web of creation. The address reminds us of our interdependence with all creation and the great abundance we have been given. It is through the Ohénton Karihwentéh'kwen that we are reminded that we are unable to exist without all of creation and, specifically, those food systems within creation.

The Ohénton Karihwentéh'kwen excerpt demonstrates the importance of reciprocity within human and more-than-human relationships, especially for building more equitable and sustainable food systems. Throughout this paper, we intentionally forefront the voices of the plenary speakers, but we also recognize that they provide only two perspectives from a diversity of approaches and ways of knowing. As such, we place their comments in conversation with the growing literature on Indigenous food sovereignty.

In what follows, we begin with a brief review of food sovereignty and Indigenous food systems literature. We then describe in greater detail how the collaborative conversation came together and provide synthesized text from the plenary session. There follows a discussion about how the conversation can further food systems scholarship and practice by expanding how we think about healthy, equitable, and sustainable food systems in North America/Turtle Island. We conclude with recommendations for moving these insights forward.

¹ The term “Indigenous” is used to refer to the original inhabitants of what is now known as North America/Turtle Island. This includes over 1,500 groups that have distinct cultures, languages, and histories.

² For more information on the GFASG, see <https://gfasg.wordpress.com>

Food Sovereignty and Indigenous Food Systems Scholarship

At the landmark Forum for Food Sovereignty in Sélingué, Mali, featuring grassroots activists and food producers from all over the world, food sovereignty was defined as follows:

the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. ... Food sovereignty prioritizes local and national economies and markets and empowers peasant and family farmer-driven agriculture, artisanal-fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability. (Declaration of Nyéléni, 2007, para. 3)

The history of food sovereignty can be traced to political movements in the 1960s–1980s in response to globalization and market liberalization and associated with ideas of food self-sufficiency (Chaifetz & Jagger, 2014; Coté, 2016). Following La Via Campesina's call for food sovereignty at the 1996 World Food Summit, the concept was taken up by activists, growers, and academics worldwide (Grey & Patel, 2014; Wittman et al., 2010). Those active in early transnational social movements viewed food sovereignty as a fundamental challenge to neoliberal models of capitalist agriculture along with the recognition of food's social and cultural connections to people and place.

As food sovereignty has come to be approached in different ways worldwide, debates have emerged to question the meaning and applicability of the term “sovereignty” in different contexts (Agarwal, 2014; Edelman et al., 2014; Wittman, 2011), including questions about the applicability of food sovereignty in different geographic contexts and scales. For example, Fairbairn (2012) argued that food sovereignty in North America/Turtle Island lost its radical potential as it became co-opted by more mainstream food initiatives and associated with fair trade. Some scholars have questioned the applicability of food sovereignty in urban food movements, including efforts toward

food justice (Block et al., 2012). Others have pointed out that a focus on local food or fair trade ignores food sovereignty's foundations in land reform, market relations, and political sovereignty (Kepkiewicz & Rotz, 2018). There have also been questions raised about the agro-centric nature of the ways that food sovereignty has been described and applied (Levkoe et al., 2017).

Because food sovereignty is context-specific and place-dependent, food movements have been animated by a nexus of localized concerns. For example, movements have focused on agricultural production, the restoration of environmentally friendly agricultural methods, and Indigenous health (Desmarais & Wittman, 2014; Ray et al., 2019). Others have emphasized the rejuvenation of cultural practices surrounding food and renewed focus on Indigenous foodways as a means of cultural restoration (Daigle, 2019; Grey & Newman, 2018; Robin, 2019). For example, Kamal et al. (2015) present the *O-Pipon-Na-Piwin* Cree Nation's a community-based food program, *Ithinto Mechisonwin* (“food from the land”), in northern Manitoba that emphasizes a reconnection with land and culturally appropriate healthy food as an inspiring example of strengthening Indigenous food sovereignty.

Indigenous Food Sovereignty

Debates about the applicability of food sovereignty call attention to its place-based dimensions. Scholars have emphasized that food sovereignty movements must contend with the particularities and histories of different contexts (Wittman et al., 2010). In North America/Turtle Island, this demands an engagement with Indigenous food systems, in theory and practice, along with the ongoing realities of settler colonialism and genocide (Coté, 2016; Levkoe et al., 2019; Martens et al., 2016).

Among Indigenous scholars, food sovereignty has encompassed a plurality of methods for reclaiming Indigenous cultural autonomy, self-sufficiency, and land (Whyte, 2016). Indigenous food sovereignty is an approach to understanding how the regeneration of Indigenous food systems and practices contributes to decolonizing efforts, resisting state power, and achieving self-determina-

tion (Daigle, 2019). It brings everyday practices of resurgence and reciprocity, Indigenous ontologies, and human and more-than-human relationships to the forefront. Whyte (2016) argues that despite the potentially Pollyannaish language of food self-sufficiency and cultural revitalization employed by some activists and scholars, the movement is understood by at least some Indigenous people in North America/Turtle Island as an attempt to reclaim the ecological value of foods undervalued by settler colonialism.

In this paper, we use North America/Turtle Island as the geographic unit of analysis. This is appropriate for two reasons. First, the border separating present-day Canada from the United States is a colonial construct; second, both Indigenous authors are of Kanyen'kehá:ka, or Mohawk, ancestry. The Mohawk are one of six nations united under the Haudenosaunee Confederacy whose traditional territories span the aforementioned colonial borders. This approach, while potentially eliding some distinctions, is present in the scholarship. While there is more Indigenous food systems scholarship emerging from Canada (e.g., Daschuk, 2013; Robidoux & Mason, 2017; Settee & Shukla, 2020), there is increasing research from the United States as well (Mihesuah & Hoover, 2019; Ruelle, 2017). Building on this literature and practice, we argue that it is essential to address the gaps in food systems scholarship through increased learning about Indigenous food systems, which should be pursued through collaborative action led by or with Indigenous peoples and supporting Indigenous peoples to advance self-determination and sovereignty.

Methods

This paper emerges from the GFASG plenary session at the AAG Annual Meeting in February 2022. This session was organized by the GFASG in collaboration with the *Journal of Agriculture, Food Systems, and Community Development* (JAFSCD). JAFSCD has long been a supporter of GFASG scholar-activist sessions and of scholar-activist work through publishing reflective essays about similar discussions among scholars and practitioners focused on critical food systems topics (de Witt et al., 2021; Hammelman et al., 2020; Klassen et al.,

2022; Levkoe et al., 2016, 2018; Rice & Goldberg, 2021; also see the JAFSCD special issue on Indigenous Food Sovereignty in North America, volume 9, supplement 2, 2019).

In 2021, GFASG and JAFSCD leadership surveyed their members to identify topics of interest for the 2022 plenary session. The same electronic survey was sent separately to the membership lists for each group. At that time, there were approximately 450 GFASG members and 260 JAFSCD shareholders as well as editors and advisors, a majority of whom are located in North America/Turtle Island. Forty-five people completed the survey that requested input on potential topics and speakers. Indigenous food systems, food justice, and academic-practitioner collaborations were ranked in the top three most desired topics and/or speaker focus. In response to the survey results, the GFASG session organizers (Colleen Hammelman and Jesse Andrews) invited several scholars and practitioners dedicated to Indigenous food systems and sovereignty in North America/Turtle Island to participate in the session. The organizers invited Charles Levkoe to facilitate the session as the past chair of the GFASG. Colleen, Jesse, and Charles are all settler scholars based at academic institutions in North America/Turtle Island with research programs aligned with food sovereignty, justice, and sustainability.

Co-authors of this paper (Suzanne Brant and Keith Williams) agreed to share their work and discuss how it intersects with multiple systems of power, place-based relationships, scholar-activism/activist-scholarship, and political ecology. Suzanne is Mohawk from Tyendinaga and is president and CEO of First Nations Technical Institute (FNTI), providing leadership and innovation in Indigenous post-secondary education. She earned a master's degree from York University in environmental studies, concentrating on Indigenous post-secondary programming. Suzanne is an accomplished visual artist and photographer and a seasoned gardener and grower, specializing in Haudenosaunee traditional food systems and medicine plants. Keith is the director of research and social innovation at FNTI and a member of JAFSCD's Indigenous Editorial Circle. He is Mohawk and Dutch on his father's side and is interested in

better understanding how Indigenous ways of being and ways of knowing can help to create a more equitable future for humanity and all our relations.³

In preparation for the plenary session, the speakers and organizers (all co-authors) met several times to identify specific topics of discussion grounded in their expertise and experience. Collectively, they decided to dedicate the plenary discussion to questions regarding the meaning of food sovereignty, reconciling different ways of knowing, and how power operates in food systems work. The session was recorded and transcribed. The co-author team reviewed the transcript for emergent themes and identified the contributions the conversation makes to Indigenous food systems and sovereignty literature. More specifically, co-authors Jesse Andrews, Colleen Hammelman, and Charles Levkoe coded the transcript for recurring themes. The overarching topics and key passages were revisited by co-authors Suzanne Brant and Keith Williams for confirmation and further explanation.

Our objective in developing this paper was to share session learnings with a wider audience through making available the conversation that occurred during the session (in part through directly quoting session comments, in the next section). While speakers provided their specific perspectives during the session, it took a more conversational format, which we aim to replicate here. This approach is important for enabling the speakers to directly share their expertise while also recognizing the relational nature of knowledge production.

The Conversation

In this section we present a synthesis of the conversation, categorized into key themes centered on (1) human and more-than-human relationships, (2) reconciling different ways of knowing, and (3) intersections with systems of power. The speakers argued that food sovereignty is best understood as a natural system of human interaction with plants and animals grounded in respect and reciprocity. Its foundation is in interdependence and self-

determination, but those are not possible without establishing webs of relationships. They also discussed disconnects between Western/European and Indigenous ways of knowing, such as the ways in which colonial approaches to science seek to categorize and sort while Indigenous systems emanate from interconnections among everything. It is also important to recognize settler colonial systems that have supported Western/European science often at the severe expense of Indigenous peoples, through, in part, appropriation and redistribution of their lands (see Nash, 2019 for further elaboration on how the institutionalization of Western/European science has produced such oppressions). Finally, this conversation points to differing systems and ideas of power. The speakers identify power as the ability to continue our existence in concert with more-than-human life. We argue for the need to draw on Indigenous understandings of power as part of decolonizing food systems.

Human and More-Than-Human Relationships Grounded in Respect, Responsibility, and Reciprocity

Suzanne Brant: In our traditional practices we go through the Thanksgiving Address. You can see in every element that there is a relationship between all those elements of creation, and all those interconnected elements that support us as human beings. For our foods, when we look at the relationship that we have with the foods, they have a certain way of growing and a certain relationship with one another and with the rest of creation. When we eat those foods, they become a part of us and eventually support us through our own interaction with creation. And eventually, when we are done with this body, we will feed the soil, which then feeds the plants again. There is a reciprocity that takes place. *Food sovereignty is about supporting that natural system of interacting and working with foods, using them, and respecting them.*

We have different ways and practices among Indigenous cultures around the world. We had amazing trade routes, and we would share foods

³ Latashia Redhouse, American Indian foods director at the Intertribal Agricultural Council, also helped to conceive of the plenary panel topics and format. While she was not able to participate in the formal discussion, we are grateful for her insights.

and other trade goods from north to south and vice versa. This understanding is based on both our traditional teachings, and Western/European scholarship (Baugh & Ericson, 2013; Fritz, 2022). It was a way to nurture our collective well-being and to support ourselves. Suggestive evidence of these north-south pre-Columbian trade routes can be seen, for example, in the morphological similarity between the Kahnawake bean named after the Kahnawake Mohawk community in southern Quebec and the Rarámuri Ojo de Cabra bean from Chihuahua state in northern Mexico. Those interactions between one another and with the plants are critical to maintaining a good mind, or *ka'nikonhriio*, which allows us to make good decisions and to understand our relationship with all of creation. Those foods communicate directly with us. They have phytochemicals that interact with our bodies. And we are bringing our connections with the plants, our food, and each other back by reintroducing our traditional methods of growing, preparing, eating, and preserving our traditional foods. This reinforces food sovereignty. Today, we eat only a few different varieties of food and tend to go to the grocery store every week where we purchase the same food each time. That's not sovereignty. Food sovereignty is when you can actually grow the seeds, harvest from the natural world, and prepare what has been provided by creation. Knowing the hardship of not being able to access our foods nurtures our responsibility for looking after creation.

Keith Williams: Foods communicate with us. Posthumanism, new materialism, as well as critical plant studies all recognize the animacy of the vibrant material world, including other creatures. But coming from a Haudenosaunee place, this is not post-humanism, it is pre-humanism. Much of what appears novel now has been on our radar for millennia. There is a traditional teaching that instructs us to share the harvest with our families, neighbors, and the animals. I take that seriously, during harvest season, and make sure that there's always something to share with others.

A member of the JAFSCD Indigenous Food Sovereignty Editorial Circle asked the question, when we're considering research ethics associated

with doing work with humans: "Why is it that we don't include seeds and other beings?" You could also extend that to all plants, rivers, rocks and animals. I'd love to see a shift away from the kind of human exceptionalism that frames so many conversations. Those beings that we call food also have lives and thoughts, dreams, and aspirations. Without relationships to those beings, we are nothing. I think of all the interesting findings that corroborate these ideas in contemporary philosophy and neuroscience, but what's at the vanguard in certain academic fields has long been understood by Indigenous communities.

It is important to give those plants space to have full lives. You could call these examples of affective reciprocity, affective in both the broad Deleuzian sense referring to a change in physical, psychological, emotional, social states, but also in a more restrictive sense, referring to the emotional register. Sarah Ahmed talks about how affect is sticky, and it preserves connections between values and objects. *I see affective reciprocity as the glue that makes food sovereignty work. There's something interesting here, food sovereignty is about independence and self-determination on one level. But we can't have that without webs of relationships.*

Reconciling Different Ways of Knowing

Suzanne Brant: There are lots of opportunities to bring knowledge systems together. The critical part is acknowledging the existence of those different knowledge systems. For us as Haudenosaunee, we recognize there are two paths and two minds in the way that we approach the earth and life. We talk about the canoe going down the river and there's a lot of things in that canoe that help us to understand relationships and how to interact: how to look at the world and how to exist within creation and ensure our continuance as human beings. Our interconnectedness with creation is critical to our continuance as demonstrated in the Thanksgiving Address.

Recent advances in scientific thought echo Indigenous understandings of the natural world. *But the challenge is that Western science puts ideas into boxes that don't often overlap. Through an Indigenous knowledge system that involves looking at the interconnec-*

tions among everything and how it all interacts, you can bring in those sciences to support interaction and interconnection. For example, in integrative food systems research, we can look at interactions between food-based biochemicals and the body and then consider extending that research and understanding to our relationships with place. Just watching the seed and observing, it gives you a different perspective. I honestly believe there is a great opportunity to merge these different knowledge systems.

Keith Williams: Talking about bringing knowledges together makes me think about the importance of transdisciplinarity. This has been inherent in Indigenous ways of knowing and ways of being since the beginning of time. Mi'kmaw Elder Albert Marshall developed the notions of Two-Eyed Seeing to help Indigenous science students who walk in two worlds (Bartlett et al., 2012). It enabled them to embrace the best of Western science and of Indigenous traditional knowledge and to use those knowledges to make their way through the world. Considering how to reconcile those different ways of knowing raises questions about if and how the academy might be decolonized. *Indigenous knowledge systems—in addition to being actively suppressed since 1492—have not enjoyed the kind of political and financial support afforded to mainstream centers of knowledge production, such as universities.* Indigenous institutes have a lot of potential to articulate Indigenous knowledge systems with Knowledge Keepers and Elders in equitable conversation.

The academy could leverage their inordinate privilege to advance Indigenous self-determination. There are many ways to do this, and it must go well beyond targeted hiring. For example, most universities have extensive land holdings, many of which were donated as bequeathments. Most, if not all Indigenous nations' land holdings were decimated, or worse, by colonial governments. Land is the wellspring of life and food; but, also, land is the wellspring or foundation of Indigenous thought. Land is the foundation of everything. Most non-Indigenous cultures are far removed from that reality. University-owned land could be returned, or universities could develop customized training programs for local Indigenous institutions in collabora-

tion with the Nations close to them. This idea, Land Back, could begin to address gaps that are identified.

Indigenous languages are verb-based, and that reflects a process. A verb-based language like Mohawk is up against noun-based languages which work to calcify and fix identity categories. So, *they are literally and figuratively speaking two different languages.* I often wonder that if English is noun-based and relies on these fixed identity categories, what does that do for our ability to imagine a future in which we can adapt and change? How do we reconcile that?

Intersections with Systems of Power

Suzanne Brant: When we look at power as an Indigenous people, the Haudenosaunee use three principles: *skén:nen*, which is peace; *ka'nikonbrí:io*, which is a good mind; *kasasten'sera*, which is strength or sometimes referred to as power. For us, ultimate power is about having a good mind, carrying peace within ourselves, and having strength, which is the assurance for us as human beings to continue the cycle of life. When I look at these ideas of power, it's about all those interconnections and relationships and how they help us to be *Onkwehon:we*—a natural human being.

Today, the struggle over resources and power is a false perception. If human beings cannot have continuance on this earth, what's the sense of all of this? Many people look at power from a financial stance, which is an illusion. There are so many things that we've done as human beings for financial gain, like extraction of oil and toxic elements or the creation of synthetic toxins like PCBs, dioxins, and endocrine disruptors that stop our continuance as a human being. *From a Haudenosaunee perspective, the ability to continue life, the ability to bring forth life as a human being, as men and women, to ensure that humans continue our existence and interaction with creation is really the most powerful thing.*

As Indigenous people around the world, our lives were very fragile. We were solely dependent upon the earth to sustain us, and we had to work with the elements of creation: when we could have food available to us; when we could access those different foods; the timing and space that creation

allowed for those foods to be available; and the systems put in place. When those systems were available to us, we accessed and we honored them, and we gave thanks. That gave us an understanding of how to protect and look after those things that look after us. That is powerful. That is power.

So, when I think about power, I think about this strength and the ability to carry forward in life, to ensure that we have life as a human being for the next seven generations. And we have those teachings that help us to understand what we need to look at and what we need to weigh it against. And if we cannot ensure that whatever we are co-creating ensures life into the next seven generations, we should not be doing that. That is power.

Keith Williams: We see power manifesting in multiple ways. We can start by asking: Who sets the table and how? What are the underlying cultural values that dictate the terms of engagement within food systems? At FNTI, we are looking at speaking back to Empire, using the tools offered by critical theorists and the various posts like the post-structuralists, or post-humanists. But can decolonization be achieved by using those structures? That is where traditional teachings come in. *We can recognize the importance of Western responses to asymmetrical power dynamics, but we also need to draw on our own Indigenous power concepts to fully decolonize.*

Indigenous peoples have developed many ways to connect with what linguist Andrew Cowell (2018) calls more-than-human power. Cowell's work among the Northern Arapaho led to the understanding that:

a person is sacred and powerful because that person literally has within them—or has access to—power derived either from the natural world or from ancestors—both of whom mediate the general [more-than-human] power of the creator, which is immanent in the world. (p. 9)

More-than-human power, in the Haudenosaunee world, is exemplified by the principle of *kasasten'sera*, which is variously translated as strength or power (*Akwesasne Notes*, 2005). Oneida elder Bob Antone (2013) describes *kasasten'sera* as

the power of the collective, and the strength that comes from thought and action unified with all of creation and the cycles of life. More-than-human power is indexed to place and sustained through ceremonies and other activities that strengthen our relationships with all of creation.

At FNTI we draw on that more-than-human power by basing institutional practices, such as strategic planning, on seasonal and other natural cycles, as well as drawing on the logic of the gift economies to connect us to each other. And then with our more-than-human kin, through community gardening, community food sharing, and recital of the Thanksgiving Address. That is a way of speaking with all our relations, the medicine plants, the thunder, the rains, the waters, and the strawberries.

A Collaborative Reflection

Through discussions about the meaning of Indigenous food sovereignty, the conversation pointed to the relationship between all elements of creation at the core of this work. This included working in relation to natural systems, engaging with food from a deep level of respect, involving ceremony and tradition, learning and using Indigenous practices, and sharing foods across spaces and places as a way of sustaining and feeding oneself and the community. For Suzanne and Keith, Indigenous food sovereignty is about moving away from a reliance on the market, and instead growing and harvesting food as part of relationships. This also aligns with the Indigenous food systems literature discussed above that has centered reciprocal relationships between humans and the more-than-human life that sustains them.

Suzanne and Keith also discussed the importance of valuing different ways of knowing. Nonetheless, there has been much conflict as to whether researchers are stealing and/or appropriating Indigenous knowledge or devaluing expertise that does not conform to Western/European knowledge systems. European settler-colonial ways of thinking about relationships in the natural world (with an emphasis on sorting and categorizing) dominate, but bringing together different ways of knowing is essential. For the Haudenosaunee, the Kaswenta or two-row Wampum is a powerful heuristic for guiding Indigenous-settler relations. The

Kaswenta represents the original treaty, from the early 17th century, between the Haudenosaunee people and the Dutch in what is now New York state. It is often depicted as a beaded belt, consisting of two purple rows separated by white wampum beads. The purple rows symbolize boats: one row represents the Dutch and their ship or sailboat, and the other is the Haudenosaunee and their canoe. Both vessels are depicted traveling down the river (or way of life) together, but apart (Parmenter, 2013; Ransom & Ettenger, 2001). This apparent contradiction describes the respective sovereignty of both Indigenous and settler communities but with an obligation to work together to address issues of significant mutual consequence (Hill, 2013). Rather than instantiating and re-entrenching a colonial binary, the Kaswenta can be viewed as structured around the settler-Indigenous duality.

Although the difference may appear semantic, Murphy et al. (2017) assert that dualities are interdependent and not exclusive, whereas dualisms are strictly oppositional. Other Indigenous scholars have brought Indigenous, non-dualistic ways of knowing to the fore. For example, Kimmerer (2013) highlights Indigenous ecological knowledge that centers healthy, balanced relationships between humans, plants, animals, and the more-than-human world. While there are many similarities between the teachings of different Nations, there are also foundational differences because of the place-based specificity inherent in Indigenous knowledge systems. This kind of knowledge is both complex and nuanced, and we advocate for greater attention to this highly localized specificity in order to avoid erasing differences between Nations and to realize fully the potential of Indigenous knowledge to support the resurgence of interest in pre-colonial and self-determined foodways.

In the context of this paper, making visible different ways of knowing and histories of knowledge appropriation is especially important for those working with academic institutions through research partnerships, teaching, and publishing. The conversation noted that respectful and meaningful relationships are essential, which include recognizing that different knowledge systems exist and are dynamic. Suzanne explained that Haudeno-

saunee knowledge is specifically about going out and looking for connections as opposed to reductionist Western/European science approaches that put things into boxes. Bringing in all the different ways of knowing and perspectives is an opportunity to merge different knowledge systems. As a starting point, Keith suggested that this might involve engaging with calls for Land Back. As colonial dispossession of Indigenous lands is well documented, Land Back efforts seek redress for legal and regulatory dispossessions and also for the alienation from land, water, and community caused by the theft of Indigenous territories (Yellowhead Institute, 2019). These efforts include calling upon the many universities that occupy Indigenous lands to return those territories and work toward Indigenous self-determination.

Power and settler colonialism are essential parts of discussions about Indigenous food systems and food sovereignty. It is important to critically assess how power manifests, what it looks like, and how it operates in different food systems and worldviews. Moreover, we need to rethink definitions of power. Power need not be thought of as a zero-sum game and Indigenous people are not victims. Despite centuries of assimilation, marginalization, and genocide, Indigenous peoples and traditions endure. We can look to many Indigenous Elders, Knowledge Keepers, and communities that have taken leadership and advanced the struggle for self-determination, resurgence, and justice. Considering these issues, Suzanne and Keith pointed to inequities surrounding who gets a seat at decision-making tables and how those processes work. Moreover, they reconceptualized power through Haudenosaunee principles of peace, the good mind, and strength, and the idea that power is the ability to and ongoing work of carrying forward life for the next seven generations.

Conclusion

Through presenting a synthesis of the Indigenous Food Sovereignty GFASG plenary session at the 2022 AAG Annual Meeting, in conversation with relevant literature, this paper seeks to further scholarship on Indigenous food systems and sovereignty. We argue that efforts to build healthy, equitable, and sustainable food systems in North Amer-

ica/Turtle Island must center the histories, learnings, and experiences of Indigenous peoples. Given the place-based groundings of food sovereignty movements, it is critical to address ongoing realities of genocide and settler colonialism in North America/Turtle Island, the ongoing impacts of dispossession on food systems and all of creation, and work through collaborations led by Indigenous people and grounded in reciprocity.

In practice, this means building meaningful relationships and seeking out interconnections and breaking down knowledge systems focused on categorization and separation. The plenary speakers provided examples from integrative food systems research that attend to relationships between food-based biochemicals, bodies, and places. There are many opportunities in food systems work to merge different knowledge systems and call out and nurture webs of relationships. Taking learnings from this conversation forward could include integrating more-than-human power into institutional practices. Examples offered included ceremony and giving thanks, aligning with seasonal and more-than-human rhythms, and reworking Institutional Review Board (IRB) and Research Ethics Board (REB) protocols to move us away from human exceptionalism.

Indigenous food sovereignty can also be pursued through leveraging the privilege and power of university research, teaching, and action to advance Indigenous self-determination. Leveraging includes research and teaching practice led by or pursued in collaboration with Indigenous peoples, and also returning stolen lands (i.e., Land Back). In addition to supporting Indigenous individuals in this work, it is equally important to support Indigenous organizations involved in food- and/or land-related work such as the First Nations Technical Institute, the NDN Collective, and the Traditional Native American Farmers' Association. In all of these examples, the speakers called for pursuing practices that sustain life into the future.

The conversation presented here focused on

the meaning of food sovereignty rooted in relationships, respect, and reciprocity, reconciling different ways of knowing, and interrogating meanings and systems of power. When asked how to take these learnings forward, Keith told a story that he heard from an instructor from a Puebloan community in New Mexico, at a training supported by the Traditional Native American Farmers' Association:

Sometimes when he's out in the woods behind his community, he's out there looking around at stuff in the bush and one time he came upon this patch of some medicinal plant and just based on the way that this was sort of situated, and the level of abundance and the state of the soil around the patch, he could tell that it was anthropogenic, like a person had created it and it was probably one of his ancestors. And he said as soon as he saw that, he imagined his great-great-grandfather up in the sky world looking down with a big smile on his face saying, "Oh, I'm so glad you finally found them. I put them there for you." And for him, having that thought when he's out in the bush and looking at these relatives, with great tenderness and passion, one of his ancestors that can put there for him and his descendants to find. It made him think about how he can be a good ancestor, for the people that are coming next. We need to ask ourselves: What are we leaving behind? How can we be good ancestors, and not just the ancestors to our direct lineage but to others' lineages and the lineages of plants and animals and insects and fungi that share this earth?

Suzanne also added her suggestions: "Plant. Just plant whatever. Create edible landscaping. Encourage life."

The session, and this paper, closed with a Thanksgiving Address from Suzanne that emphasizes the human-environment families that sustain life.

When we came together, we brought our minds together and gave thanks. So now we'll unbraided those minds and acknowledge all those elements in creation to send us on our way and nurture us as human beings. We bring our minds together and we'll give thanks for the human beings and that we return to our families and loved ones in a good way and that they are healthy.

And we turn our minds and give thanks to the Earth, to the plants upon the Earth, the water that flows, fish within those waters, and to the animals that are roaming upon this Earth. And we bring our minds together and give thanks for those elements in creation and give thanks to the trees, to the birds that sing. And we move up into the higher levels of this world, into the four winds that bring the seasons and to our grandmother the moon that rises, to the eldest brother the sun that rises, and to those stars which we refer to as cousins, and to the grandfathers the thunders that come and bring those rains. We give our greatest gratitude and greatest thanks to those elements and now our minds are one.

And then we turn our minds, and we give thanks to the four beings that they say are with us at all times, to help guide us as humans and to the creator that gives us that breath of life. And for all of these we give our greatest greetings and thanks and now our minds are one. And now as we travel back to the things that we are doing, we hope that everyone carries a good mind and carries peace, and that we allow for that continuance of life in this world.

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References

- Agarwal, B. (2014). Food sovereignty, food security and democratic choice: Critical contradictions, difficult conciliations. *The Journal of Peasant Studies*, 41(6), 1247–1268. <https://doi.org/10.1080/03066150.2013.876996>
- Akwesasne Notes (Ed.). (2005). Basic call to consciousness. Native Voices. <https://nativevoicesbooks.com/content/basic-call-consciousness>
- Antone, R. (2013). *Yukwalibowanabtu yukwanosaunee tsiniyukwalibo:t^ As people of the Longhouse, we honor our way of life teka^hsal^ tsiniyukwalibo:t^ praise our way of life* [Doctoral dissertation, The University at Buffalo, State University of New York]. ProQuest Dissertations Publishing. <https://www.proquest.com/openview/8af104b852eb1a8a6d2de286679c6e5f/1.pdf?pq-origsite=gscholar&cbl=18750>
- Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-Eyed Seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331–340. <http://doi.org/10.1007/s13412-012-0086-8>
- Baugh, T. G., & Ericson, J. E. (Eds.). (2013). *Prehistoric exchange systems in North America*. Plenum Press.
- Block, D. R., Chávez, N., Allen, E., & Ramirez, D. (2012). Food sovereignty, urban food access, and food activism: Contemplating the connections through examples from Chicago. *Agriculture and Human Values*, 29(2), 203–215. <https://doi.org/10.1007/s10460-011-9336-8>
- Chaifetz, A., & Jagger, P. (2014). 40 Years of dialogue on food sovereignty: A review and a look ahead. *Global Food Security*, 3(2), 85–91. <https://doi.org/10.1016/j.gfs.2014.04.002>
- Coté, C. (2016). “Indigenizing” food sovereignty. Revitalizing Indigenous food practices and ecological knowledges in Canada and the United States. *Humanities*, 5(3), 57. <https://doi.org/10.3390/h5030057>
- Cowell, A. (2018). *Naming the world: Language and power among the Northern Arapaho*. University of Arizona Press. <https://doi.org/10.2307/j.ctv550ctc>
- Daigle, M. (2019). Tracing the terrain of Indigenous food sovereignties. *The Journal of Peasant Studies*, 46(2), 297–315. <https://doi.org/10.1080/03066150.2017.1324423>
- Daschuk, J. W. (2013). *Clearing the plains: Disease, politics of starvation, and the loss of Aboriginal life*. University of Regina Press.

- de Wit, M. M., Shattuck, A., Iles, A., Graddy-Lovelace, G., Roman-Alcalá, A., & Chappell, M. J. (2021). Operating principles for collective scholar-activism: Early insights from the Agroecology Research-Action Collective. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 319–337. <https://doi.org/10.5304/jafscd.2021.102.022>
- Declaration of Nyéléni. (2007). <https://nyeleni.org/IMG/pdf/DeclNyeleni-en.pdf>
- Desmarais, A. A. (2007). *The Via Campesina: Globalization and the power of peasants*. Fernwood Press.
- Desmarais, A., & Wittman, H. (2014). Farmers, foodies and First Nations: Getting to food sovereignty in Canada. *The Journal of Peasant Studies*, 41(6), 1153–1173. <https://doi.org/10.1080/03066150.2013.876623>
- Edelman, M., Weis, T., Bavisar, A., Borras, S. M., Holt-Giménez, E., Kandiyoti, D., & Wolford, W. (2014). Introduction: Critical perspectives on food sovereignty. *The Journal of Peasant Studies*, 41(6), 911–931. <https://doi.org/10.1080/03066150.2014.963568>
- Fairbairn, M. (2012). Framing transformation: The counter-hegemonic potential of food sovereignty in the US context. *Agriculture and Human Values*, 29(2), 217–230. <https://doi.org/10.1007/s10460-011-9334-x>
- Fritz, G. (2022). Native American agriculture before European contact. In R. D. Hurt (Ed.), *A companion to American agricultural history* (pp. 5–22). John Wiley & Sons. <https://doi.org/10.1002/9781119632214.ch1>
- Grey, S., & Newman, L. (2018). Beyond culinary colonialism: Indigenous food sovereignty, liberal multiculturalism, and the control of gastronomic capital. *Agriculture and Human Values*, 35(3), 717–730. <https://doi.org/10.1007/s10460-018-9868-2>
- Grey, S., & Patel, R. (2015). Food sovereignty as decolonization: Some contributions from Indigenous movements to food system and development politics. *Agriculture and Human Values*, 32(3), 431–444. <https://doi.org/10.1007/s10460-014-9548-9>
- Hammelman, C., Levkoe C. Z., Agyeman, J., Kharod, S., Moragues-Faus, A., Munoz, E., Oliva, J., & Wilson, A. (2020). Integrated food systems governance: Scaling equitable and transformative food projects through activist-scholar engagement. *Journal of Agriculture, Food Systems, and Community Development*, 9(2), 71–86. <https://doi.org/10.5304/jafscd.2020.092.003>
- Hill, R. (2013). *Two row history: Talking points on history and meaning of the Two Row Wampum Belt*. Two Row Wampum Renewal Campaign. <http://honorthetworow.org/wp-content/uploads/2013/03/TwoRowTalkingPoints-Rick-Hill.pdf>
- Holt Giménez, E., & Shattuck, A. (2011). Food crises, food regimes and food movements: Rumbblings of reform or tides of transformation? *The Journal of Peasant Studies*, 38(1), 109–144. <https://doi.org/10.1080/03066150.2010.538578>
- Kamal, A. G., Linklater, R., Thompson, S., Dipple, J., & Ithinto Mechisowin Committee. (2015). A recipe for change: Reclamation of Indigenous food sovereignty in O-Pipon-Na-Piwin Cree Nation for decolonization, resource sharing, and cultural restoration. *Globalizations*, 12(4), 559–575. <https://doi.org/10.1080/14747731.2015.1039761>
- Kepkiewicz, L., & Rotz, S. (2018). Toward anti-colonial food policy in Canada?: (Im)possibilities within the settler state. *Canadian Food Studies/La Revue canadienne des études sur l'alimentation*, 5(2), 13–24. <https://doi.org/10.15353/cfs-rcea.v5i2.202>
- Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants*. Milkweed Editions.
- Klassen, S., Medland, L., Nicol, P., & Pitt, H. (2022). Pathways for advancing good work in food systems: Reflecting on the Good Work for Good Food International Forum. *Journal of Agriculture, Food Systems, and Community Development*, 12(2), 249–265. <https://doi.org/10.5304/jafscd.2023.122.004>
- Levkoe C. Z., Hammelman, C., Craven, L., Farbman, J., Harrison, J., & Mount P. (2018). Building sustainable communities through food hubs: Practitioner and academic perspectives. *Journal of Agriculture, Food Systems, and Community Development*, 8(2), 107–122. <https://doi.org/10.5304/jafscd.2018.082.008>
- Levkoe, C. Z., Lowitt, K., & Nelson, C. (2017). “Fish as food”: Exploring a food sovereignty approach to small-scale fisheries. *Marine Policy*, 85, 65–70. <https://doi.org/10.1016/j.marpol.2017.08.018>
- Levkoe, C. Z., McClintock, N., Minkoff-Zern, L., Coplen, A. K., Gaddis, J., Lo, J., Tendick-Matesanz, F., & Weiler, A. (2016). Forging links between food chain labor activists and academics. *Journal of Agriculture, Food Systems, and Community Development*, 6(2), 129–142. <https://doi.org/10.5304/jafscd.2016.062.009>

- Levkoe, C. Z., Ray, L., & McLaughlin, J. (2019). The Indigenous Food Circle: Reconciliation and resurgence through food in northwestern Ontario. *Journal of Agriculture, Food Systems, and Community Development*, 9(Suppl. 2), 101–114. <https://doi.org/10.5304/jafscd.2019.09B.008>
- Martens, T., Cidro, J., Hart, M. A., & McLachlan, S. (2016). Understanding Indigenous food sovereignty through an Indigenous research paradigm. *Journal of Indigenous Social Development*, 5(1), 18–37. <https://journalhosting.ucalgary.ca/index.php/jisd/article/view/58469>
- Mihesuah, D. A., & Hoover, E. (Eds.). (2019). *Indigenous food sovereignty in the United States: Restoring cultural knowledge, protecting environments, and regaining health*. University of Oklahoma Press.
- Morrison, D. (2011). Indigenous food sovereignty: A model for social learning. In H. Witman, A. A. Desmarais, & N. Wiebe (Eds.), *Food sovereignty in Canada: Creating just and sustainable food systems* (pp. 97–113). Fernwood Press.
- Murphy, J., Rhodes, M. L., Meek, J. W., & Denyer, D. (2017). Managing the entanglement: Complexity leadership in public sector systems. *Public Administration Review*, 77(5), 692–704. <https://doi.org/10.1111/puar.12698>
- Nash, M. A. (2019). Entangled pasts: Land-grant colleges and American Indian dispossession. *History of Education Quarterly*, 59(4), 437–467. <https://doi.org/10.1017/heq.2019.31>
- Parmenter, J. (2013). The meaning of *Kaswentha* and the Two Row Wampum Belt in Haudenosaunee (Iroquois) history: Can Indigenous oral tradition be reconciled with the documentary record? *Journal of Early American History*, 3(1), 82–109. <https://doi.org/10.1163/18770703-00301005>
- Patel, R. (2009). Food sovereignty. *The Journal of Peasant Studies*, 36(3), 663–706. <https://doi.org/10.1080/03066150903143079>
- Ransom, J. W., & Ettenger, K. T. (2001). ‘Polishing the Kaswentha’: A Haudenosaunee view of environmental cooperation. *Environmental Science & Policy*, 4(4–5), 219–228. [https://doi.org/10.1016/S1462-9011\(01\)00027-2](https://doi.org/10.1016/S1462-9011(01)00027-2)
- Ray, L., Burnett, K., Cameron, A., Joseph, S., LeBlanc, J., Parker, B., Recollet, A., & Sergerie, C. (2019). Examining Indigenous food sovereignty as a conceptual framework for health in two urban communities in Northern Ontario, Canada. *Global Health Promotion*, 26(3, Suppl.), 54–63. <https://doi.org/10.1177/1757975919831>
- Rice, A. M., & Goldberg, Z. A. (2021). ‘Harvesting a participatory movement’: Initial participatory action research with the Jewish Farmer Network. *Journal of Agriculture, Food Systems, and Community Development*, 11(1), 115–136. <https://doi.org/10.5304/jafscd.2021.111.010>
- Robidoux, M. A., & Mason, C. W. (Eds.). (2017). *A land not forgotten: Indigenous food security and land-based practices in Northern Ontario*. University of Manitoba Press.
- Robin, T. (2019). Our hands at work: Indigenous food sovereignty in western Canada. *Journal of Agriculture, Food Systems, and Community Development*, 9(Suppl. 2), 85–99. <https://doi.org/10.5304/jafscd.2019.09B.007>
- Ruelle, M. L. (2017). Ecological relations and Indigenous food sovereignty in Standing Rock. *American Indian Culture and Research Journal*, 41(3), 113–125. <https://doi.org/10.17953/aicrj.41.3.ruelle>
- Settee, P., & Shukla, S. (Eds.). (2020). *Indigenous food systems: Concepts, cases, and conversations*. Canadian Scholars Press.
- Whyte, K. P. (2016). Indigenous food sovereignty, renewal and US settler colonialism. In M. Rawlinson & C. Ward (Eds.), *The Routledge Handbook of Food Ethics* (pp. 354–365). Routledge.
- Wittman, H. (2011). Food sovereignty: A new rights framework for food and nature? *Environment and Society*, 2(1), 87–105. <https://doi.org/10.3167/ares.2011.020106>
- Wittman, H., Desmarais, A., & Wiebe, N. (Eds.). (2010). *Food sovereignty: Reconnecting food, nature and community*. Food First.
- Yellowhead Institute. (2019) *Land Back: A Yellowhead Institute Red Paper*. <https://redpaper.yellowheadinstitute.org/wp-content/uploads/2019/10/red-paper-report-final.pdf>

Food systems change and the alternative campus foodscape

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Abstract

Postsecondary students, staff, and faculty across North America are actively involved in transforming food systems on campuses and beyond. Much of the scholarship documenting these inroads has focused on procurement, production, and pedagogy. While this work is essential, it paints an incomplete picture of the ways postsecondary campuses—and students in particular—are contributing to realizing more just and sustainable food systems. In this paper, we elaborate the

contours of what we propose as the *alternative* campus foodscape in Canada by highlighting campus food systems alternatives (CFSAs), which we define as on-campus initiatives that are motivated by animating structural, practice, and/or policy change through the campus foodscape. We demonstrate how CFSAs are distinct from conventional food systems and argue that they are essential elements of a robust movement for food systems transformation.

Keywords

Campus Food Systems, Alternative Campus Food Systems, Local Food Systems, Student Movements, Higher Education, Food Systems Pedagogy

Abbreviations

CFGS: Campus food growing space
CFSA: Campus food systems alternative
CFSS: Campus food serving space

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Introduction

The impact (real and potential) of college and university campuses in the context of broader food systems change has become an increasingly popular scholarly focus. Much of this work can be categorized into one of three categories: alternative forms of *procurement* (Bohunicky et al., 2019; Martin & Andrée, 2012; Stahlbrand, 2019); alternative forms of campus food *production* (Angstmann et al., 2019; Gardener, 2012; Green, 2021; LaCharite, 2016; Parr & Trexler, 2011); or critical food systems *pedagogy* (Anderson et al., 2019; Sumner, 2016; Valley et al., 2018). In aggregate, this growing body of scholarship and practice constitutes a “campus turn” in food systems scholarship and practice. The contributions of college and university campuses, and their actors and initiatives, are being taken increasingly seriously in the broader context of movements for socio-ecological food systems change. The idea of the campus foodscape is useful in conceptualizing the numerous elements that enable and constrain food systems transformation in the campus environment. Fanshel and Iles (2022) define campus foodscapes as “entities that make up food-related learning and practice, encompassing (but not limited to) teaching, research, student organizations, activism, administrative decisions and initiatives, support services, campus gardens, dining services, eateries, and other procurement” (p. 3).

The campus turn in food systems scholarship and activism has revealed a variety of leverage points in the campus environment that are (or can) effect broader food systems change. So far, very little of this work has focused on existing campus-based food systems alternatives—from farms and gardens to student-run food banks and cooperatively run cafés. There is a rich diversity of campus-based initiatives that form an integral part of the pedagogy, practice, and politics of the broader movement for food systems transformation. While there has been some interest in campus farms (see, for example, Barlett, 2017; LaCharite, 2016; Sayre & Clark, 2011/2022), this provides only a partial glimpse into the ways students, staff, and faculty are actively making or imagining food systems solutions on their campuses and beyond.

The work of alternative production, procure-

ment, and pedagogy is a central element of the cumulative impact of campuses on broader food systems prefiguration and change. However, to appreciate the full transformational potential of campus-based movements, we need a more fulsome accounting and understanding of the types of existing campus food systems alternatives (Classens et al., 2021). To these ends, in this article we attempt to bring production, procurement, and pedagogy together into a shared conceptual model that is inclusive of, and goes beyond, this foundational work. Our intention is to lay important analytic groundwork that reveals conceptual linkages between seemingly discrete interventions, while situating these interventions within broader food systems dynamics.

To be clear, the stakes for food systems transformation could not be higher. The colliding impacts of climate change, corporate concentration, and geopolitical instability have deepened the longstanding social inequity and ecological unsustainability of the capital-intensive industrialized food system. Without concerted and immediate action to relocalize, diversify, and decommodify food systems, we are “sleepwalking into the catastrophic and systematic food crises of the future” (International Panel of Experts on Sustainable Food Systems, 2022, p. 2). In response to these crises, social movements and civil society organizations have mobilized to develop myriad program, practice, and policy interventions toward the realization of more socially just and ecologically rational food systems. Postsecondary campuses are actively involved in this work, and yet so far have received scant scholarly attention (beyond production, procurement, and pedagogy, as we discuss below). Campuses and campus actors have made significant contributions in the struggles for socio-ecological justice for decades, from anti-war and civil rights campaigns, to anti-apartheid and racial justice movements. Thus, there is perhaps reason to be optimistic about the role they may play in realizing social and ecological justice through food systems transformation.

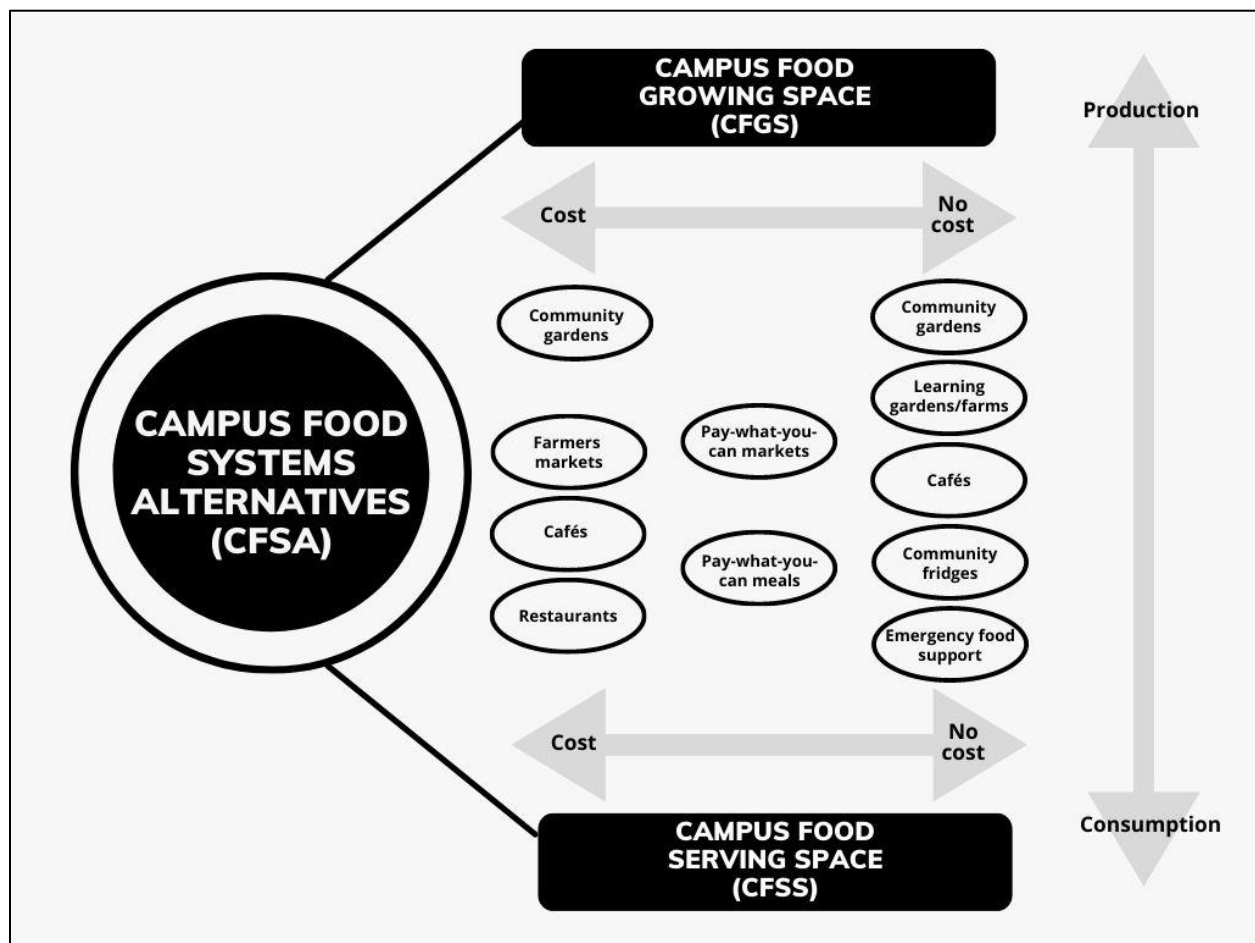
In this paper, we elaborate the contours of what we propose as the *alternative* campus foodscape in Canada, that is, elements and initiatives of the campus that are motivated by animating struc-

tural, practice, and/or policy change through the campus foodscape. We build on work by Classens et al. (2021), who proposed a two-part descriptive analytic of food-focused campus initiatives: campus food system alternatives (CFSAs) and campus food growing space (CFGs). We add to this campus food serving space (CFSS). We propose that the alternative campus foodscape comprises these three elements. CFSA is an overarching category with two constituent parts, CFGS and CFSS (see Figure 1). To develop this more fully, we propose a descriptive typology of each initiative and elaborate on the characteristics of CFSAs that distinguish them from conventional campus food systems, related to (a) governance and leadership and (b) principles and socio-ecological commitments. We ultimately theorize CFSA within the broader context of student/campus movements for socio-

ecological change.

This paper is informed empirically by four principle activities: a systematic scan of postsecondary institution websites for mention of CFGS in Canada ($n=90$), a systematic scan of postsecondary institution websites for mention of CFSS in Canada ($n=55$), a survey of those involved in CFGS to learn more about their experiences ($n=109$), and finally, interviews with students and staff involved in CFSAs ($n=49$). The interview data were coded in NVivo by the first author. All data were further analyzed and interpreted in discussion among all three authors. The work was also informed by ongoing discussions with the Campus Farms Canada network (founded by the first author), composed of students, staff and faculty involved in CFGS across Canada.

Figure 1. Campus Food Systems Alternatives (CFSA) Model



The Campus Climate and Socio-Ecological Change

Young people, and in particular, postsecondary students, have been key actors in nearly every significant social movement since at least the post-war period (Rhoades, 2019). However, the history of student activism goes well beyond this, to the 17th century, when students organized for better curriculum, lodging, and food (Burton, 2007; Moore, 1976). Much more recently, students have continued to mobilize for more equitable and inclusive education policy while waging resistance against the ongoing neoliberalization of higher education (Cole & Heinecke, 2020; Wheatle & Commodore, 2019).

Student activism, however, is not only limited to the campus environment. Coincident with the rise of the New Left, student activism substantively shaped the political and (counter)cultural project of the 1960s and 1970s. The campus environment more generally was intertwined with the radical politics of the era, including that of the Chicana/o Movement, the Black Power Movement, and the Students for Democratic Society, among others (Broadhurst & Velez, 2019). In other words, student activism has a long precedent of being significantly oriented beyond campus, aimed at addressing and responding to a range of social, political, economic, and environmental issues in wider society (Astin et al, 1975; Linder et al., 2019).

In the North American context, student activists have been central to a wide range of contemporary movements with impact well beyond campus. From #MeToo (Rentschler, 2018), and Black Lives Matter (Hope et al., 2016), through to Queer (Vaccaro & Mena, 2011) and disability activism (Kimball et al., 2016), students are at the forefront of efforts to reshape society. In the international context, meanwhile, students have been instrumental in myriad efforts, including counter-colonial struggles in Kashmir (Pandit, 2019), anti-Extradition Bill movements in Hong Kong (Tong & Yuen, 2021), and online student activism in Zimbabwe (Hove & Dube, 2022).

Students, however, are not the only political actors on campus. While the research is quite thin on the role of “non-student constituent groups” (Agua & Pendakur, 2019, p. 165) in the context of

activism in the campus climate, this work remains instructive. The campus climate is composed of heterogeneous actors in various structural contexts. These contexts can influence the extent to which the actors are able or willing to agitate for change on campus or beyond it. Many college and university staff exist in “a liminal space of political and processional tension” (Agua & Pendakur, 2019, p. 164) given that the privileges afforded to some faculty (with respect to academic freedom and tenure) are not extended to staff and contingent faculty. Student affairs professionals interested in animating change “often walk a tight-rope” (Agua & Pendakur, 2019, p. 164) navigating the socio-political context of the campus climate. Similarly, junior and precariously employed faculty, who make up an increasing percentage of the overall faculty, may feel constrained in their willingness to agitate for structural, policy, or practice change that is seen as bristling against the status quo. Indeed, student activism is often seen as a nuisance by administrators (Bradley, 2015; Joseph, 2003; Rogers, 2012). These dynamics, then, introduce some ambivalence into the broader context of postsecondary campuses as centers of socio-ecological change.

Despite these challenges, the campus climate remains a site of transformation—both real and potential—and one in which food scholars have demonstrated considerable interest. In the context of food systems change, campuses create “spaces of possibility,” according to Goodman et al. (2012, p. 4). With access to considerable financial, material, and intellectual resources, campuses are well positioned to contribute in a variety of ways to more just and sustainable food systems. There is also an inherent kind of resonance with food, particularly among students. As Duncan Hilchey noted in the introduction to a special issue of this journal dedicated to higher education and food systems in 2012,

Food systems has an intrinsic appeal to students, and it offers a powerful lens through which to understand communities, evaluate the human condition, unite behind a common cause—and generally make the world a better place. It is also attractive to a growing cadre of

young faculty who are equipped with the art and skill of interdisciplinary work. (p. 1)

The scholarship focused on capturing the ways that campuses and campus actors pursue food systems change is growing and varied. Immediately below we review some of this scholarship and frame it as attending to a cluster of concerns related to procurement, production, and/or pedagogy. These proposed categories are not mutually exclusive. Indeed, (critical) food systems pedagogy is arguably a feature of most campus-based food systems initiatives (either explicitly or implicitly). Nonetheless, in the remainder of this section, we briefly summarize these three categories as constitutive—though not exhaustive—elements of CFSAs.

Procurement

As large institutions that purchase significant quantities of food, one important way campuses can and do shape food systems is through alternative procurement initiatives. At the moment, food services on most campuses are controlled by a small number of for-profit, transnational corporations, including Compass Group, ARAMARK, and Sodexo (Martin & Andrée, 2012). In some cases, campuses have a blended model of food services operations, partly operated by the institution and partly contracted, although in the aggregate about 70% of food services on campuses in Canada are contracted out (Bohunicky et al., 2019). These companies are notorious for a variety of practices that undermine the pursuit of more just and sustainable food systems, from providing energy-dense, nutrient-poor foods to exerting downward pressure on labor costs (Creed, 2001; Martin & Andrée, 2012). As Bohunicky et al. (2019) put it, the “big three” corporate food service providers “are the primary expression of the globalized, corporate, industrial, and neoliberal food system on campuses today” (p. 33).

It is important to note that many students are effectively forced to use the campus foodscape as their primary site of food consumption due either to the isolated nature of campuses, the requirement to buy a meal plan, or both. These issues can be compounded for students who live in residence

halls and do not have access to kitchens to cook their own food (Classens & Systma, 2020). Classens and Systma note that “the lack of supportive amenities on campus channels students to the fast-food offerings, likely reinforcing the corporate food paradigm and contributing to food deskilling and food illiteracy” (p. 12). While post-secondary student food insecurity is relatively under-researched and not well understood, we know that students experience far higher rates of food insecurity than the general population (Bruening et al., 2017; Maynard et al., 2018; Nazim et al., 2019). Recent work in Canada suggests that upwards of 40% of postsecondary students experience food insecurity (Maynard et al., 2018). A survey conducted in the midst of COVID-19 found that a staggering 56.8% of postsecondary students experienced food insecurity in the fall of 2021 (Meal Exchange, 2021).

Alternative procurement models on campuses seek to address some of these issues while altering the socio-ecological relations of food systems, through, for example, direct purchasing arrangements, in ways that support more just and sustainable production-consumption dynamics (Attfield, 2014; Lyson, 2004; Peters, 2015; Stahlbrand, 2019). Barlett (2017) suggested that alternative procurement initiatives are an “on-ramp” (p. 189) for campuses motivated to move toward a more just and sustainable food system. This can take a variety of approaches, from “a focus on a particular product (local apples), issue (sustainable seafood), or event (100-mile meal),” and alternative procurement initiatives ultimately constitute “a ‘do something’ approach that begins the conversation towards more substantive purchasing shifts” (Barlett, 2017, p. 189).

While we recognize the limitations of consumption-side, so-called consumer activism, the efforts of the many scholars and activists agitating for more socially just and ecologically rational food services procurement models should not be overlooked. As Bohunicky et al. (2019) argue, “food system transformation can best occur by moving away from corporate food service contracts” (p. 44). This remains much easier said than done. Stahlbrand (2019), for example, wrote about her efforts to integrate more socially and environmen-

tally sustainable practices into food services at the University of Toronto through Local Food Plus, a nonprofit organization she founded. Chef/activist Joshna Maharaj (2020) recounted her efforts as assistant director of food services and executive chef at Toronto Metropolitan University (then Ryerson University) to transform that institution's food system in response to significant pressure from students. Both of these projects, while successful for a time, ultimately failed to be long-term, transformational projects. However, the impacts they had—however temporary—on supporting local food production, developing local foodways, and providing students with increased access to fresh, healthy food cannot be discounted.

Production

The Morrill Land Grant College Act, originally enacted in 1862, established the land-grant university system in the United States. The act was a central piece of the federal government's plan to encourage postsecondary institutions to "teach such branches of learning as are related to agriculture and the mechanic arts" (Morrill Land Grant College Act, as quoted in Sayre, 2011/2022, p. 6). Over the course of the past century and a half, postsecondary farms enabled through the Morrill Land Grant College Act have supported practical teaching and research in support, largely, of corporate industrial agriculture (LaCharite, 2016).

In more recent years, there has been rapid growth in campus food-growing outside of the land-grant model using what we refer to as Campus Food Growing Spaces (CFGs; Classens et al., 2021). In the U.S., the number of CFGs increased from 23 in 1992 to 300 in 2016 (LaCharite, 2016). In Canada, meanwhile, there are upwards of 100 campuses with some kind of food-growing space (see the tables in the Appendix). Importantly, most of the farms that have emerged in the last two decades or so represent a paradigmatic departure from that of the land-grant farms (Barlett, 2011; Classens & Burton, 2022; LaCharite, 2016). This criticism has been long-brewing. Over 40 years ago, Mayer and Mayer (1974) were highly critical of the disciplinarily bounded, narrowly conceived paradigm of the land-grant system. They wrote,

The present isolation of agriculture in American academic life is a tragedy. Not only does it deprive us of the most useful models of the systems approach to human affairs, but it puts us—and the world—in mortal peril. (Mayer & Mayer, 1974, p. 83)

Many CFGs today are not animated by desires to support the conventional food system but rather exist explicitly to challenge it. Scholars have noted that there is a great diversity in these spaces, but that they share the common purpose of animating food systems and broader socio-ecological change.

Scholars have focused on a variety of impacts of CFGs, from their role in sustainability education and farmer training to their interdisciplinarity and their facilitation of student leadership and sense of social responsibility (Angstmann et al., 2019; Gardener, 2012; Green, 2021; LaCharite, 2016; Parr & Trexler, 2011). CFGs, in other words, have impacts quite different from the land-grant model's positivist and productivist commitments to yield increase and the like. Eatmon and colleagues (2015) have referred to CFGs as "integrating contexts" within which complex food systems issues (and the socio-ecological dynamics that compose them) can be struggled with and attended to.

Importantly, the impact of CFGs extends beyond campus. Angstmann et al. (2019) noted that CFGs help students understand their "civic role and its impact to broader society" (Theoretical Foundation section, para. 1) through action-focused and experiential education. Aftandilian and Dart (2013) demonstrated how service-learning in CFGs empowers students to engage with social change and translate their initiative, skills, and service in the garden toward the pursuit of socio-ecological change beyond campus. Barlett (2011) underscored this point, observing that CFGs are "insulated spaces for the growth of new nodes, actors and institutions in the food chain" (p. 103).

Sayre (2011/2022) notes that nearly 50 years later, Mayer and Mayer's 1974 perspective on the land-grant model is deeply prescient:

a powerful indictment of the disciplinary and cultural divisions that were increasingly coming to isolate food producers from the wider food-

consuming public, simultaneously obscuring the political processes affecting the food system on both the global and the local level. (p. 10)

It is worth noting that while many land-grant institutions and conventional faculties and departments of agriculture generally underpin the dominant food system, there are of course exceptions. Additionally, no institution is a monolith; there are internal tensions, differentiations, and dissonances. For example, Michigan State University, a pioneering land-grant university on which many others were modeled, is home to the Center for Regional Food Systems, an innovative hub of action-research committed to equitable and sustainable food systems (Michigan State University Center for Regional Food Systems, n.d.). Similarly, the University of California, Berkeley, another land-grant university, is at the forefront of critical food systems pedagogy work (see, for example, Fanshel & Iles, 2020, 2022). These, and others, are hopeful examples and gesture at the possibility for allyship with and among institutions and units historically supportive of conventional agri-food systems.

Pedagogy

Until relatively recently, food pedagogy as an area of formal study was unappreciated. As Sumner concisely put it not so long ago, “those who study learning have not often turned their gaze toward food, while those who study food have generally overlooked the learning associated with it” (2016, p. xix). As scholars have begun to turn a critical eye on food systems pedagogy, many have found the associated teaching and learning as it exists, on the whole, to be somewhat problematic. Jordan et al. (2014) found that conventional learning about food systems is relatively narrow in scope, unduly beholden to disciplinary boundaries, and abstracted from the broader economic, cultural, political, and ecological contexts that shape food systems in the first place. Valley and colleagues concurred, adding, “Traditional agriculture and food-related curricula often follow linear, cause-and-effect rationalities that focus on a limited range of objectives (e.g., agricultural yield, micronutrient intake, or return on investment)” (2018, p. 468).

In contrast to this conventional perspective, Meek and Tarlau (2016) insisted that food systems educators are confronted with an explicitly political choice to “use education to reproduce the current food system, raise awareness about the inequities of the food system, or *utilize education as a means to form individuals who are determined to transform the food system*” (p. 246, emphasis added). Jennifer Sumner (2016) referred to this as *critical* food systems pedagogy, which is made up of “a range of approaches that are not just concerned with any type of change but with change that addresses power and injustice” (p. xix). This paradigm of food systems pedagogy embraces the inherent complexity and interdisciplinarity of food systems while reckoning with the structural conditions that perpetuate food systems inequities (see also Flowers & Swan, 2012; Meek & Tarlau, 2016; Sumner, 2016; Valley et al., 2018).

Not surprisingly, praxis is proposed as a key component of a critically oriented food systems pedagogy (see, for example, Meek and Tarlau, 2016). This perspective emphasizes teaching and learning in experiential and action-focused ways to affect food systems change on campus and beyond. As Fanshel and Iles (2022) noted, “universities and colleges are fertile foodscapes of action-based education” (p. 1). Eatmon et al. (2016), for example, have written that on-campus food production is well suited to interdisciplinary, change-focused pedagogy (see also Eatmon et al., 2015). Burley and colleagues (2016) demonstrated how undergraduate and graduate students collaborated in a seminar course to support local and sustainably sourced food procurement on campus. Many others, as summarized above, have noted the formal and informal learning opportunities of campus farms (Classens et al., 2021; LaCharite, 2016; Sayre & Clark, 2011/2022). In many other cases, food systems teaching and learning on campus is deployed to effect change beyond it. As an example, Levkoe et al. (2019) highlighted a collaboration between students, faculty, and community practitioners within the context of a community service learning project.

In sum, procurement, production, and pedagogy can be understood as the three sturdy pillars of the campus turn in food systems scholarship

and activism. These three interventions, and the intersections between them, provide fertile ground for students, staff, and faculty to mobilize in the context of food systems transformation. While these elements are essential to the composition of the alternative campus foodscape, they do not constitute an exhaustive accounting of it. In the next section, we provide more elaboration of the alternative campus foodscape as composed of CFSAs, CFGS, and CFSS.

The Alternative Campus Foodscape

In this section, we begin by building on the CFSA schematic proposed by Classens et al. (2021) by providing a brief overview of the initiative type and proposing CFSS as a complementary piece of the CFSA analytic. Next, we elaborate on some of the shared characteristics of the initiatives that compose CFSAs. We categorize these shared characteristics into two elements: (a) governance and leadership and (b) principles and socio-ecological commitments.

The initial conceptual framing of CFSA proposed by Classens et al. (2021) was centrally informed by the notion of informal learning on campus. Classens et al. noted that scholars have pointed to a range of on-campus spaces in which informal learning about food occurs, from wellness centers (Mirwaldt, 2010) and residences (Vetere, 2010) through to campus gardens (LaCharite, 2016) and dining halls (Roberts-Stahlbrand, 2020). This research, while essential to providing glimpses into the alternative campus foodscape, ultimately provides only a partial perspective. The CFSA analytic is intended to provide some conceptual coherence between discrete spaces and initiatives on campus “to theorize the moments all along the campus food system, from production through to disposal” (Classens et al., 2021, p. 3). Classens et al. use a food systems lens “to enable a broader focus in order to highlight the prefigurative and informal pedagogical value throughout the (alternative) campus food chain” (p. 3).

Figure 1 provides an overview of our proposed CFSA model. We understand CFSA as an overarching category meant to capture elements and initiatives that are motivated by animating structural, practice, and/or policy change through the

campus foodscape. This is further differentiated along the production-consumption and cost–no cost spectrums. We emphasize cost–no cost in our model to reflect the extent to which CFSAs are motivated by the desire to increase access to affordable (or free) culturally appropriate, sustainably produced food to students, a disproportionately food-insecure population. In most cases, initiatives we would classify on the cost end of the spectrum are heavily subsidized, providing students access to affordable food and/or food-growing opportunities. Of the over 100 CFSAs we identify (see Figure 2), none is primarily motivated by profit, and the vast majority operate nonprofit models. Our focus on production-consumption dynamics is informed by food systems thinking. We acknowledge that food disposal is not explicitly captured in our model; this represents an area for future research. However, organizations such as MealCare, a national organization with chapters at eight campuses across Canada, divert food waste into emergency food provision streams on campus. We would classify these as no-cost emergency food support within the logic of our model. Finally, we understand pedagogy, either formal or informal, as diffused throughout the model.

Space does not permit a full elaboration of each initiative type. In any case, the variability between initiatives, even those of the same type, complicates the prospect of proposing an archetypal description. As with any conceptual model, the one we propose has limitations. For example, it is worth noting that some CFSAs, such as the University of British Columbia Farm, are in fact made of several discrete initiatives within a shared physical space (in this case, a market garden, an Indigenous garden, and a weekly market, among others). In cases such as this, there is typically still a shared vision and guiding principles within which sub-initiatives must operate (see, for example, UBC Farm, n.d.). Additionally, our model does not reflect the evolution of CFSAs over time in terms of focus, governance, composition, and the like. As discussed in the conclusion, longitudinal, ethnographic, and place-based research will help to refine our proposed model over time. Notwithstanding these limitations, immediately below we propose shared characteristics of CFSAs in an

attempt to better differentiate them from the conventional (campus) food system. We group these elements into two broad categories: governance and leadership, and principles and socio-ecological commitments.

Governance and Leadership

In contrast to conventional campus food systems, CFSAs are substantively governed by students. In practice, CFSAs include a range of models that provide students with more or less autonomy over decision-making, from a more limited managerial role to full autonomy and decision-making authority. In some cases, this governance role is the result of aspects of an initiative being integrated into the formal operations of the host institution or a specific program or department (for example, through a work study or independent study course). In many cases, student organizers work completely independently of the university's formal structures.

In our survey of those involved with CFGS, 43% of respondents indicated that they had some say over the governance and decision-making of the initiative with which they were involved. Nearly all of the leaders in the CFSS we interviewed noted that their initiatives were student-run.¹ Students (in both the survey and interviews) mentioned a variety of opportunities to help plan and advise the high-level operation of their CFSAs, such as determining the core mission and vision of the initiative, determining desired learning objectives for students, assisting with business models to grow the space, and updating policies regarding COVID-19 safety protocols, among others. Students also inform more tactical decision-making related to a variety of issues, from what to plant in a CFGS, through to what to include on the menu at a CFSS. This engagement—both in quantity and quality—is an important impact of CFSAs on students' experiential learning.

Governance structures vary significantly across CFSAs. Typically, in larger CFGSs, decision-making bodies are composed of staff and faculty,

with students having a lesser role in strategic decisions. This is the case, for example, at the Trent Farm and the University of British Columbia Farm. In other cases, higher-order student bodies (for example, a student's union) provide strategic oversight, and the CFSAs operate as an initiative under this umbrella. The Student Union Pantry at the University of Regina and the Food Collective Centre at McMaster University, for example, operate in such a blended governance (and funding) model. Many CFSAs operate as collectives or co-ops and employ collaborative, nonhierarchical decision-making structures. The BIPOC Growing Collective at Trent University employs collective decision-making, as does the Loaded Ladle at Dalhousie University, which lists "open non-hierarchical decision making" as one of their core values (Loaded Ladle, 2022, para. 1).

Similarly, CFSAs are supported by a range of funding arrangements. In some cases, CFSAs receive funding directly through the administrative infrastructure of the postsecondary institution (for example, through an office of sustainability or central food services). Much more commonly, however, CFSAs are funded through a student levy fee that is either paid directly to the initiative or funneled through a higher-order student body (such as a student union). Many initiatives also rely on donations and fundraising campaigns. Still others adopt a social-enterprise model in which they fund their operations through sales of fresh produce, prepared meals, or branded materials such as reusable bags and t-shirts. Perhaps not surprisingly, there is significant variation in levels of financial stability among CFSAs. While some struggle to remain in operation through a patchwork of very small funding sources and volunteer labor, others (particularly those with support from their host institution) are very well and stably funded.

Principles and Socio-Ecological Commitments

A defining feature of CFSAs, one that distinguishes them from the conventional elements of food ser-

¹ We speculate that the lower level of student leadership in CFGSs relative to CFSSs might be a function of land access and tenure. CFGSs, in particular those that are quite large, require land resources, representing a de facto (and in many cases, significant) investment on behalf of the university. Many CFSSs, on the other hand, do not require such a significant investment from their host institution, and as a result, may experience more autonomy.

vices and agricultural education and reveals the transformative action and potential of these initiatives, are the principles and socio-ecological commitments they espouse. We do not mean to suggest that there is uniformity across all CFSAs. However, on the whole, CFSAs are notable in that their work is animated through explicit normative commitments to concerns beyond those typically associated with conventional food service or campus farm operations (i.e., maximization of profit or yield). These features cast in high relief how CFSAs agitate for systems change within and through food systems on campus and beyond. The following section will outline some of the principles and socio-ecological commitments espoused by CFSAs across the country.

Not surprisingly, student leadership in CFSAs results in the initiatives prioritizing student concerns. A student leader at the University of Calgary remarked that they want to communicate with the student body about food issues and then work to address these issues, because this is something that traditional food retail franchises on campus do not often do. Another student leader at McMaster University noted:

We are connected to students, we understand, especially the undergraduate student life-style. . . . The adults I talked to in, like, hospitality services or facility services on campus, they are not always as in tune with what it's like to be a student and what things students might need.

Another student leader at the Soup Bar at Humber College insisted, "We advocate on behalf of students. . . . We make sure that we amplify their voice to the institution. . . . We want to make sure that we're student-centric."

Given the prevalence and depth of student food insecurity on campuses, it is not surprising that many CFSAs prioritize equitable and dignified food access. Embedded in this tactical intervention is a criticism of corporate food service providers that prioritize profit over access. In the corporate model, affordability, variety, the availability of healthy and fresh options, and access to culturally appropriate foods are all squeezed through the

logic of corporate profit (Bohunicky et al., 2019; Martin & Andr  e, 2012). Student leaders on campus imagine, and prefigure, different kinds of food systems predicated on values beyond profit. A student leader involved in a CFGS at Trent University shared:

I am involved in meetings to determine goals and planning for the next season. I am part of seed selection and selection of food to be grown based on previous years' successes and advice from previous managers. Part of the planning for this year will be focused on bringing a market to the university to combat food insecurity, selling food at affordable prices for students, and figuring out subsidy options.

Part and parcel of increasing food access and supporting student food security for many CFSAs is the notion of community-building through food. Many CFSS leaders emphasized that they prioritized building safe and inclusive spaces for students. A leader with a campus food bank said that their efforts were animated by their desire to provide "food to the most in need without providing them shame or stigma." A leader with another CFSS reflected on their efforts to offer "a non-intimidating space, a space created by students, for students." A leader with the McEown Community Garden at the University of Saskatchewan reflected on their efforts to create a welcoming space, particularly for newcomer students:

The beauty of this garden is it's located literally right outside the front door of many of our residence buildings, so it's typically on their [students'] commute to and from campus. . . . It's a lot of what I've already mentioned, just providing opportunities for community-building, interaction, getting to know one another, especially because a lot of people who decide to garden are international students who know next to nobody when they moved to the country or move to the city.

A leader with The People's Potato, a collectively run, pay-what-you-can soup kitchen at Con-

cordia University, insisted that community-building was one of their greatest strengths:

Everyone goes there feeling that in some way it's their space [which] is the strongest thing, . . . and the fact that they can feel like they're contributing because they're not just going there to eat, . . . they can go there and they [can] actually help make the food. And then the next day, [they can] come back and just eat, they don't have to come in and help but it's just feeling like they're a part of something.

Similarly, a coordinator with the Trent Vegetable Garden (TVG) reflected:

I would say the greatest strength is the community that we've been able to cultivate, and the energy and love and effort and blood and sweat that that community puts into this space. It's certainly not just me, it's a ton of people coming together to make this space productive, and I don't see that on a traditional or commercial farm. You don't walk into a cafeteria and feel all of those good community feelings.

As this TVG member implies, the kind of community many CFSAs are building models socio-ecological relations that depart dramatically from those favored by the conventional campus food system. Some CFSAs across the country espouse a radical politics premised on anti-colonialism, anti-capitalism, and anti-oppression commitments, and this shapes and determines their food work. Much of this work also challenges the instrumental, productivist commitments of conventional agriculture. For example, a leader with the Brescia University College Community Garden insists that their work allows people to see the connections between people, food, and the land right in front of them, which is important because we are often unaware of these connections. Moreover, the leader at Brescia uses food as a way for people to connect to the land and to one another. One leader with the EMBARK Learning Garden at Simon Fraser University said

that their work is grounded in “justice, equity, decolonization, diversity, and inclusion,” and that these commitments inform “everything that we do.” Across the country, a leader with the BIPOC Growing Collective at Trent University expressed a similar sentiment: “we ground ourselves in abolitionist and decolonizing frameworks rooted in the sacredness of all life, respect, reciprocity, accountability, and mutual aid.”

It is worth noting that not all CFSAs operate within a radical anti-oppression/anti-colonial/anti-capitalist framework, at least not openly. Some CFSA organizers may not share these politics, and others may not be willing to share them publicly for fear of either personal or organizational reprisal. However, what is clear is that a vast majority of CFSAs are motivated by various critiques of the dominant food system.

In many cases, these critiques are animated by commitments to sustainable and regenerative food systems. A leader with the People's Republic of Delicious, a food rescue and redistribution initiative at the University of Ottawa, described their organization's approach to fusing social and environmental justice:

We rescue produce that would have been thrown away by grocery stores or restaurants or food processing plants, and then we serve them up for free to the campus community. . . . What we're interested in is a mixture of social justice and environmental sustainability.

A coordinator with the Simon Farm Project at the University of Calgary explained how they think about regenerative food systems:

Waste is simply a resource you haven't thought about how to capture. . . . We always need to be thinking about how the outputs we create, and the externalities need to be accounted for [so that the] system [can] continually function without eroding its ability to provide services we need from it.

These commitments also clearly resonate with many CFSSs, which prioritize food waste redistri-

bution, organic foods, vegan or vegetarian meals, using local food (often in partnership with a CFGS, when available), using sustainable food packaging, and managing waste more sustainably through composting.

Finally, empowering and engaging students in socio-ecological change is a commitment shared among most CFSAs across the country. In some cases, this involves student leaders sharing knowledge with and building the capacity of other students on campus. For the leaders of DigIn!, a CFGS-coordinating organization at the University of Toronto, this means supporting students in navigating the administrative bureaucracy required of introducing a new garden on campus:

We don't necessarily control all of the different gardens, but if a group of students wants to start a new garden, we will help them navigate all of the administrative issues that come—provide them with some information, some advice, some resources.

In other cases, the motivation to engage and empower students derives from a deep, explicit dissatisfaction with student disempowerment. A student leader at the University of Calgary, in the process of launching a student-run food co-op to address student food insecurity and the lack of access to healthy and culturally relevant food on campus, observed:

We feel that students in general, not just at the University of Calgary, are a group, especially right now, [that] feels very apathetic and feels very much like they're without power. And so, by developing a good co-op that's democratically organized, it would allow students to get a little bit of that power back and be included in conversations about food on campus.

While more research is required to understand the full impact and implications of CFSAs on student engagement and empowerment, it is clear that these spaces do create meaningful opportunities for students. These initiatives create an integrating context (Eatmon et al., 2015) within which both

personal and community transformation can occur. As a student CFGS volunteer at Trent University put it, “volunteering or working at a local garden/farm and helping food grow is transformational in many ways. Individual, community, and environmental health issues seem a lot less daunting.” Another student, reflecting on their experience volunteering at the same school, remarked, “It was very valuable time for me in first year to meet like-minded people and get a break from the classroom/studying to spend time doing something I love. So I learned about myself through the campus farm.”

A student with the Lakehead Farm Club at Lakehead University explained how their experience as an organizer leading an effort to save a CFGS on their campus affected their approach to community organizing more broadly:

I learned to approach community organizing from a more patient and understanding perspective—rather than assuming those in positions of leadership are malevolent for their failure to lead amid a complex global crisis, but are rather simply ignorant to the problems and solutions. Being patient and understanding rather than annoyed and combative has helped to bridge differences and engage in more meaningful discourse (hopefully).

The Alternative Campus Foodscape and the Prospect of Transformation

On any given day, dedicated students on campuses across the country are struggling to prefigure more just and sustainable food systems on their campuses and beyond. The inroads they are making, while yet to be fully quantified, qualified, or understood, are nonetheless inspiring. In many cases, this success comes despite many challenges, from unstable funding and year-to-year continuity, to outreach and an overreliance on volunteer labor. In many cases, a key barrier to success is a lack of support from allied staff and faculty. As one student leader put it,

The real challenge is not . . . students collaborating with each other. . . . [They] have networks. . . . The big challenge . . . is finding

allies in the administration and finding allies in the staff.

Scaling a CFSa up on campus, and out beyond it, holds genuine promise as a strategy for realizing food systems transformation. This work, in part, necessitates challenging existing power hierarchies and decentering centers of knowledge production. It involves faculty allies taking seriously the expertise of students and young people as agents of change, and focusing resources (time, money, research, and the like) on learning from and with them. In an era of acute socio-ecological, political, and economic upheaval, there is profound power in collective action. History has shown time and again that students have an impressive record of catalyzing such collective action, in some cases with world-defining impact.

Elements of the alternative campus foodscape gesture at the horizon of movements for food systems transformation, yet much more work is required to understand the impact, both realized and potential, of CFSAs. Our primary intention here was to propose a model that brings disparate campus-based, food-focused initiatives into a shared conceptual space. The work of quantifying

the impact of these interventions largely remains. Deep ethnographic, action-based research is sorely needed in this respect. Future work in this area will enable a more in-depth understanding of the potential and actual effectiveness of CFSAs to effect socio-ecological change. Similarly, research that investigates the contextual particularities of place, focused on discrete campuses and their surrounding communities, will help to refine thinking on the movement-building role of campus actors in the context of food systems transformation. This work could include, for example, exploring the tensions that may exist between and among student leaders and groups, and network mapping to illustrate how and with whom CFSa leaders are working on campus and beyond. This is a crucial point: to the extent that campus movements have historically contributed to socio-ecological change, they have done so through allyship with actors beyond campus. Most importantly, future work must center the experience and expertise of the students and their allies who are at the forefront of prefiguring anti-colonial, anti-oppressive, equitable, and sustainable food futures.

References

- Aftandilian, D., & Dart, L. (2013). Using garden-based service-learning to work toward food justice, better educate students, and strengthen campus-community ties. *Journal of Community Engagement and Scholarship*, 6(1), 55–69. <https://doi.org/10.54656/YTIG9065>
- Agua, J., & Pendakur, S. L. (2019). From resistance to resilience: Transforming institutional racism from the inside out. In D. L. Morgan & C. H. F. Davis III (Eds). *Student activism, politics, and campus climate in higher education* (pp. 164–181). Routledge. <https://doi.org/10.4324/9780429449178-10>
- Anderson, C. R., Binimelis, R., Pimbert, M. P., & Rivera-Ferre, M. G. (2019). Introduction to the symposium on critical adult education in food movements: Learning for transformation in and beyond food movements—The why, where, how and the what next? *Agriculture and Human Values*, 36(3), 521–529. <https://doi.org/10.1007/s10460-019-09941-2>
- Angstmann, J. L., Rollings, A. J., Fore, G. A., & Sorge, B. H. (2019, April 29). A pedagogical framework for the design and utilization of place-based experiential learning curriculum on a campus farm. *Journal of Sustainability Education*. http://www.susted.com/wordpress/content/a-pedagogical-framework-for-the-design-and-utilization-of-place-based-experiential-learning-curriculum-on-a-campus-farm_2019_04/
- Astin, A. W., Astin, H. S., Bayer, A. E., & Bisconti, A. S. (1975). *The power of protest*. Jossey-Bass.
- Attfield, P. (2014, October 21). Campus eating beyond fast food or the meal plan. *Globe and Mail*. <https://www.theglobeandmail.com/news/national/education/campus-eating-beyond-fast-food-or-the-meal-plan/article21186954/>
- Barlett, P. F. (2011). Campus sustainable food projects: Critique and engagement. *American Anthropologist*, 113(1), 101–115. <https://doi.org/10.1111/j.1548-1433.2010.01309.x>

- Barlett, P. F. (2017). Campus alternative food projects and food service realities: Alternative strategies. *Human Organization*, 76(3), 189–203. <https://doi.org/10.17730/0018-7259.76.3.189>
- Bohunicky, M., Desmarais, A. A., & Entz, M. (2019). Self-operated vs. corporate contract: A study of food procurement at two universities in Manitoba. *Canadian Food Studies / La revue canadienne des études sur l'alimentation*, 6(1), 43–74. <https://doi.org/10.15353/cfs-rcea.v6i1.280>
- Bradley, S. M. (2015). Black power and the big green: Dartmouth College and the Black freedom movement, 1945–75. *Journal of Civil and Human Rights*, 1(1), 25–55. <https://doi.org/10.5406/jcivihumarigh.1.1.0025>
- Broadhurst, C. J., & Velez, A. L. (2019). Historical and contemporary contexts of student activism in U.S. higher education. In D. L. Morgan & C. H. F. Davis III (Eds.), *Student activism, politics, and campus climate in higher education* (pp. 3–20). Routledge. <https://doi.org/10.4324/9780429449178-1>
- Bruening, M., Agro, K., Payne-Sturges, D., & Laska, M. N. (2017). The struggle is real: A systematic review of food insecurity on postsecondary education campuses. *Journal of the Academy of Nutrition and Dietetics*, 117(11), 1767–1791. <https://doi.org/10.1016/j.jand.2017.05.022>
- Burley, D., Coker, E., May, B., McCarty, T., Dickerson, E., Milligan, B., Moses, D., Sanchez, S., & Hortman, R. (2016). Taking the challenge for real food: Student engagement in procuring sustainably produced food on campus. *Journal of Agriculture, Food Systems, and Community Development*, 7(1), 71–87. <https://doi.org/10.5304/jafscd.2016.071.011>
- Burton, J. D. (2007). Collegiate living and Cambridge justice: Regulating the colonial Harvard student community in the eighteenth century. In H. S. Wechsler, L. F. Goodchild, & L. Eisenmann (Eds.), *The history of higher education, ASHE reader* (3rd ed., pp. 126–138). Pearson Education.
- Classens, M., Adam, K., Crouthers, S. D., Sheward, N., & Lee, R. (2021). Campus food provision as radical pedagogy? Following students on the path to equitable food systems. *Frontiers in Sustainable Food Systems*, 5. <https://doi.org/10.3389/fsufs.2021.750522>
- Classens, M., & Burton, N. (2022). Prefigurative spaces of critical food literacy: The case for campus food growing spaces. In K. Kevenay & P. Prosperi (Eds.), *Routledge Handbook for Sustainable Diets*. Routledge.
- Classens, M., & Sytsma, E. (2020). Student food literacy, critical food systems pedagogy, and the responsibility of postsecondary institutions. *Canadian Food Studies La Revue Canadienne Des études Sur l'alimentation*, 7(1), 8–19. <https://doi.org/10.15353/cfs-rcea.v7i1.370>
- Cole, R. M., & Heinecke, W. F. (2020). Higher education after neoliberalism: Student activism as a guiding light. *Policy Futures in Education*, 18(1), 90–116.
- Creed, P. G. (2001). The potential of foodservice systems for satisfying consumer needs. *Innovative Food Science & Emerging Technologies*, 2(3), 219–227. [https://doi.org/10.1016/S1466-8564\(01\)00034-0](https://doi.org/10.1016/S1466-8564(01)00034-0)
- Eatmon, T. D., Krill, H. E., & Rynes, J. J. (2016). Food production as a niche innovation in higher education. In W. Leal Filho & M. Zint (Eds.), *The contribution of social sciences to sustainable development at universities* (pp. 145–159). Springer International. https://doi.org/10.1007/978-3-319-26866-8_9
- Eatmon, T., Pallant, E., & Laurence, S. (2015). Food production as an integrating context for campus sustainability. In W. Leal Filho, N. Muthu, G. Edwin, & M. Sima (Eds.), *Implementing campus greening initiatives* (pp. 325–336). Springer International. https://doi.org/10.1007/978-3-319-11961-8_24
- Fanshel, R. Z., & Iles, A. (2020). Transforming the campus foodscape through participatory mapping. *Case Studies in the Environment*, 4(1), Article 1120325. <https://doi.org/10.1525/cse.2020.1120325>
- Fanshel, R. Z., & Iles, A. (2022). Mapping inequity: The campus foodscape as pedagogy and practice. *Frontiers in Sustainable Food Systems*, 6. <https://www.frontiersin.org/article/10.3389/fsufs.2022.759076>
- Flowers, R., & Swan, E. (2012). Pedagogies of Doing Good: Problematisations, Authorities, Technologies and Teleologies in Food Activism. *Australian Journal of Adult Learning*, 52(3), 532–572.
- Gardener, L. D. (2012). *Down on the farm: A qualitative study of sustainable agriculture and food systems education at liberal arts colleges and universities* [Master's thesis, Michigan State University]. MSU Libraries Digital Repository. <https://doi.org/doi:10.25335/M5J69H>
- Goodman, D., DuPuis, M., & Goodman, M. (2012). *Alternative food networks: Knowledge, practice, and politics*. Routledge. <https://doi.org/10.4324/9780203804520>

- Green, A. S. (2021). “A new understanding and appreciation for the marvel of growing things”: Exploring the college farm’s contribution to transformative learning. *Food, Culture & Society*, 24(3), 481–498.
<https://doi.org/10.1080/15528014.2021.1883920>
- Hilchey, D. (2012). In this issue: Higher education and food systems: A tentative but growing relationship. *Journal of Agriculture, Food Systems, and Community Development*, 2(3), 1–3. <https://doi.org/10.5304/jafscd.2012.023.019>
- Hope, E. C., Keels, M., & Durkee, M. I. (2016). Participation in Black Lives Matter and deferred action for childhood arrivals: Modern activism among Black and Latino college students. *Journal of Diversity in Higher Education*, 9(3), 203–215. <https://doi.org/10.1037/dhe0000032>
- Hove, B., & Dube, B. (2022). What now for the Zimbabwean student demonstrator? Online activism and its challenges for university students in a COVID-19 lockdown. *International Journal of Higher Education*, 11(2), 100–108.
<https://doi.org/10.5430/ijhe.v11n2p100>
- International Panel of Experts on Sustainable Food Systems. (2022). *Another perfect storm? How the failure to reform food systems has allowed the war in Ukraine to spark a third global food price crisis in 15 years, and what can be done to prevent the next one*. <https://ipes-food.org/pages/foodpricecrisis>
- Jordan, N., Grossman, J., Lawrence, P., Harmon, A., Dyer, W., Maxwell, B., Cadieux, K. V., Galt, R., Rojas, A., Byker, C., Ahmed, S., Bass, T., Kebreab, E., Singh, V., Michaels, T., & Tzenis, C. (2014). New curricula for undergraduate food-systems education: A sustainable agriculture education perspective. *NACTA Journal*, 58(4), 302–310.
<https://escholarship.org/uc/item/88v5z424>
- Joseph, P. E. (2003). Dashikis and democracy: Black studies, student activism, and the Black power movement. *Journal of African American History*, 88(2), 182–203. <https://doi.org/10.2307/3559065>
- Kimball, E. W., Moore, A., Vaccaro, A., Troiano, P. F., & Newman, B. M. (2016). College students with disabilities redefine activism: Self-advocacy, storytelling, and collective action. *Journal of Diversity in Higher Education*, 9(3), 245–260. <https://doi.org/10.1037/dhe0000031>
- LaCharite, K. (2016). Re-visioning agriculture in higher education: The role of campus agriculture initiatives in sustainability education. *Agriculture and Human Values*, 33, 521–535. <https://doi.org/10.1007/s10460-015-9619-6>
- Loaded Ladle, The. (n.d.). *Our roots*. Retrieved May 11, 2023, from <https://www.loadedladle.com/our-vision>
- Levkoe, C. Z., Erlich, S., & Archibald, S. (2019). Campus Food Movements and Community Service-Learning: Mobilizing Partnerships through the Good Food Challenge in Canada. *Engaged Scholar Journal: Community-Engaged Research, Teaching, and Learning*, 5(1), Article 1. <https://doi.org/10.15402/esj.v5i1.67849>
- Linder, C., Quaye, S. J., Lange, A. C., Evans, M. E., & Stewart, T. J. (2019). *Identity-based student activism: Power and oppression on college campuses*. Routledge. <https://doi.org/10.4324/9780429060588>
- Lyson, T. A. 2004. *Civic agriculture: Reconnecting farm, food, and community*. Tufts University Press.
- Maharaj, J. (2020). *Take back the tray: Revolutionizing food in hospitals, schools, and other institutions*. ECW Press.
- Martin, S. J., & Andr  e, P. (2012). The “buy local” challenge to institutional foodservice corporations in historical context. *Journal of Agriculture, Food Systems, and Community Development*, 2(3), 161–175.
<https://doi.org/10.5304/jafscd.2012.023.008>
- Mayer, A., & Mayer, J. (1974). Agriculture, the island empire. *Daedalus*, 103(3), 83–95.
<https://www.jstor.org/stable/20024221>
- Maynard, M. S., Meyer, S. B., Perlman, C. M., & Kirkpatrick, S. I. (2018). Experience of food insecurity among undergraduate students: “You can’t starve yourself through school.” *Canadian Journal of Higher Education*, 48(2), 130–148. <https://doi.org/10.47678/cjhe.v48i2.188121>
- Meal Exchange. (2021). *2021 national student food insecurity report*.
<https://static1.squarespace.com/static/5fa8521696a5fd2ab92d32e6/t/6318b24f068ccf1571675884/1662562897883/2021+National+Student+Food+Insecurity+Report+-3.pdf>
- Meek, D., & Tarlau, R. (2016). Critical food systems education (CFSE): Educating for food sovereignty. *Agroecology and Sustainable Food Systems*, 40(3), 237–260. <https://doi.org/10.1080/21683565.2015.1130764>
- Michigan State University Center for Regional Food Systems. (n.d.). *About*. Retrieved October 17, 2022, from <https://www.canr.msu.edu/foodsystems/about/>

- Mirwaldt, P. (2010). Health and wellness services. In D. H. Cox & C. C. Strange (Eds.), *Achieving student success: Effective students services in Canadian higher education* (pp. 124–140). McGill-Queen's University Press.
- Moore, K. (1976). Freedom and constraint in eighteenth century Harvard. *Journal of Higher Education*, 47(6), 649–659. <https://doi.org/10.2307/1979120>
- Nazim, A., Martinez, S., Byrd, A., Robinson, D., Bianco, S., Maguire, J., Crutchfield, R. M., Condrón, K., & Ritchie, L. (2019). A systematic review of food insecurity among US students in higher education. *Journal of Hunger and Environmental Nutrition*, 14(5), 725–740. <https://doi.org/10.1080/19320248.2018.1484316>
- Pandit, H. (2019). Schools of resistance—A brief history of student activism in Kashmir. *Postcolonial Studies*, 22(1), 95–116. <https://doi.org/10.1080/13688790.2019.1568171>
- Parr, D. M., & Trexler, C. J. (2011). Students' Experiential Learning and Use of Student Farms in Sustainable Agriculture Education. *Journal of Natural Resources and Life Sciences Education*, 40(1), 172–180. <https://doi.org/10.4195/jnrlse.2009.0047u>
- Peters, D. (2015, March 11). *The campus food revolution: When students and administrators join resources to improve the food on campus, cafeteria is no longer a dirty word*. University Affairs / Affaires universitaires. <https://www.universityaffairs.ca/features/feature-article/the-campus-food-revolution/>
- Rentschler, C. A. (2018). #MeToo and student activism against sexual violence. *Communication, Culture and Critique*, 11(3), 503–507. <https://doi.org/10.1093/ccc/tcy022>
- Rhoades, G. D. (2019). Foreword. In D. L. Morgan & C. H. F. Davis III (Eds.), *Student activism, politics, and campus climate in higher education* (pp. x–xiv). Routledge.
- Roberts-Stahlbrand, A. (2020). *Is the meal hall part of the campus learning system? Investigating informal learning in a university residence meal hall* [Master's thesis, University of Toronto]. University of Toronto TSpace. <https://hdl.handle.net/1807/103281>
- Rogers, I. X. (2012). *Black campus movement: Black students and the radical reconstitution of American higher education, 1965–1972*. Palgrave Macmillan.
- Sayre, L. B. (2022). Introduction: The student farm movement in context. In L. B. Sayre & S. Clark (Eds.), *Fields of learning: The student farm movement in North America* (pp. 1–30). University Press of Kentucky. (Original work published 2011.) <https://www.jstor.org/stable/j.ctt2jcw bq.7>
- Sayre, L. B., & Clark, S. (2022). *Fields of learning: The student farm movement in North America*. University Press of Kentucky. (Original work published 2011.) <https://www.jstor.org/stable/j.ctt2jcw bq>
- Stahlbrand, L. (2019). Disruptive innovation and operationalization in local and sustainable food systems: Examining the University of Toronto-Local Food Plus partnership. *Canadian Food Studies / La revue canadienne des études sur l'alimentation*, 6(1), 120–139. <https://doi.org/10.15353/cfs-rcea.v6i1.269>
- Sumner, J. (2016). Introduction. In J. Sumner (Ed.), *Learning, food, and sustainability* (p. xix–xxxi). Palgrave MacMillan. <https://doi.org/10.1057/978-1-137-53904-5>
- Tong, K.-l., & Yuen, S. (2021). Disciplining student activism: Secondary schools as sites of resistance and control in Hong Kong. *Sociological Forum*, 36(4), 984–1004. <https://doi.org/10.1111/socf.12744>
- UBC Farm. (n.d.). *About us*. University of British Columbia. Retrieved May 11, 2023, from <https://ubcfarm.ubc.ca/about/>
- Vaccaro, A., & Mena, J. A. (2011). It's not burnout, it's more: Queer college activists of color and mental health. *Journal of Gay & Lesbian Mental Health*, 15(4), 339–367. <https://doi.org/10.1080/19359705.2011.600656>
- Valley, W., Wittman, H., Jordan, N., Ahmed, S., & Galt, R. (2018). An emerging signature pedagogy for sustainable food systems education. *Renewable Agriculture and Food Systems*, 33(5), 467–480. <https://doi.org/10.1017/S1742170517000199>
- Vetere, H. L. (2010). Housing and residence life. In D. H. Cox & C. C. Strange (Eds.), *Achieving student success: Effective students services in Canadian higher education* (pp. 77–88). McGill-Queen's University Press.
- Wheatle, K. I. E., & Commodore, F. (2019). Reaching back to move forward: The historic and contemporary role of student activism in the development and implementation of higher education policy. *Review of Higher Education*, 42(5), 5–35. <https://doi.org/10.1353/rhe.2019.0043>

Appendix. Working Lists of Campus Food Systems Alternatives (CFSAs) in Canada

Note: We title this figure in acknowledgment of the fact that the list is not exhaustive. This is partly a function of not all CFSAs having an online presence, and partly in recognition of the fact that our internet scan might not have found all CFSAs, even if they are online.

Abbreviations

CFGs: Campus food growing space

CFSA: Campus food systems alternative

CFSS: Campus food serving space

Table A1. Initiatives Initiatives Included in the Interviews

Province / Institution	City	Name of Initiative	Classification
Alberta			
University of Alberta	Edmonton	Green and Gold Community Garden	CFGs
University of Alberta	Edmonton	Campus Foodbank at the University of Alberta	CFSS
University of Calgary	Calgary	Campus Community Garden at uCalgary	CFGs
University of Calgary	Calgary	uCalgary Simon Farm Project	CFGs
University of Calgary	Calgary	uCalgary Food Co-op (currently only in the planning phases)	CFSS
British Columbia			
Kwantlen Polytechnic University (KPU)	Surrey	Westerman Campus Garden	CFGs
Simon Fraser University	Burnaby	Embark Learning Garden	CFGs
University of British Columbia	Vancouver	AMS Food Bank at UBC	CFSS
University of Victoria	Victoria	University of Victoria campus community gardens	CFGs
Manitoba			
Brandon University	Brandon	Brandon University Gardens	CFGs
Newfoundland and Labrador			
Memorial University (Labrador Campus)	Happy Valley-Goose Bay	Pye Centre for Northern Boreal Food Systems	CFGs
Nova Scotia			
Mount Saint Vincent University	Halifax	The Mount Community Garden	CFGs
University of Kings College	Halifax	The King's Galley Café	CFSS
Ontario			
Brescia University College	London	Brescia University College Community Garden	CFGs
Durham College (Whitby Campus)	Whitby	Barrett Centre of Innovation in Sustainable Urban Agriculture	CFGs
Humber College	Toronto	Humber College Food Learning Garden	CFGs
Humber College	Toronto	Soup Bar	CFSS
McMaster University	Hamilton	Food Collective Centre at McMaster	CFSS
Mohawk College	Hamilton	Mohawk College Community Garden and Farm Stand	CFGs/CFSS

Province / Institution	City	Name of Initiative	Classification
Queen's University	Kingston	The Tea Room	CFSS
Ryerson University	Toronto	Ryerson Urban Farm	CFGS
Seneca College	Toronto	Seneca College Urban Farm	CFGS
Trent University	Peterborough	BIPOC Growing Collective	CFGS
Trent University	Peterborough	Bric-à-Brac Café	CFSS
Trent University	Peterborough	Peterborough Community Medicine Garden	CFGS
Trent University	Peterborough	Trent Apiary	CFGS
Trent University	Peterborough	Trent Market Garden	CFGS
Trent University	Peterborough	Trent Oxfam Garden	CFGS
Trent University	Peterborough	Trent Vegetable Gardens	CFGS
University of Guelph	Guelph	The Guelph Centre for Urban Organic Farming	CFGS
University of Ottawa	Ottawa	People's Republic of Delicious (PRD)	CFSS
University of Toronto	Toronto	Caffiends	CFSS
University of Toronto	Toronto	Diabolos' Coffee Bar	CFSS
University of Toronto (Mississauga Campus)	Mississauga	UTM Community Food Garden	CFGS
University of Toronto (St. George Campus)	Toronto	Dig In! Campus Agriculture Network	CFGS
University of Toronto Scarborough (UTSC)	Scarborough	Campus Teaching Farm	CFGS
University of Waterloo	Waterloo	UW Farm Market	CFSS
University of Waterloo	Waterloo	WUSA Food Support Service	CFSS
Western University	London	EnviroWestern Community Garden	CFGS
Western University	London	Food Support Services at Western University	CFSS
Wilfrid Laurier University	Waterloo	LSPIRG Garden & Foodbank	CFGS/CFSS
Wilfrid Laurier University	Waterloo	Wilfrid Laurier University Gardens—Northdale Garden	CFGS
York University	Toronto	Maloca Community Garden	CFGS
Prince Edward Island			
University of PEI (UPEI)	Charlottetown	St. Dunstan's Gardens	CFGS
University of PEI (UPEI)	Charlottetown	Soup for the Soul	CFSS
University of PEI (UPEI)	Charlottetown	UPEI Food Bank	CFSS
Quebec			
Bishop's University	Sherbrooke	Educational Farm	CFGS
Concordia University	Montreal	Hive Café Solidarity Co-op and Hive Free Lunch	CFSS
Concordia University	Montreal	The People's Potato	CFSS
McGill University	Montreal	The McGill Farmer's Market	CFSS
McGill University (Macdonald Campus)	Sainte-Anne-de-Bellevue	Macdonald Student-run Ecological Garden (MSEG)	CFGS

Province / Institution	City	Name of Initiative	Classification
Saskatchewan			
University of Regina	Regina	Student Union Pantry at the University of Regina	CFSS
University of Regina	Regina	University of Regina Green Patch Garden	CFGS
University of Saskatchewan	Saskatoon	McEown Community Garden	CFGS

Table A2. Other Initiatives Identified Through Internet Search

Province / Institution	City	Name of Initiative	Classification
Alberta			
MacEwan University	Edmonton	MacEwan Garden	CFGS
University of Alberta	Edmonton	Campus Community Gardens	CFGS
University of Alberta	Edmonton	Indigenous Teaching and Learning Gardens	CFGS
University of Alberta	Edmonton	Prairie Urban Farm	CFGS
University of Alberta	Edmonton	University of Alberta Farmer's Market	CFSS
University of Lethbridge	Lethbridge	Campus Garden – Campus Roots	CFGS
University of Lethbridge	Lethbridge	Nourish	CFSS
British Columbia			
Capilano University	Vancouver	Campus Community Garden	CFGS
Kwantlen Polytechnic University	Surrey	Grassroots Café & Lounge	CFSS
Simon Fraser University	Burnaby	Food Rescue (Embark)	CFSS
Simon Fraser University	Burnaby	SFU Pocket Farmers' Market	CFGS
University of British Columbia	Vancouver	Agora Café (previously called Roots)	CFSS
University of British Columbia	Vancouver	Foood	CFSS
University of British Columbia	Vancouver	Roots on the Roof	CFGS
University of British Columbia	Vancouver	Sprouts and Seedlings Café/Eatery	CFSS
University of British Columbia	Vancouver	Tu'wusht Garden Project	CFGS
University of British Columbia	Vancouver	UBC Farm	CFGS
University of British Columbia	Vancouver	UBC Farmers' Market	CFSS
University of Northern British Columbia	Prince George	University Farmers' Market	CFSS
Vancouver Island University	Nanaimo	The Campus Community Garden	CFGS
Manitoba			
Assiniboine Community College	Brandon	Assiniboine Community College Gardens	CFGS
Brandon University	Brandon	Brandon University Food Bank	CFSS
Canadian Mennonite University	Winnipeg	Canadian Mennonite University Gardens	CFGS
University of Manitoba	Winnipeg	UMSU Garden	CFGS
University of Winnipeg	Winnipeg	Diversity Food Services	CFSS
University of Winnipeg	Winnipeg	Langside Learning Garden	CFGS
Wesley College	Winnipeg	Wesley College Gardens	CFGS

Province / Institution	City	Name of Initiative	Classification
New Brunswick			
Mount Allison University	Sackville	Indigenous Gardens Project – the Three Sisters Garden	CFGS
Mount Allison University	Sackville	Mount Allison University Farm	CFGS
University of New Brunswick	Fredericton	UNB Free Food Planters	CFGS
University of New Brunswick	Fredericton	University of New Brunswick Gardens	CFGS
Newfoundland and Labrador			
Memorial University	St. John's	Campus Foodbank at Memorial University	CFSS
Memorial University	St. John's	Memorial University Gardens	CFGS
University of New Brunswick	St. John's	UNB Community Garden	CFGS
Nova Scotia			
Acadia University	Wolfville	Acadia University Community Farm	CFGS
Cape Breton University	Sydney	Cape Breton University Community Garden	CFGS
Dalhousie University	Truro	Chef's Garden	CFGS
Dalhousie University	Halifax	Dalhousie Farmer's Market	CFSS
Dalhousie University	Halifax	Dalhousie Urban Garden Society	CFGS
Dalhousie University	Halifax	The Loaded Ladle	CFSS
St Mary's University	Halifax	St Mary's University Community Garden	CFGS
University St-Anne	Pointe-de-l'Église	Café Bric-à-Brac	CFSS
Ontario			
Algoma University (Main Campus)	Brampton	The People's Garden	CFGS
Brock University	St. Catharines	Brock Community Garden	CFGS
Brock University	St. Catharines	Food First Program at Brock	CFSS
Carleton University	Ottawa	The Garden Spot / The Carlton Food Collective	CFSS
Conestoga College	Cambridge	Conestoga College Gardens	CFGS
Conestoga College	Cambridge	Conestoga College Indigenous Food Garden	CFGS
Georgian College	Barrie	Georgian College Garden	CFGS
Laurentian University	Sudbury	Laurentian University Garden	CFGS
Loyalist College	Belleville	Loyalist College Garden	CFGS
McMaster University	Hamilton	Bridges Café	CFSS
McMaster University	Hamilton	Food for Thought	CFSS
McMaster University	Hamilton	McMaster Community Garden	CFGS
McMaster University	Hamilton	McMaster Teaching and Community Garden	CFGS
Niagara College	Welland	Nourishing Minds Fund	CFSS
OCAD University	Toronto	grOCAD's Community Garden Project	CFGS
OCAD University	Toronto	Hot Lunch	CFSS
Ontario Tech University	Oshawa	Ontario Tech University Gardens	CFGS
Queen's University	Kingston	Common Grounds Coffee House (and "The Brew," which is their other location)	CFSS
Queen's University	Kingston	Community Gardens at Queen's	CFGS

Province / Institution	City	Name of Initiative	Classification
Ontario (continued)			
Queen's University	Kingston	Good Times Diner	CFSS
Ryerson University	Toronto	Good Food Centre at Ryerson (previously known as the Community Food Room)	CFSS
Sheridan College	Trafalgar and Davis Campus	Sheridan College Gardens	CFGS
Trent University	Peterborough	Trent Farm	CFGS
University of Ottawa	Ottawa	University of Ottawa Community Gardens	CFGS
University of Toronto	Toronto	The Sky Garden	CFGS
University of Toronto	Toronto	UofT Global Kitchen	CFSS
University of Toronto (St. George Campus)	Toronto	Regenesys Youth Food Centre	CFGS
University of Toronto Scarborough (UTSC)	Scarborough	Grow the Roof – UTSC IC Rooftop Garden	CFGS
University of Toronto Scarborough (UTSC)	Scarborough	U of T Scarborough Farmers' Market	CFSS
University of Toronto Scarborough (UTSC)	Scarborough	University of Toronto Scarborough Gardens	CFGS
University of Waterloo	Waterloo	Environmental Studies Coffee Shop	CFSS
University of Waterloo	Waterloo	University of Waterloo Gardens	CFGS
University of Windsor	Windsor	University of Windsor Campus Community Garden	CFGS
Western University	London	King's Community Garden	CFGS
Western University	London	Western University Friends of Gardeners	CFGS
York University (Keele Campus)	Toronto	YUM! Market	CFSS
Quebec			
Concordia University	Montreal	Campus Potager	CFGS
Concordia University	Montreal	Concordia University Greenhouse (part of Concordia's City Farm School)	CFGS
Concordia University (Loyola Campus)	Montreal	Concordia University City Farm School	CFGS
Concordia University (Loyola Campus)	Montreal	Concordia University Loyola gardens (part of Concordia's City Farm School)	CFGS
Concordia University	Montreal	Mother Hubbard's Cupboard	CFSS
Concordia University	Montreal	Le Frigo Vert	CFSS
L'Université du Québec à Montréal	Sherbrooke	Le Crapaud	CFGS
McGill University	Montreal	Urban Gardens / Campus Crops	CFGS
McGill University	Montreal	Midnight Kitchen	CFSS
McGill University	Montreal	Student-Run Cafe (The Nest)	CFSS
McGill University	Montreal	AUS Snax	CFSS
McGill University	Montreal	The Coffee Co-op	CFSS
Université de Montréal	Montreal	En Vrac	CFSS
Université de Montréal	Montreal	Université de Montréal Gardens	CFGS

Province / Institution	City	Name of Initiative	Classification
Quebec (<i>continued</i>)			
Université de Sherbrooke	Sherbrooke	Des Campus Nourriciers	CFGS
Université du Québec à Chicoutimi	Chicoutimi	Université du Québec à Chicoutimi Campus Food System	CFSS
Saskatchewan			
University of Saskatchewan	Saskatoon	Horticulture Club Community Garden	CFGS

Assessing the impact of parental involvement on scaling agricultural technologies from school garden to home farm in Cambodia

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Abstract

Cambodia is a predominantly rural nation with a heavy dependence on agriculture, particularly smallholder rice farming systems. While several sustainable agricultural technologies have been suc-

cessfully piloted on research stations or with small numbers of early adopters, questions remain on how to extend these technologies to large numbers of resource-poor smallholder farmers. The Scaling Suitable Sustainable Technologies Project (S3-Cambodia) seeks to examine pathways for scaling sustainable intensification (SI) technologies to smallholder farmers. One of the identified pathways to scaling SI is through the education system. Cambodian youth serve as an entry point to extend target technologies to farm families through experiential learning opportunities in schools by establishing “green labs” featuring school gardens.

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Author Note

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This research study seeks to support the desired outcomes of the S3-Cambodia project by assessing Cambodian parental involvement in their children's lives and school activities. While students can serve as agricultural education sources for their homes and communities, there is a need to determine whether relationships between children, parents, and schools in Cambodia are strong enough to facilitate this knowledge transfer. Primary data was collected from 178 parents whose children attend three separate high schools in three districts of Cambodia through one-on-one orally conducted surveys. These were supplemented by key informant interviews of selected parents, teachers, and principals at each high school. Results indicate that parents have a strong interest in school garden implementation and activities at their children's school, with 84% of parents interested in visiting a school garden. Additionally, the majority believe that they can learn from their children (65%) and actively discuss with their children what they are learning at school (72%), indicating a potentially significant likelihood of knowledge transfer from a school garden. Yet, parents' involvement in their children's schools and lives varies between regions, with the rurality of the households influencing family social ties and homes' proximity to the school.

Keywords

Sustainable Intensification, School Gardens, Cambodia, Knowledge Transfer, Diffusion, Experiential Learning

Introduction and Literature Review

Cambodia is currently undergoing rapid economic and social changes as the young population moves beyond decades of war and transitions to more democratic institutions and free market policies. Despite strong economic growth and poverty reduction, Cambodia remains a predominantly rural country with a weak educational system and economic dependence on agriculture. More than 70% of the Cambodian population is engaged in the agricultural sector (Ran et al., 2013). These are mainly rural households with high levels of poverty and food insecurity, and they face ever-changing circumstances exacerbated by climate change. Fur-

thermore, the Cambodian education system has been weakened by the effects of war and genocide in the country. During the 1970s, under the Khmer Rouge, the people of Cambodia were forced to live communally and depend on collective agriculture. Starvation, hard labor, knowledge destruction, and summary execution resulted in a nation severely lacking in intellectuals and teachers with sufficient content and pedagogy knowledge (Islam et al., 2017). As research has increasingly established causal linkages between food insecurity and global, national, and regional conflict, it is all the more necessary to address sustainability in Cambodia's agriculture sector (Martin-Shields & Stojetz, 2018).

This paper describes research supporting the Scaling Suitable Sustainable Technologies (S3-Cambodia) project, funded by the US Agency for International Development (USAID) Feed the Future Sustainable Intensification Innovation lab (SIIL). The research examines pathways for scaling suitable and sustainable technologies for smallholder, rice-based farmers. S3-Cambodia works to scale three sustainable intensification (SI) technologies to farmers: vegetable grafting, cover cropping, and wild gardens. These innovations promote the diversification and resilience of smallholder systems by introducing new sources of income and nutrition, across different agricultural spaces and serving different functions in livelihood strategies, to address seasonal "food gaps" (Ader et al., 2021).

Scaling SI Through School Gardens

SI is a promising vehicle to increase productivity and diversification for smallholder farmers in Cambodia and the wider Southeast Asia region (Petersen & Snapp, 2015). Both an approach and a goal in itself, SI is a relatively open concept, encompassing systems in which yields are increased without adverse environmental impact or additional land use. Rather than focusing on production goals, SI emphasizes a wide set of drivers and goals that can be achieved through numerous means (Pretty, 2018; Pretty & Bharucha, 2014). Zurek et al. (2015) define SI as the "production of more food on the same piece of land while reducing the negative environmental impacts and at the same time increasing the contributions to natural capital and flow of environmental services" (p. 24).

This has been further expanded to include social issues, economics, and the human condition as non-environmental factors for a balanced application of SI processes (Musumba et al., 2017).

While knowledge on SI technologies and practices is readily available, the actual dissemination of this knowledge and the subsequent adoption and scaling of SI technologies among smallholders continues to be a challenge globally. Barriers to adoption include but are not limited to weak social and capital networks, low-quality extension services, reliance on government support during crop failure, incidence of pests and diseases, resources constraints, lack of education, the inability to access markets, and the occurrence of climate shocks (Barrett et al., 2010; Jack, 2013; Kassie et al. 2015; Shilomboleni & De Plaen, 2019; Westermann et al., 2018). The key to addressing these gaps is to identify where farmers actually receive their information and distribute information through these networks. Cambodian youth serve as a potential entry point to extend target technologies to farm families through experiential learning opportunities in schools by establishing “green labs” featuring school gardens.

School gardens have been established as a successful learning tool to provide experiential agricultural education and food system training within primary and secondary schools across the globe. Yet, current research on school gardens prioritizes the analysis of student nutrition and vegetable consumption (Ferguson et al., 2019; Food and Agricultural Organization of the United Nations, 2004; Leuven et al., 2018; Ratcliffe et al., 2011; Schreinemachers et al., 2019). Less examined is the potential of school gardens to serve as forums for knowledge and skill transfer to households and communities (Cramer et al., 2019). Through S3-Cambodia, students receive a combination of hands-on training in SI practices and STEM-based instruction in SI principles. The long-term anticipated goal is that this preparation will culminate in the establishment of student home gardens featuring SI technologies. The process of technology evaluation and diffusion is supported by applied, participatory research on the agronomic and nutritional qualities and marketing potential.

Thus, the S3-Cambodia project seeks to lever-

age students’ potential to be agents of change in their homes and communities by engaging them in experiential learning around school gardens. Using knowledge gained through school garden education, students can serve as credible sources of information to their parents on best agriculture practices (Calub et al., 2019; Okiror et al., 2011; Sprague, 2016; Tabucanon & Mihara, 2016). Often, the implementation and scaling up of new technologies and innovations is met with apprehension due the economic, social, and health risks that come with crop failure (Shilomboleni & De Plaen, 2019; Westermann et al., 2018). School gardens provide a pathway to evaluate new technologies without personal risk. That being said, research has suggested using school gardens for this purpose is often dependent upon the parent’s involvement in their child’s life and schooling. In particular, social capital (parental beliefs, social networks, and trust) has been identified as a predictor of parental involvement in Cambodian children’s education (Eng et al., 2014). In a comprehensive literature review of school gardens as a method for scaling SI technologies, key opportunities for and barriers to scaling were identified (Table 1; Pekarcik & Ader, 2021). Including parents in the learning process and upkeep of school gardens was found to be a key component in assuring a successful and scalable school garden. Active parent involvement increased the likelihood of knowledge transfer from students to parents (Ferguson et al., 2019; Schreinemachers et al., 2017; Schreinemachers et al., 2019; Sprague et al., 2016).

While parents’ participation is an important determinant of the success of school gardens and information transfer, parental inclusion had not been fully considered by the S3-Cambodia project. It was understood that the establishment of green labs at high schools creates a strong linkage between institutions (i.e., NUBB, UTIA) and the education system. Additionally, decades of literature on scaling have shown that individual households are able to share information through social networks to increase adoption throughout a community (Feder & Umali, 1993; Ramirez, 2013). What was not yet fully understood was the link between schools and households in Cambodia. Thus, this research assessed parents’ perceived lev-

els of involvement in their child(ren)’s schools and daily lives to determine whether school facilities and instruction were a viable pathway for scaling to households in Cambodia.

Research Methods

Study Area and Population

Primary data was collected from parents, principals, and students of three separate high schools in three *khums* (communes) of Cambodia in the Battambang and Banteay Meanchey provinces. The data was collected through orally conducted one-on-one surveys and semi-structured key informant interviews (Table 1). Battambang and Banteay Meanchey are both located in northwest Cambodia and are the 5th and 8th largest provinces by population, respectively (National Institute of Statistics, 2019). Battambang province, known as “the rice bowl of Cambodia,” is characterized by its small-holder rice-based economy supported by the tropical climate, fertile soils, and sufficient water and irrigation capacities (Shapiro et al., 2021). Very similar to Battambang Province, Banteay Meanchey has a rice-focused economy based on small-scale agriculture. Livelihoods in both provinces are supported by rice production, fruit and vegetable production, fishing, wage work, and collecting wild food and forest products (Hought et al., 2012).

Data Collection and Analysis

Survey Data

A cross-sectional survey instrument was developed to assess parental perceptions of their involvement in their child(ren)’s lives and schools. Survey questions were modeled on parent/guardian survey

questions from a range of literature on school garden scaling (Pekarcik & Ader, 2021). Survey development and design was strongly influenced by Sprague et al.’s (2016) parent/guardian survey on barriers to and opportunities for scaling through instructional school gardens (p. 73). An advisory team with expertise in international agriculture research reviewed the survey and made recommendations to ensure content validity. Survey questions sought to measure parents’ perceptions of their current involvement in educational activities at their child’s school and their perceived communicational levels with their child both generally and related to education. To account for educational and programmatic differences between the schools, the survey instrument included a separate annex of questions for each school based on the agricultural education programming, or lack thereof, available at the school (Table 1). At the time of survey, Banan did not have any agriculture-based programming or a distinct school garden. Sampov had had a school garden on its grounds in the past, but it had since fallen out of use. Sampov now had access to a school garden through the Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE-SAIN). Rongko had access to a technology park with specialized life skills training curricula in nursing, music, English, computer science, small-systems machinery, and, as of 2020, agriculture. Comparing the results of the survey across schools with different levels of agricultural education sought to provide a holistic assessment of relationships and knowledge transfer between parents, children, and schools.

All three of the selected high schools had established connections with the S3-Cambodia project and NUBB. Households for parent surveys

Table 1. Characteristics of High Schools Included in School Garden Surveys

School	Commune, District	Province	Students Enrolled	Life Skills Training Provided
Sor Kheng Kanteu II High School (Banan)	Kantueu Pir, Banan	Battambang	1,300	None
Hun Sen Sampov High School (Sampov)	Phnum Sampov, Banan	Battambang	1,418	School Garden— <i>Agriculture</i>
Rongko High School (Rongko)	Chamnaom, Mongkol Borey	Banteay Meanchey	1,208	Technology Park— <i>Nursing, Small Systems Machinery, Computer</i>

were identified through a stratified random sampling of 60 students from the 10th and 11th grades at each of the high schools. The number of students from the combined grades at Banan, Sampov, and Rongko were 536, 703, and 391, respectively. All of the students were in the age range of 16 to 20. The stratified sampling took into account the multiple villages that feed into each of the high schools, as villages in a single district vary in rurality and socioeconomic status. A sample size of 60 students per school was selected because it kept the study within its time and resource limits while also staying proportional to the total student population size. The students were sampled from only the 10th and 11th grades because the 12th graders were focused on national exams.

For each selected student, enumerators contacted the phone number provided by the school for the household and requested to visit the household and survey a parent/guardian. Enumerators visited the households that agreed to participate, a total of 178 households. Surveys lasted approximately 20 minutes, began with a verbal consent statement, and were conducted orally in a one-on-one setting to account for the literacy capabilities of participants. Research questions and objectives were evaluated through an SPSS analysis of survey responses. The descriptive statistics of survey responses were analyzed for each school individually and across schools to determine trends within and between parents whose children attended each high school.

Key Informant Interview Data

Household surveys were followed by in-person key informant interviews of parents, principals, and teachers at each of the three high schools. Three parents at each of the high schools were identified based on their perceived level of involvement in their child's life and schooling, for a total of nine parents interviewed. From each high school, selected parents included one parent who had relatively low involvement, one parent who had relatively average involvement, and one parent who had relatively high involvement. Involvement levels were determined by comparing the number of "yes" responses across surveys and grouping each survey into one of three categories: low, average,

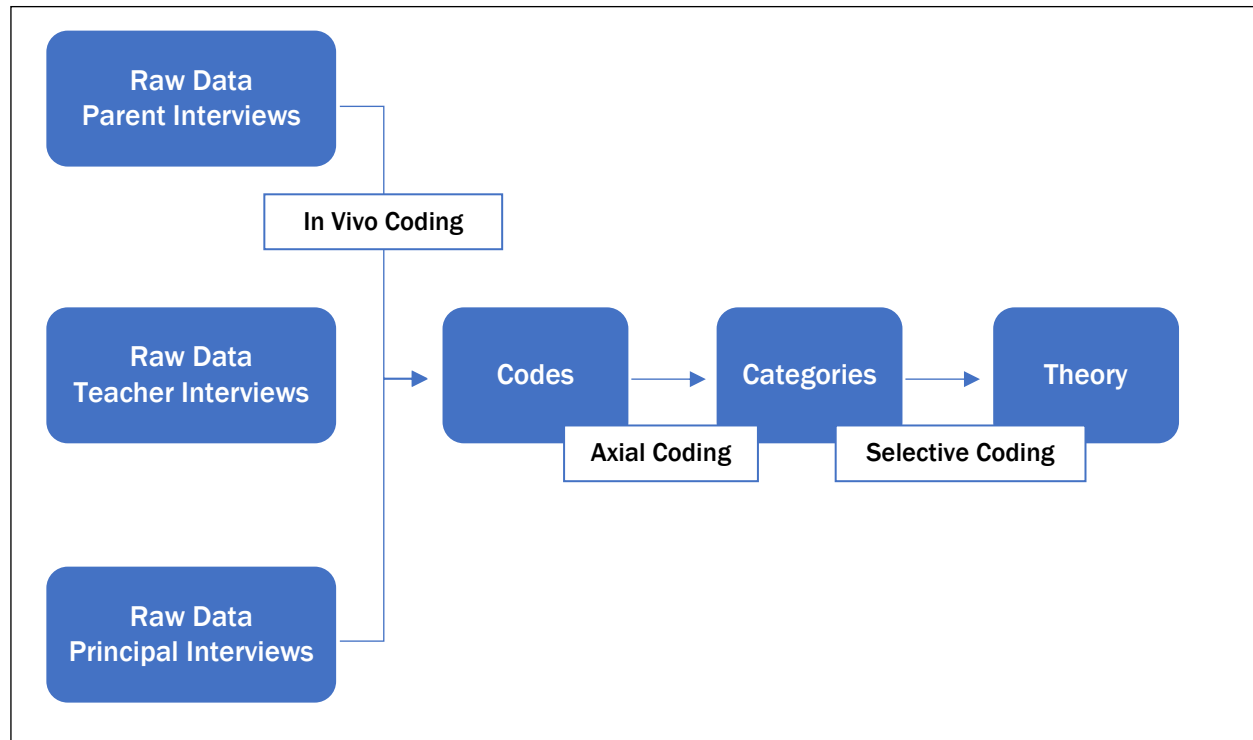
and high. In addition, the principal and two teachers were interviewed at each school, for a total of three principals and six teachers. Interviews were semi-structured, recorded, and lasted approximately 30 minutes. Parent interviews built upon survey questions and sought to gain a deeper knowledge of parents' involvement in school activities, their relationship with their child, their interest in and knowledge of new farming methods, and their thoughts on school gardens. Principal and teacher interviews built upon parent interviews. Their questions focused on their perceptions of parental involvement in the school, student-parent relationships, and student agricultural interest.

The data gathered from the key informant interviews was analyzed through a grounded theory analysis. The goal was to develop deeper understanding of the transfer of knowledge from the school garden to home farm. A method of qualitative research, grounded theory allows for the study of a process or phenomenon by collecting and analyzing of real-world data. From an inductive rather than deductive approach, new theories are derived from the gathered qualitative data (Urquhart et al., 2010). Key informant interview responses were analyzed through three rounds of coding, using NVivo. The first round utilized in vivo coding to determine initial codes. The in vivo coding assigned a label or "code" to a word or phrase from the interview transcripts. This was followed by axial coding, which used the initial codes and grouped them into logical categories. Finally, selective coding was used connect all of the categories together around one core category, serving as the grounded theory emerging from the research (Figure 1).

Assumptions and Limitations

The research plan assumed that a singular parent of each student would provide survey and interview responses when the enumerator teams visited the households. In reality, this was unlikely to have been the case for all households based upon livelihood activities, parents' job requirements, and the number of single-parent households. If a parent had not been available to answer survey questions when an enumerator visited the household, the enumerator surveyed any available adult at the

Figure 1. Grounded Theory Coding Process for Key Informant Interviews



household. This included grandparents, aunt, uncles, and older siblings. Some of these adults were in fact the primary guardian of the selected students, but this was not the case for all households. Due to the fact that US researchers were unable to be present in Cambodia during survey enumeration because of COVID-19 pandemic travel restrictions, it cannot be known definitively whether survey responses came from parents or another household adult. In actuality, it is likely that multiple household adults were present during the survey even if the responses were only recorded for one parent/guardian. During key informant interviews, any adult who was present at the household at the time added comments into the conversation, regardless of whether they were the parent/guardian being interviewed. Cambodia is a collectivist society with strong loyalty to family and community. As such, these group responses were allowed to occur due to the need to be culturally sensitive and for data to reflect the true dynamic of Cambodian households. The survey and interviews retain validity because the research purpose was to determine the scalability of SI technologies to

households (not only parents), with adults learning from children being identified as a key avenue to do so. For consistency, the term “parent” throughout the following text encompasses both parents and guardians unless the adult is specifically described.

Results and Discussion

Survey Results

In total, 178 parents were surveyed. Of these, 62 were from Rongko High School, 56 from Sampov High School, and 60 from Banan High School. Small variances in the number of parents surveyed per school were due to the availability of parents on the day of surveying. Rongko had over 60 responses because some households wanted both parents to be interviewed. Sampov had fewer than 60 responses due to some sampled households not having a parent/guardian available to take the survey.

Parent-School Visitation

Across the schools, fewer than half of parents

(43.5%) had visited the school their child(ren) were attending (Table 2). The percentage of parents who had visited the school was highest (50%) at Sampov and lowest (35.5%) at Rongko. The most common reason parents visited the school their child(ren) attended was because they had been specifically invited to the school and/or they attended a particular event. This was most common at Banan, where 92.6% of parents who had visited reported being invited to the school and 85.6% reported they had attended a particular event at the school. Additionally, parents at Banan were the most likely to have volunteered (48.1%) at the school. The least frequent reason across the schools that parents had visited was because they worked at the school. Parents at Rongko were least likely of all parents who had visited their child(ren)'s school to have picked their child up from school, volunteered at the school, and/or worked at the school.

Of the parents who had not visited the school their child(ren) were attending, the majority wanted to visit the school (69.9%) yet felt too busy to visit (75.4%; Table 2). Additionally, the majority of parents felt they needed an invitation from the school (59.4%) in order to visit. Of the parents at Banan who had not visited the school, the majority reported that they wanted to visit the school but felt they needed an invitation and felt too busy to visit. Sampov had the lowest percentage of parents who reported being interested in volunteering at

the school (17.9%) or who reported feeling they need an invitation to visit the school (35.7%). On the other hand, Rongko parents who had not visited the school were the most likely to want to visit the school, have an interest in volunteering at the school, feel they needed an invitation to visit, and feel too busy to visit (Table 2).

Parent-Child Relationship

The majority of parents across the schools stated they have a significant conversation (10+ minutes) with their child at least once per week (84.5%) or day (57.4%; Table 3). At both Rongko and Banan, approximately 90% of parents had a significant (10+ minute) conversation with their child at least once per week, compared to 73.2% of parents at Sampov. Parents claimed to have fewer daily significant conversations, dropping to 50% and 63.3% at Rongko and Banan, respectively. The percentage change was not as drastic for Sampov, but still dropped to 58.9%. Further, the majority believed that they can learn from their children (64.6%) and actively discuss with their children what they are learning at school (71.7%). By a smaller margin, the majority of parents (58.5%) knew what their child wanted to be when they grow up. Parents at Rongko were the most likely to believe that they can learn from their children and to discuss with their children what they are learning at school. Parents at Sampov were most likely to know what their child wanted to be when they grow up.

Table 2. Parent School Visitation Trends and Motivations by School

	Banan %	Sampov %	Rongko %
Parents who have visited the school	<i>n</i> = 27	<i>n</i> = 28	<i>n</i> = 22
Specifically invited to the school	92.6	60.7	81.8
Attended a particular event	85.2	64.3	72.7
Pick child up from school	33.3	57.1	31.8
Volunteered at the school	48.1	35.7	27.3
Worked at the school	14.8	25.0	4.5
Parents who have not visited the school	Banan %	Sampov %	Rongko %
	<i>n</i> = 33	<i>n</i> = 28	<i>n</i> = 40
Want to visit the school	66.6	60.7	82.5
Interested in volunteering	30.3	17.9	85.0
Feel they need an invitation	57.6	35.7	85.0
Too busy to visit	63.6	75.0	87.5

Table 3. Parent and Child Relationship Indicators by School

	Banan % (n = 60)	Sampov % (n = 56)	Rongko % (n = 62)
Parents who have a significant conversation (10+ min) 1×/day	63.3%	58.9%	50.0%
Parents who have a significant conversation (10+ min) 1×/week	90.0	73.2	90.3
Parents who know what their child wants to be when they grow up	45.0	66.1	64.5
Parents whose child discusses at home what they are learning at school	66.7	67.9	80.6
Parents who believe children can teach them new things	50.0	69.6	74.2

Parent-School Garden Interest

Results across schools indicate that parents generally have a strong interest in school garden implementation and activities at their children's school (Tables 4–6). In total, 84.6% parents were interested in visiting a school garden, 62.2% were interested in volunteering at a school garden, and 73.8% were interested in taking classes at a school garden.

Of the three schools, Rongko had the highest number of parents who stated a desire to visit, volunteer, or take classes at a school garden.

In the Banan annex questions, 83% of parents reported wanting to see a garden implemented at their child's school (Table 4). As for Sampov annex questions, 66.1% of parents knew that the school had access to a garden, and 17.9% had visited the garden (Table 5). The reported transfer of knowledge from accessible school gardens at Sampov was relatively low, with only 1.8% of parents reporting that their child had learned new farming techniques from the garden, 33.9% reporting that their child had not learned new farming techniques from the garden, and 60.7% reporting that they were uncertain whether their child learned from the garden. Likewise, only 16.1% parents reported they had learned new farming

techniques from the garden, and 35.7% stated their household did not have a farm or garden. Concerning Rongko annex questions, almost all parents (95%) wanted to see a garden implemented at the school (Table 6). Of Rongko parents, 33.8% knew that the school had access to a tech park, and 14.5% had visited the tech park. Reported agricultural learning from the tech park was low, with

Table 4. Annex Questions—Banan

	Frequency	% (n = 60)
Interested in visiting a school garden	48	80.0%
Interested in volunteering at a school garden	34	56.7
Interested in taking classes at a school garden	39	65.0
Had learned new things from child sharing about school	35	58.3
Wanted a school garden implemented	50	83.3

Table 5. Annex Questions—Sampov

	Frequency	% (n = 56)
Interested in visiting a school garden	46	82.1%
Interested in volunteering at a school garden	33	58.9
Interested in taking classes at a school garden	37	66.1
Knew school has access to a garden	37	66.1
Had visited the school garden	10	17.9
Child had learned new information from the garden	1	1.8
Parent had learned new information from the garden	9	16.1

Table 6. Annex Questions—Rongko

	Frequency	% (n = 62)
Interested in visiting a school garden	57	91.9
Interested in volunteering at a school garden	44	71.0
Interested in taking classes at a school garden	56	90.3
Knew school has access to a tech park	21	33.9
Had visited the tech park	9	14.5
Child had learned new information from the tech park	16	25.8
Parent had learned new information from the tech park	8	12.9
Wanted a school garden implemented	59	95.2

25.8% of parents stating that their child learned new farming techniques from the tech park. Knowledge transfer to parents was also low, with 12.9% of parents reporting having learned new farming techniques from the tech park.

Key Informant Interview Results

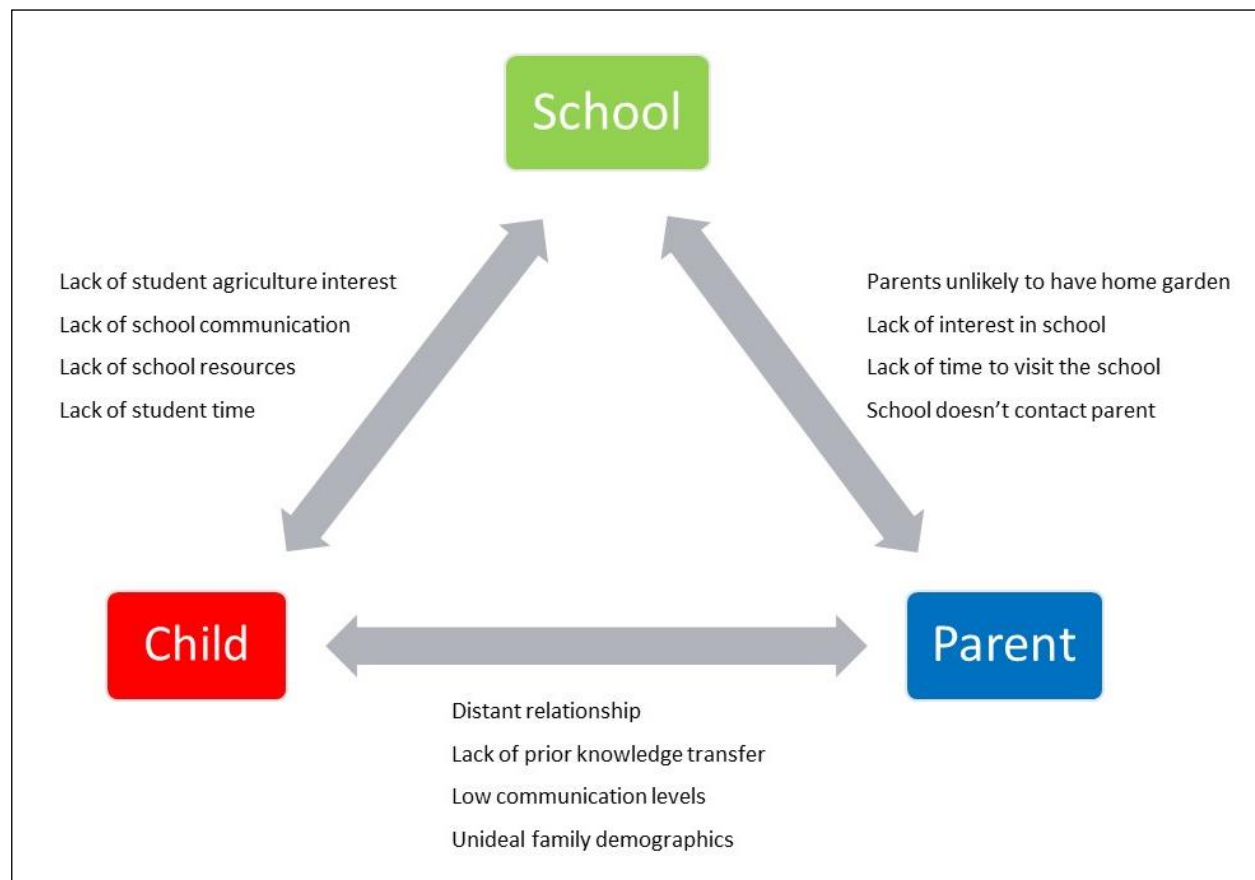
Using a grounded theory approach, key informant interview data was categorized through three coding rounds to develop an overarching theory on the potential of scaling SI technologies to parents through school gardens in Cambodia. From interview responses, it was found that scaling potential is dependent upon child-school relationships, parent-child relationships, and parent-school relationships. For each relationship pair, knowledge, actions, and dispositions predict scaling success. As a whole, these create a framework of key barriers to and opportunities for scaling SI technologies through school gardens. Thus, this research theo-

rizes that if the opportunities for scaling can be leveraged and the barriers to scaling minimized, there is a high likelihood that SI technologies can be scaled from school garden to home farm in Cambodia.

Barriers to Scaling

When it comes to key barriers to scaling, specific relationship factors were particularly influential (Figure 2). Concerning child-school relationships, the strongest barriers to scaling were a lack of student interest in agriculture, a lack of student time, a lack of school communication, and a lack of school resources. Parents, principals, and teachers all noted a lack of agriculture interest from a certain subset of students. One guardian at Sampov (Sampov, Parent 1) stated regarding her nephew who lives with her, “[My nephew] is not interested in agriculture. It is hard work, and the young generation doesn’t see agriculture as a good career.”

Figure 2. Barriers to Scaling Between Schools, Schoolchildren, and Parents through School Gardens



Additionally, the principals and teachers at each school indicated that for a school garden to succeed, the school would need more financial and human resources. A teacher at Rongko (Rongko, Teacher1) stated, “First, we need to have a plan. There should also be a key person and a budget to run [the garden]. We also need to take time to train the people who want to do it and learn agriculture.” As the teacher noted, without proper financial and programmatic planning support, success of the garden and transfer of knowledge to parents will be limited.

As for guardian-child relationships, barriers to scaling included a distant relationship between child and guardian, a low level of communication, a lack of prior knowledge transfer experiences, and unideal family demographics. These barriers were particularly discernible when interviewing the parents who had been identified as having low involvement based on prior survey responses. One parent at Banan (Banan, Parent 1) stated of her relationship with her sons, “The children just come home from school to eat and then they go off. They don’t spend much time at home with the family. They come to eat and ask for money for materials to study.” Likewise, one guardian stated of her nephew, “We are not very close. We only talk a little when we eat breakfast together before he leaves for school. He mainly stays in his room” (Sampov, Parent 1). Both of these individuals also claimed that they had never learned anything new from the high-schoolers.

These responses are worth noting, as a weak parent-child relationship prior to school garden implementation will hinder knowledge transfer to the parent (Pekarcik & Ader, 2021). If communication is low and the relationship is strained between a parent and a child, their willingness to learn and share from one another will also be diminished. Furthermore, unideal family demographics can contribute to low likelihood of scaling. The term “unideal” encompasses a range of factors not specifically measured in survey responses but gathered from key informant interviews as being a limiting factor to scaling. This included anything from parent occupation to number of children in the household to the amount of arable land available on the household

property. For instance, some households had absent parents or a high number of children, resulting in a low likelihood of child-parent communication. Other households had no farming background or access to land that would provide a need or opportunity to learn from a school garden. For example, one household in Banan was solely made up of medical professionals and indicated their son is likely to become a doctor as well (Banan, Parent 2). As such, although they have high involvement in their son’s life, their interest in and likelihood of learning from a school garden was low.

Looking at parent-school relationships, barriers to scaling included a lack of parent interest in the school, a lack of time to visit the school, a lack of contact from the school, and a low likelihood of the parent having a home garden. One parent (Sampov, Parent 2) highlighted many of these barriers stating, “I am busy, and the school has never called me to ask me to go. No one helps me at the farm because my children prioritize their studies, so I am very busy doing all the rice farming on my own.” Interestingly, the claim from some parents that the school does not contact them conflicted with principal and teacher statements that they contact parents regularly for ceremonies and parent-teacher meetings. A teacher from Banan (Banan, Teacher1) stated that the school contacts parents in one of three ways: calling the parents directly, having the student tell the parents to come, or contacting the chief of the village to find the parents and invite them. However, based on parent responses, it is clear there is a gap between school and parent communication, particularly for rural parents who lack cell phone access.

Finally, a parent not possessing a home farm or garden presented a barrier to the parent-school relationship. If a parent is unable to establish a home garden or uninterested in establishing one, there will be a very low likelihood of them adopting SI technologies, thus limiting scaling potential. Factors contributing to a lack of home garden implementation included no agricultural land, poor soil and water resources, low interest in agriculture, and old age.

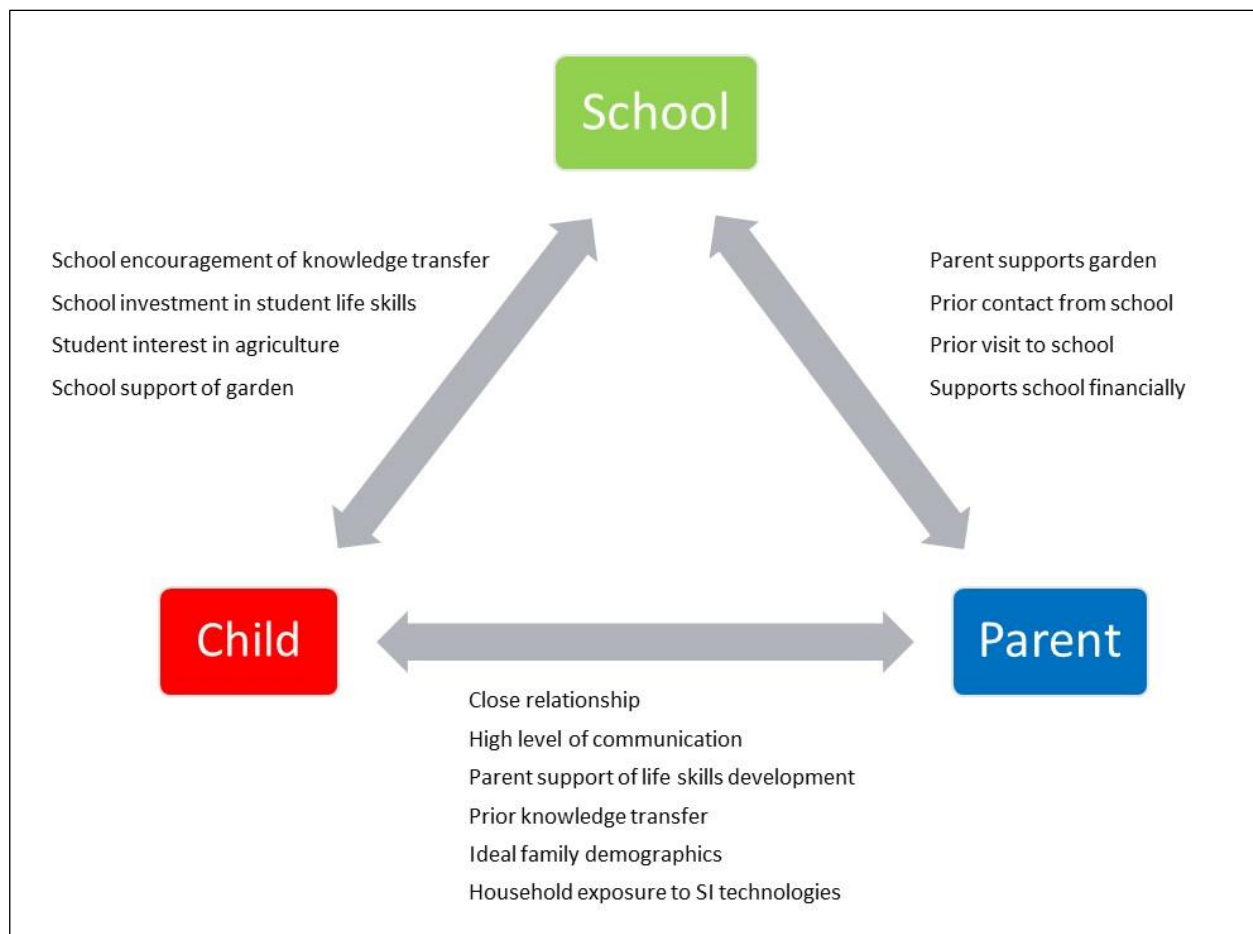
Opportunities for Scaling

When it comes to key opportunities for scaling, specific relationship factors between the parent, child, and school were particularly beneficial (Figure 3). Concerning child-school relationships, opportunities for scaling included school support of garden, school investment in student life skills development, and student interest in agriculture. A strong predictor of success was whether the school had buy-in from leadership, access to necessary resources, a plan in place, and the desire to see students gain life skills from the garden. Additionally, if students had a high level of interest in agriculture, they were more likely to be actively involved in school garden activities. The greater their involvement in the garden, the more likely the students were to share this information at home. The principal at Sampov particularly exemplified these

positive drivers. At the time of the interview, which coincided with the planting of garden, he already had identified a pilot class of 15 students and had set up a calendar schedule for the students to work in the garden and participate in agriculture classes. This school support was supplemented by sufficient student interest in the program at Sampov. The principal stated that when he proposed the idea of having a school garden to his class of 43 students, 20 of them were interested in being involved and learning more about agriculture. The support of the principal and interest of the students indicates a strong opportunity for successful scaling at Sampov.

Looking at parent-child relationships, opportunities for scaling included close relationships between the child and the parent/guardian, high levels of communication, parent support of life

Figure 3. Opportunities for Scaling Between Schools, Schoolchildren, and Parents through School Gardens



skills development, prior instances of knowledge transfer, previous exposure to SI technologies, and ideal family demographics. Close relationships and high communication levels between the child and parent/guardian were prevalent among the parents identified as highly involved and average. A grandfather in Banan (Banan, Parent 3) stated,

I am close with my granddaughter, and I share knowledge with her. I tell her all about social life. . . . I help her with her schoolwork when she doesn't understand. When she comes home from school, she tells me about what she has learned, and I teach her more about history.

Close relationships and high levels of communication are indicators that the child will discuss at home what they are learning at school and thus increase likelihood of SI technology scaling. Additionally, from the above household and others, there was evidence of prior knowledge transfer indicative of further information-sharing and adoption. The same grandfather (Banan, Parent 3) shared that, "[My granddaughter] told me about the WFP at the school, and I told her to get involved and help at the WFP garden." Likewise, a parent at Rongko (Rongko, Parent 3) stated that her sons taught her how to use the telephone and computer. These examples show that parents believe in learning from their children and suggests that parents will also be able to learn agricultural techniques from them. Furthermore, there were "ideal" family demographics that provided opportunities for scaling, such as household members being farmers and the household having a smaller number of children. According to Rongko's principal, due to their rural location, about 90% of students come from farming families. Most of these parents are rice farmers and would benefit from exposure to vegetable farming. Right now, they import most of their produce from Battambang. There are key opportunities to scaling through these rural farming households, as they would benefit the most from SI technologies.

Concerning parent-school relationships, opportunities for scaling included prior contact from the school, prior visits to the school, parent

support of a school garden, prior donations to the school, and school encouragement of knowledge transfer. The primary avenues the school provides for parents to visit are the opening ceremony, awards ceremonies for high academic achievement, and parent-teacher meetings. Some parents also pick their children up from school or visit for sporting events. Responses suggest that if parents are directly invited for specific event, they are more likely to come, even if they live farther from the school. Although he is a rural farmer, the grandfather from Banan (Banan, Parent 3) stated that,

I went to visit the WFP garden at the school. I have also gone to parent-teacher meetings and the opening ceremony. It is not hard for me to visit the school, and I am happy to see the WFP garden at the school.

In addition, parental support of the garden was identified as a key opportunity for scaling. Most parents acknowledged their desire to see a garden at their child's school and an enthusiasm over the skills their child and they themselves will be able to learn from it. One parent from Sampov (Sampov, Parent 3) stated, "Yes, it will be very good. I am very happy that the school will have a garden because I love agriculture and growing crops. I will be happy to see the garden succeed and produce vegetables." Finally, some parents had invested in the school financially, and thus had a stake in seeing it succeed. According to the principal at Banan, "Parents support the school financially through items such as the back wall, the small road at the school, the seating area, and the flowers planted at the school." The evidence of parents support prior projects suggests they would also be willing to financially support the garden and enhance scaling success.

Discussion

Parental Involvement in Educational Activities

Overall, slightly fewer than half of parents surveyed (43%) had visited their child's school. An even smaller percentage of parents had volunteered or worked at the school. Yet, of the parents who hadn't visited, the majority (71.3%) claimed they

wanted to visit the school. Additionally, results across schools suggested that parents generally had a strong interest in implementing, visiting, and volunteering at a school garden (Tables 4–6). This indicates that there is likely a disconnect between parents' desire to be involved in their child(ren)'s school activities and the opportunities that are provided for them to do so. This gap is highlighted by the discrepancies between principals' and teachers' claims of ample opportunity for parental school involvement and actual responses from parents. With the implementation of the school gardens, there is potential for this gap to be closed and involvement standardized across households, particularly if the curriculum includes parent and community education. Concerning involvement in experiential learning activities at the school, parental awareness and engagement is present but limited. Only 34% of parents at Rongko were aware that the school has access to a tech park, and fewer than 15% have visited it. As for Sampov, 66% of parents were aware that the school has access to a school garden, and just under 18% had visited the school garden project. That being said, it is worth noting that both the tech park and school garden are both located off-campus, limiting access to and awareness of these life skills development opportunities.

Generally, parents' involvement in their children's schools and lives varied between regions, with the location of the households influencing family social ties and parents' proximity to the school. Of the three schools, Rongko had the lowest percentage of parents who had visited the school, at 35.5%, while Sampov had the highest, at 50%. Rongko and Banan both had noticeably higher rates of weekly and daily parent-child communication than Sampov (Table 8). This is likely due to rurality, as most households in Rongko are located a greater distance from the school building, and the majority of residents in the commune where the school is located are rice farmers. Conversely, Sampov is located in a peri-urban commune and is the school situated closest to Battambang city. According to principal and teacher estimations, anywhere from 50 to 80% of students at Sampov come from farming families, as opposed to an estimated 90–95% of students at

Rongko. Banan is in the middle, with 70–75% of students coming from farming families.

Parent Willingness to Learn from Children

Results indicate parents are actively involved in their children's lives (Table 3). Parents' perceived willingness to learn about new agricultural technologies from their child(ren) was promising. The majority of parents believe they can learn from their child, discuss with their child what they are learning at school, and have a significant conversation at least once per week (Table 3). Furthermore, there was evidence that parents have learned general agricultural information from their child's school in the past, though this transfer of knowledge was limited. At Rongko, 13% of parents claimed they had learned new agricultural techniques from the technology park. Similarly, 16% of parents at Sampov claimed they had learned new farming techniques from the accessible school garden. Although they did not have prior agricultural activities to learn from, 58% of parents at Banan claimed that they had learned new information from their child sharing what they have learned at school. This indicates that classroom-based knowledge, attitudes, and practices have and can be adopted at parents' homes and suggests the child may have played a role in that knowledge diffusion. While the limitations of past knowledge transfer were not assessed in this study, it is worth noting that the technology park at Rongko was used as a COVID-19 quarantine site and thus has been inaccessible to the school since 2020. Additionally, it is of note that while most parents indicated that they have or can learn from their children, during key informant interviews, parents had a difficult time recalling a specific time their child had taught them something new. Furthermore, there was again a discrepancy between schools, with 74% of parents from Rongko believing they can learn new things from their child as opposed to 70% and 50% at Sampov and Banan, respectively. This may be due to location-specific family social-ties levels, as survey results suggest parent-child communication is stronger at Rongko than at Sampov and Banan. That being said, if the majority of parents believe that they can learn from their children, it is likely that scaling from children to parents through

school gardens is possible. This is a key finding as it relates to the overall S3-Cambodia project. If the relationship between parents, children, and schools isn't strong enough to facilitate knowledge transfer, key changes would need to be made regarding green lab implementation and the scaling pathway goals of the S3-Cambodia project.

Conclusion

This research sought to assess the feasibility of using school facilities and instruction as a pathway to scaling agricultural technologies. Overall, results suggest that students will discuss school garden activities at home and that the transfer of knowledge is possible. Not only are parent-child relationships strong enough to facilitate this bond, but prior knowledge dissemination from schools to parents suggests success. For instance, the fact that 66% of parents at Sampov knew about the prior garden is a strong indicator that there will be a similar level of awareness of the new garden. Further, parents at all of the schools indicated a strong desire for a garden to be implemented at their child's school and a high interest in visiting and volunteering at the school (Tables 4-6). The more that parents are involved in and visit the school

garden, the greater the scaling potential will be. Furthermore, S3-Cambodia green labs will likely be more conducive to scaling than prior experiential learning activities at the schools because knowledge transfer will be a key programmatic priority. For example, Rongko's technology park is not located on the school campus, making it more difficult for students and parents to interact with educational activities. The S3-Cambodia school garden will be located on the school campus, providing potential for more involvement and knowledge dissemination through direct daily interaction. Considering all of the above, if proper steps are taken to assure barriers to scaling are minimized, using school facilities and instruction as a pathway to scaling agricultural technologies in Cambodia is highly feasible.



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References

- Barrett, C. B., Carter, M. R., & Timmer, C. P. (2010). A century-long perspective on agricultural development. *American Journal of Agricultural Economics*, 92(2), 447–468. <https://doi.org/10.1093/ajae/aaq005>
- Calub, B. M., Africa, L. S., Burgos, B. M., Custodio, H. M., Chiang, S.-N., Vallez, A. G. C., Galang, E. I. N. E., & Punto, M. K. R. (2019). *The school-plus-home gardens project in the Philippines: A participatory and inclusive model for sustainable development* [Policy Paper 2019-1]. Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). <https://www.searca.org/pubs/briefs-notes?pid=430>
- Cramer, S. E., Ball, A. L., & Hendrickson, M. K. (2019). “Our school system is trying to be agrarian”: Educating for reskilling and food system transformation in the rural school garden. *Agriculture and Human Values*, 36, 507–519. <https://doi.org/10.1007/s10460-019-09942-1>
- Eng, S., Szmodis, W., & Mulsow, M. (2014). Cambodian parental involvement: The role of parental beliefs, social networks, and trust. *Elementary School Journal*, 114(4), 573–594. <https://doi.org/10.1086/675639>
- Feder, G., & Umali, D. L. (1993). The adoption of agricultural innovations: a review. *Technological Forecasting and Social Change*, 43(3–4), 215–239. [https://doi.org/10.1016/0040-1625\(93\)90053-A](https://doi.org/10.1016/0040-1625(93)90053-A)
- Ferguson, B. G., Morales, H., Chung, K., & Nigh, R. (2019). Scaling out agroecology from the school garden: The importance of culture, food, and place. *Agroecology and Sustainable Food Systems*, 43(7–8), 724–743. <https://doi.org/10.1080/21683565.2019.1591565>
- Food and Agricultural Organization of the United Nations (FAO). (2004). *School gardens concept note: Improving child nutrition and education through promotion of school garden programmes*. Special Programme for Food Security Handbook Series. FAO. <https://www.fao.org/3/af080e/af080e00.htm>

- Hought, J., Birch-Thomsen, T., Petersen, J., de Neergaard, A., & Oelofse, M. (2012). Biofuels, land use change and smallholder livelihoods: A case study from Banteay Chhmar, Cambodia. *Applied Geography*, 34, 525–532. <https://doi.org/10.1016/j.apgeog.2012.02.007>
- Islam, A., Ouch, C., Smyth, R., & Wang, L. C. (2017). The intergenerational effect of Cambodia's genocide on children's education and health. *Population and Development Review*, 43(2), 331–353. <https://doi.org/10.1111/padr.12047>
- Jack, B. K. (2013). *Market inefficiencies and the adoption of agricultural technologies in developing countries*. Agricultural Technology Adoption Initiative, J-PAL (MIT), and CEGA (UC Berkeley). <https://escholarship.org/uc/item/6m25r19c>
- Kassie, M., Teklewold, H., Jaleta, M., Marennya, P., & Erenstein, O. (2015). Understanding the adoption of a portfolio of sustainable intensification practices in eastern and southern Africa. *Land Use Policy*, 42, 400–411. <https://doi.org/10.1016/j.landusepol.2014.08.016>
- Leuven, J. R. F. W., Rutenfrans, A. H. M., Dolfin, A. G., & Leuven, R. S. E. W. (2018). School gardening increases knowledge of primary school children on edible plants and preference for vegetables. *Food Science & Nutrition*, 6(7), 1960–1967. <https://doi.org/10.1002/fsn3.758>
- Martin-Shields, C., & Stojetz, W. (2018). *Food security and conflict: Empirical challenges and future opportunities for research and policy making on food security and conflict* (FAO Agricultural Development Economics Working Paper 18-04). FAO. <https://www.fao.org/agrifood-economics/publications/detail/en/c/1156947/>
- Musumba, M., Grabowski, P., Palm, C., & Snapp, S. (2017). *Guide for the sustainable intensification assessment framework*. Feed the Future. <https://doi.org/10.2139/ssrn.3906994>
- National Institute of Statistics (Cambodia). (2019). *General population census of the Kingdom of Cambodia 2019: National report on final census results*. <http://nis.gov.kh/nis/Census2019/Final%20General%20Population%20Census%202019-English.pdf>
- Okiror, J. J., Oonyu, J., Matsiko, F., & Kibwika, P. (2011). Can schools offer solutions to small-scale farmers in Africa? Analysis of the socioeconomic benefits of primary school agriculture in Uganda. *Journal of Agricultural Education and Extension*, 17(2), 135–151. <https://doi.org/10.1080/1389224X.2011.544454>
- Pekarcik, G & Ader, D. (2021). School Gardens as a Method of Scaling up Sustainable Technologies: A Review. *International Journal of Environmental and Rural Development*, 12(2), 26–36.
- Petersen, B., & Snapp, S. (2015). What is sustainable intensification? Views from experts. *Land Use Policy*, 46, 1–10. <https://doi.org/10.1016/j.landusepol.2015.02.002>
- Pretty, J. (2018). Intensification for redesigned and sustainable agricultural systems. *Science*, 362(6417), Article eaav0294. <https://doi.org/10.1126/science.aav0294>
- Pretty, J., & Bharucha, Z. P. (2014). Sustainable intensification in agricultural systems. *Annals of Botany*, 114(8), 1571–1596. <https://doi.org/10.1093/aob/mcu205>
- Ramirez, A. (2013). The influence of social networks on agricultural technology adoption. *Procedia – Social and Behavioral Sciences*, 79, 101–116. <https://doi.org/10.1016/j.sbspro.2013.05.059>
- Ran, S., Kobayashi, K., Siri Wattananon, L., Mihara, M., & Ngo, B. (2013). *Promoting sustainable agriculture in Samroung Commune, Prey Chhor District, Kampong Cham Province through network of RCE Greater Phnom Penh*. Global RCE Network. https://www.rcenetwork.org/portal/sites/default/files/global_conf/RCE%20Greater%20Phnom%20Penh.pdf
- Ratcliffe, M. M., Merrigan, K. A., Rogers, B. L., & Goldberg, J. P. (2011). The effects of school garden experiences on middle school-aged students' knowledge, attitudes, and behaviors associated with vegetable consumption. *Health Promotion Practice*, 12(1), 36–43. <https://doi.org/10.1177/1524839909349182>
- Schreinemachers, P., Ouedraogo, M. S., Diagbouga, S., Thiombiano, A., Kouamé, S. R., Sobgui, C. M., Chen, H.-P., & Yang, R.-Y. (2019). Impact of school gardens and complementary nutrition education in Burkina Faso. *Journal of Development Effectiveness*, 11(2), 132–145. <https://doi.org/10.1080/19439342.2019.1624595>
- Schreinemachers, P., Rai, B. B., Dorji, D., Chen, H., Dukpa, T., Thinley, N., Sherpa, P. L., & Yang, R. (2017). School gardening in Bhutan: Evaluating outcomes and impact. *Food Security*, 9, 635–648. <https://doi.org/10.1007/s12571-017-0673-3>

- Shapiro, H. G., Willcox, A. S., Ader, D. R., & Willcox, E. V. (2021). Attitudes towards and relationships with cave-roosting bats in northwest Cambodia. *Journal of Ethnobiology*, 41(1), 87–104.
<https://doi.org/10.2993/0278-0771-41.1.87>
- Shilomboleni, H., & De Plaen, R. (2019). Scaling up research-for-development innovations in food and agricultural systems. *Development in Practice*, 29(6), 723–734. <https://doi.org/10.1080/09614524.2019.1590531>
- Sprague, P. (2016). *Instructional school gardens: Opportunities for and barriers to scaling* [Doctoral dissertation, Duquesne University]. Duquesne Scholarship Collection. <https://dsc.duq.edu/etd/30/>
- Tabucanon, M. T., & Mihara, M. (2016). Bridging sustainable agriculture and education for sustainable development. *International Journal of Environmental and Rural Development*, 7(1), 1–5. https://doi.org/10.32115/ijerd.7.1_1
- Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the “theory” back into grounded theory: Guidelines for grounded theory studies in information systems. *Information Systems Journal*, 20(4), 357–381.
<https://doi.org/10.1111/j.1365-2575.2009.00328.x>
- Westermann, O., Förch, W., Thornton, P., Körner, J., Cramer, L., & Campbell, B. (2018). Scaling up agricultural interventions: Case studies of climate-smart agriculture. *Agricultural Systems*, 165, 283–293.
<https://doi.org/10.1016/j.agsy.2018.07.007>
- Zurek, M., Keenlyside, P., & Brandt, K. (2015). *Intensifying agricultural production sustainably: A framework for analysis and decision support* [Project paper]. Climate Focus, International Food Policy Research Institute.
<https://ebrary.ifpri.org/digital/collection/p15738coll2/id/130125>

COVID-19 and Pennsylvania farmers: Financial impacts, relief programs, and resiliency strategies during the 2020 growing season

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Abstract

This article reports the findings of a multimethod study of the financial impact of the COVID-19 pandemic on Pennsylvania (PA) farmers during the 2020 growing season. Previous research on resiliency and the food system has encouraged exploring ways to describe the agency and adaptability of farmers as they respond to changing conditions. Further, the research has documented the ways

that governments intervene to maintain the overall structure of the food system. This study utilized a three-part framework that focused on (a) understanding the impact of the pandemic on PA farmers, (b) describing farmer adaptation strategies and direct-to-consumer marketing practices, and (c) documenting federal relief program participation. The project included an anonymous survey of more than 300 farmers and semi-structured inter-

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views with a subset of 16 farmers. Based on the findings from the survey, under half (42%) of farmers reported a loss of revenue, while over half reported either no change or an increase in revenue in 2020. We also found that vegetable farmers fared slightly better than livestock/dairy farmers; those with a higher pre-COVID revenue did better than those with a lower pre-COVID revenue; and farms that were able to increase direct-to-consumer sales maintained or increased their total revenues. About half of the farmers surveyed participated in federal aid programs, yet a portion of small farms indicated they did not know whether they qualified for this funding. We discuss the unprecedented scale of federal aid to farmers in 2020 and the remaining access gaps for smaller farmers. Additionally, we discuss the potentially protective role of direct-to-consumer sales for enhancing the resilience of regional food systems.

Keywords

COVID-19, Pandemic, Agriculture, Regional Food Systems, Relief Programs, Direct to Consumer, Adaptation

Introduction

According to national headlines, the COVID-19 pandemic wreaked financial havoc on U.S. farmers during the 2020 season. Jackson-Smith and Veisi (2021) analyzed news articles and trade journal publications from March 2020 to March 2021 and found that a majority of the portrayals in media, particularly early on, emphasized negative impacts of the pandemic on farmers and the role of institutions in addressing these impacts. Their study also found portrayals of more adaptive and transformative responses to the ever-changing conditions that faced farmers during this first full season of the pandemic. One example of more adaptive or potentially transformative responses to shifting markets and consumer behavior included nationwide reports that community supported agriculture (CSA) memberships were booming and replacing lost revenue for some farmers early in the pandemic (Ricker & Kardas-Nelson, 2020; Shilton, 2020; Westervelt, 2020). Many farmers made suc-

cessful adaptations during the height of the pandemic by increasing direct-to-consumer (DTC) sales. For example, Richards and Vassalos (2021) surveyed consumers in South Carolina and found that COVID-19 triggered an increase in demand for local meats during the 2020 season, though they also found uncertainty about consumer demand for local meats as pandemic conditions changed. The U.S. Department of Agriculture (USDA) Economic Research Service (ERS) review of the disruptions in food purchasing in 2020 supports this finding about the increase in DTC sales (Zeballos & Sinclair, 2021). The USDA ERS found an 11.1% increase in consumers' direct purchases from farmers, manufacturers, and wholesalers, although it was unclear whether this trend was due to consumers avoiding crowded supermarkets or because products were unavailable at common retail outlets (Zeballos & Sinclair, 2021). On the other hand, COVID-19 added to the pre-existing issues faced by farmers. As USDA Chief Economist Robert Johansson (2020) argued, farmers were already facing financial hardships due to the challenges posed by a global food system focused on large-scale suppliers. These challenges included international trade tariffs in 2019 and the worsening impacts of climate change, such as hurricanes, drought, and excessive rainfall that destabilized markets and impacted planting and harvest seasons.

Pennsylvania (PA), in the northeast United States, is home to 53,157 farms (USDA National Agricultural Statistics Services [NASS], n.d.-c). Of these, 88% meet the USDA's definition of a small farm as they sell less than US\$250,000 of agricultural product annually (Kelsey et al., 2021; USDA National Institute of Food and Agriculture, n.d.). Despite the preponderance of small farms, PA agriculture supports one out of 10 jobs and contributes \$1 out of \$16¹ in gross state product (Econsult Solutions Inc., 2021). Row crops (hay, grains, and oilseed) and livestock (beef, dairy, and other) are PA's leading agricultural products (Kelsey et al., 2021). PA ranks eighth nationwide in milk production (Center for Dairy Excellence, n.d.) and 22nd in crop production based on sales, with

¹ All currencies in this article are US\$.

the fifth-highest number of fruit and vegetable farms in the U.S. (Econsult Solutions Inc., 2021). While half of the farm acreage in PA in 2017 was owned by farms selling less than US\$100,000 annually, the number of small and midsized PA farms has declined while the number of large farms (those with annual sales over US\$500,000) has increased over the past few years (Econsult Solutions Inc., 2021).

This multimethod study was designed by Chatham University faculty and staff from Pasa Sustainable Agriculture, a nonprofit organization that supports area farmers. The purpose was to better understand the impact of the pandemic on Pennsylvania farmers during the 2020 growing season with a specific focus on (a) describing the impact of the pandemic on farmers in terms of revenues and marketing channels, (b) exploring the frequency and effectiveness of adaptive strategies such as DTC marketing that farmers enacted to insulate their businesses from the dynamic disruptions to food systems, and (c) determining the nature of participation in different relief programs by farms with different income levels and predominant products. The study provides insights from the farm owner/operator perspective regarding the nature of the financial resilience of farms of various sizes and commodity type, makes empirical arguments regarding the wide range of farmer experiences that extends beyond media representations, and helps describe the adaptive capacity of regional food system actors who relied on shorter supply chains during a time of major disruption to markets and supply chains in the food system.

Literature Review

A Resiliency Lens of Food Systems During the Pandemic

Hendrickson (2015) summarized some of the inherent vulnerabilities of a consolidated, industrial food system and examined the utility of a “resiliency lens” in the food system. The concept of resiliency was derived from ecological sciences but has also been applied in social science. It describes the capacity of a system to withstand shocks or disturbances while maintaining overall structure and function (Han & Goetz, 2015). Applying a

resiliency lens holds potential for understanding strategies for reducing risks for food systems during catastrophes like pandemics (Food and Agriculture Organization of the United Nations [FAO], 2013). Research on the impacts of COVID-19 on farmers has applied a resiliency lens to understanding the adaptive capacities of food businesses in Vermont (Whitehouse et al., 2023), the role of diversification for farms in Italy (Mastronardi et al., 2022), and supply chain maintenance for organic dairy farms in France (Perrin & Martin, 2021). Thilmany et al. (2021) described potential benefits of local and regional food systems and the supply chain relationships that enhanced DTC sales and minimized the disruptions experienced by national retailers, aggregators, and restaurants due to pandemic lockdowns.

Whitehouse et al. (2023) acknowledged some important limitations of the resiliency concept and referenced Borges-Méndez and Caron’s (2019) critique of the resiliency lens when applied to the government response to major disasters such as Hurricanes Irma and Maria in Puerto Rico (p. 2). Both of these works highlighted the ways in which the resiliency concept can perpetuate the overall system structures by focusing on government interventions. The authors called for more focus on local actors and their agency during these times of disruption. With regard to resiliency during the COVID-19 pandemic, Whitehouse et al. (2022) focused on documenting the adaptability of Vermont food businesses who were in the position to market foods directly to consumers during a time of major supply chain disruptions. In contrast, the COVID-19 pandemic generated government aid to help maintain overall food system function.

Federal Relief Programs

The agriculture sector in the U.S. has benefitted from federal support since the 1930’s through a variety of funding streams (USDA Farmer Services Agency [FSA], n.d.), but the COVID-19 pandemic created financial challenges and, subsequently, federal support unlike any seen in the recent past. Between 2000 and 2019, direct government payments to farm operations nationwide ranged between \$9.7 billion and \$24.3 billion annually

(USDA ERS, 2023). In PA, agriculture census data from 2012 and 2017 showed, respectively, that federal farm relief totaled \$86.4 million and \$74.1 million and was accessed by 27% and 21% of farmers (USDA NASS, n.d.-b). On March 27, 2020, Congress passed the Coronavirus Aid, Relief and Economic Security Act (CARES Act) to provide funds for food and nutrition programs as well as direct monetary relief to farmers and ranchers (Hungerford et al., 2021). By the close of 2020, direct government payments to farmers nationwide totaled \$45.6 billion (USDA ERS, 2023) with the majority (\$23.5 billion) provided by the Coronavirus Food Assistance Program (CFAP) and \$6 billion provided through the Payroll Protection Program (PPP; Giri et al., 2021). In PA, 38% of farmers and ranchers received federal support in 2020, totaling \$411 million (USDA Farmers.gov, n.d.-a; USDA Farmers.gov, n.d.-b). These relief payments aimed to mitigate the financial strains caused by price declines for agricultural product as well as cover financial losses due to COVID-19. The first iteration of this aid, the CFAP 1, was offered on May 21, 2020, providing funds to farmers suffering from price declines, while CFAP 2, implemented on September 1, 2020, based its payments on estimated financial losses (USDA Farmers.gov, n.d.-a; USDA Farmers.gov, n.d.-b). However, federal support may not have reached all

farmers in need. The smallest businesses are often unaware of available government assistance (Demko et al., 2021; Humphries et al., 2020), and smaller PA farmers often lacked a connection to loan and grant providers (Econsult Solutions Inc., 2021). Beyond the CFAP subsidy payments, the CARES Act increased available loan options by extending loan maturity from 9 months to 12 months for marketing assistance and by enabling the Small Business Association (SBA) through the PPP to offer forgivable loans to small businesses, including farmers and ranchers, to help them keep employees on the payroll (Giri et al., 2021; Hungerford et al., 2021). McEowen (2021) described how another SBA program, Economic Injury Disaster Loan (EIDL), a traditional loan program, was structured and described potential challenges of these loans for farmers. Table 1 summarizes these federal programs.

According to Hungerford et al. (2021) and Orden (2021), CFAP's structure worked best for livestock and row crop farmers compared to specialty (fruit and vegetable) farmers. Moreover, because federal relief payments, including CFAP, are based on the farms' usual production levels, not acres planted, larger-revenue farms tend to receive the majority of federal subsidy payments as well as a higher payment proportionately than smaller farms (Belasco & Smith, 2022). Bekkerman et al.

Table 1. Selected Relief Program Summary for the Agriculture Sector

Relief Program	Coronavirus Food Assistance Program (CFAP)	Payroll Protection Program (PPP)	Economic Injury Disaster Loan (EIDL)
Description of relief program	Funded by the CARES Act in 2020, provided grants to producers of agricultural commodities who suffered sales losses and/or had increased marketing costs associated with the pandemic. ^a	Funded by the CARES Act in 2020, provided emergency forgivable loans to eligible farmers to keep their workforce employed during the height of the pandemic. ^c	Funded by the CARES Act in 2020, provided low-interest fixed-rate long-term loans to farmers to support recovery from the pandemic's economic impact. ^d
Application process	Eligibility criteria and application form available online. Local Farm Service Agency (FSA) could provide in-person assistance. ^a	Managed by the Small Business Association (SBA) and accessed through SBA-affiliated lenders.	Managed by the Small Business Association (SBA) and accessed through SBA-affiliated lenders.
Amount of federal funding	US\$23.5B nationwide in 2020 through CFAP 1&2 ^b	US\$6B ^b	Included in PPP funding calculation ^b

^a USDA FSA, 2020, ^b Giri et al., 2021, ^c Ludwig, 2021, ^d SBA, 2021

(2018) noted that disaster funding, like CFAP, often goes to farmers already receiving other federal support payments such as Agriculture Risk Coverage or Price Loss Coverage.

Previous research on resilience and the food system (FAO, 2013; Hendrickson, 2015; Whitehouse et al., 2023) has encouraged focusing simultaneously on a) describing the agency and adaptability of smaller farmers who may be more flexible to respond to changes and b) understanding the ways that government agencies may intervene to maintain the overall structure of the food system. This resiliency lens influenced the overall design of the study to allow for an empirical exploration of the adaptations that farmers enacted during the 2020 growing season and of the types of farmers able to participate in federal relief programs. The present study further explored the extent to which DTC marketing during the first year of the pandemic provided potentially insulated farmers from the financial impacts of the pandemic. This study included a more robust sample size than previous studies and qualitative and quantitative empirical data to learn more about the factors impacting their flexibility and adaptive capacity. Additionally, our study examined the ways in which federal aid programs may have played a role in providing stability for certain types of PA farmers.

Methods

The objectives of this multimethod study (Bell et al., 2020) were to (a) gain more insight into the impact of the pandemic on PA farmers during the 2020 growing season, (b) understand more about federal relief program participation, and (c) explore strategies farmers utilized to adapt to changing conditions. We conducted a cross-sectional survey and semi-structured interviews to further describe the impact of the pandemic on farmers, explore the potentially protective effects of adaptations such as direct-to-consumer marketing, and document farmers' experiences participating in federal relief programs. We describe this as a multimethod approach that allows for statistical analysis of responses across our sample and an in-depth exploration of experiences of farmers navigating the first year of the COVID-19 pandemic. Both Pasa Sustainable Agriculture and Chatham Uni-

versity are located in PA, have a longstanding focus on PA farmers, and worked together to design and implement this study. A selection of quantitative and qualitative data was analyzed for this paper, which was part of a larger effort to understand the initial impacts on and needs of farmers during this time of major upheaval in the food system. The data and analysis presented in this study use a resiliency lens to explore differences farmers encountered during the pandemic and the possibly protective role of DTC marketing for financial resiliency and understand more about who was able to participate in financial relief. The ultimate goal was to understand the long-range impacts of government funding and the food system. This study was approved by Chatham University's Institutional Review Board on December 6, 2020, as Expedited Research.

Instrument Development

After exploratory email conversations about the issues in June 2020, the team met virtually in July 2020 with the goal of designing a study to capture the impact of COVID on PA farmers. The team planned to distribute a survey in late 2020 or early 2021 to provide a yearlong look at farmers' COVID-related experiences, adding to the literature that, at that time, had focused only on the first few months of the pandemic. Thus, developing the survey tool was time-sensitive, and we sought previously developed questions instead of creating and testing new ones. We chose Pasa's financial benchmark survey as the initial guide (Egan & Bay Nawa, 2021). The financial benchmark survey began collecting financial data from direct-marketing vegetable farmers in 2017 and continues to be administered annually. Therefore, our COVID-centric survey would have context and add crisis-related detail to the financial information collected by Pasa. However, the Pasa survey, with its focus on vegetable farmers, was too narrow for our purpose of describing COVID's impact on PA farmers regardless of product. An online search identified the Carolina Farm Stewardship Association report by McReynolds (2020), which provided a snapshot of the pandemic's impact on farmers with annual incomes of less than \$250,000, a group consistent with the majority of PA farmers. There-

fore, our survey questions were closely aligned with these two surveys and covered a variety of topics, many of which are outside the scope of this analysis. The survey instrument (see Appendix A) was developed in electronic and paper form and began with farmer demographic questions, for example, zip code, total acres, and predominant output, which mirrored the Pasa financial benchmark survey. Clarifying for the farmers that the survey was seeking changes *due to* COVID-19, it then focused on several domains, three of which are addressed in this paper:

1. **Financial impacts of the pandemic** sought to identify the PA farmers' financial experiences by asking about pre-COVID and 2020 farm revenue.
2. **Relief program participation** questioned the extent to which PA farmers participated in federal agriculture relief (CFAP and PPP) and their challenges, if any, in doing so.
3. **Adaptation strategies** questioned marketing channels to ascertain whether farmers adopted or increased DTC sales as indicated in the literature.

The survey also elicited demographic information such as race, gender, and age. The survey included a set of Likert scales, binary responses, checklists, and open-text boxes.

Survey: Sampling and Recruitment

While designing recruitment strategies for the survey and interviews, the research team realized that there was not an up-to-date sampling frame for farmers/producers in the state nor a way to access contact information for PA's over 53,000 farms. To reach the widest number of farmers with the financial resources available, the team developed an electronic and a paper survey but focused primarily on the dissemination of the web-based survey on the Qualtrics platform. Given the lack of an accessible, comprehensive database of PA farmers, we utilized a network of 11 farm-related organizations active in the state, including the PA Farm Bureau. We distributed a link to the survey through their email lists, which collectively totaled over 20,000

farmers. Eligible organizations served PA farmers, were willing to share their list-serve count, and agreed to send our IRB-approved email containing the survey link in January and February 2021. Additionally, Pasa Sustainable Agriculture used the US Postal Service to mail the survey to 200 farmers known to them as preferring hard-copy communication. Eligible participants were required to a) be at least 18 years of age and currently a farmer, b) have a farm located in Pennsylvania, and c) meet the USDA (2021) definition of a farm: \$1,000 or more of agricultural products produced and sold, or normally sold, during the year. Before starting the survey, participants were provided with the purpose of the study and information regarding their voluntary participation and their right to withdraw from the study with no negative consequences. Participants were offered an opportunity to enter a drawing for a \$50 gift card as an incentive for completing the survey through a link that separated their identifying data from their survey responses. For online surveys, participants were asked to confirm their consent. For paper surveys, participants were asked to disregard the survey if they chose not to participate.

Semi-Structured Interviews: Sampling and Recruitment

At the end of the electronic and paper surveys, farmers were given the option to voluntarily share their contact information, the zip code of their farm, and the farm type (vegetable, livestock, etc.) for participation in a qualitative, semi-structured interview. If selected for the interview, they would receive a \$100 gift card. Sixty-two farmers expressed interest in being interviewed. In an effort to interview a representative sample from the state, we chose the number of farmers to interview by region based on how farmers are distributed across PA. Our research partner, Pasa Sustainable Agriculture, divides the state into four agricultural regions (Figure 1) based on roughly similar geography and Pasa's ability to provide educational events to area farmers. For each of these four regions, we determined the number of farms and their percentage of PA's total farms (Table 2).

Because we purposefully could not connect the survey information with the farmer, we used the

zip code and farm type of farmers willing to be interviewed and other information publicly available from farm websites to narrow the list of interviewees. The western, south central, and eastern regions contain 26%, 29%, and 28% of PA farms, respectively. The north central region has 16% of the farms. For each region, we chose a mix of smaller and larger farms (by acreage) as well as farm types that were predominately specialty crops (fruits/vegetables) and livestock. The distribution of the interviewed farms from each region is shown in Table 2.

Survey Analysis

Our first research objective was to explore the financial impacts of COVID on different types of farms (i.e., dairy/eggs/livestock, hay/forage/row crop/grain, and fruit/vegetable/specialty farms). We examined the participants' estimated changes in revenue due to the COVID-19 pandemic and whether participants' change in revenue was related to their typical (pre-2020) yearly farm revenues. Next, a one-way analysis of variance (ANOVA) was conducted to investigate the differences in the COVID-related financial impact across different farm types. The one-way ANOVA tested whether there is a difference in the population means using the sample data. This statistical approach is appropriate for exploring the relationship between a categorical predictor and a continuous variable (Huck, 2012). In this study, we used the different farm types as the independent variable and the COVID-related revenue change as the dependent variable in the ANOVA.

Our second research objective was to explore to what extent

surveyed farmers were able to benefit from federal relief programs. We examined the percentage of participants who participated in any COVID-19-related farm or small business relief programs during 2020 and examined the reasons they may not have participated in relief programs. We also analyzed whether farmers' participation in these relief programs was related to their typical (pre-2020) yearly farm revenues and the predominant farm product. A Chi-square test was conducted to explore these relationships.

Our third research objective was to investigate to what extent the farmers were able to benefit from implementing adaptation strategies in their businesses. We examined the percentage of participants who implemented DTC strategies and enhanced online promotion practices. We also examined whether different levels of business adaptation would be related to changes in farm revenue. A one-way ANOVA was conducted to compare farm revenue change across different levels of adaptation (i.e., decreased, maintained, increased) in DTC strategies and online promotion practices separately.

Figure 1. The Four Regions of Pennsylvania and Outlined Counties

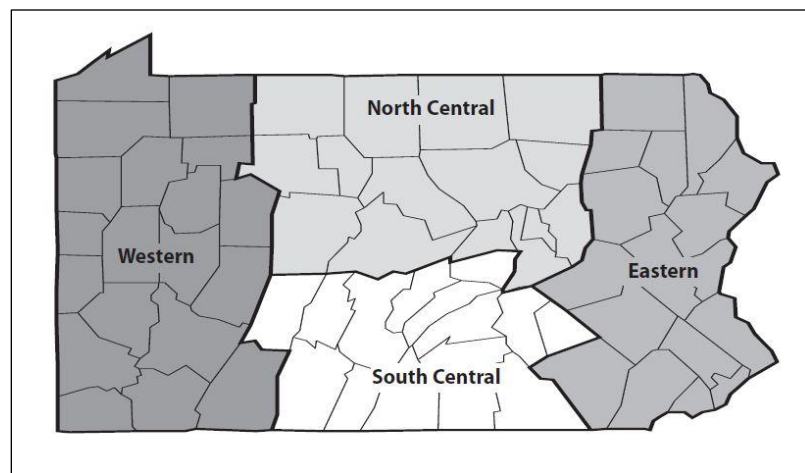


Table 2. Number of Farms in Pennsylvania Regions and Distribution of Interviewees in These Regions

Pennsylvania Region	Western	South Central	Eastern	North Central	Total
Number of farms	13,958	15,522	14,740	8937	53,157
Percent of total farms	26%	29%	28%	17%	100%
Number of volunteers	33	11	13	5	62
Number of interviews	5	5	4	2	16

Semi-Structured Interviews Analysis

The semi-structured interviews were conducted and recorded via Zoom. The semi-structured interview protocol is presented in Appendix B. It was developed by the research team utilizing a similar framework to the survey, which focused on learning more about farmer experiences during the pandemic related to financial impacts, federal relief program participation, and noteworthy adaptation strategies. The interviews were transcribed using Otter.ai and analyzed using the following major domain areas: factors impacting operations in 2020, experiences with federal relief programs, and direct-to-consumer adaptation strategies. The transcripts were coded first by the interviewer using these domains and then later by a member of the research team who had not conducted the interview. Representative quotations or unique perspectives were identified from these domain areas, edited for clarity, and used to further elaborate upon related findings from the quantitative study. The perspectives from the interviews helped confirm and/or offer nuance to findings in the quantitative analysis and represented farmers' experiences navigating the pandemic and federal relief programs.

Results

Survey and Semi-Structured Interview Participants

The survey was closed on April 6, 2021, with responses from 492 farmer owner-operators, of whom 318 met our inclusion criteria. We removed responses from 12 farmers who did not have a farm within PA, 14 who had not produced or sold \$1,000 or more of agricultural products in the previous year, and 148 respondents who completed less than half of the survey. Even though the nature of our recruitment yielded a low response rate, we found that respondents were representative of farmers across all regions of PA and aligned with the most recent demographic profile from the Pennsylvania Department of Agriculture in terms of race/ethnicity, gender, and age, with an overrepresentation of large farms (based on revenues) in the sample (Table 3). The majority (96%) were for-profit farms, and 83% of our respondents were

from rural areas. Additionally, the respondents reflected a range of predominant farm outputs, shown in Table 3. The characteristics of farmers selected for the semi-structured interviews is shown in Table 4.

Financial Impacts of the Pandemic

Farmers' responses to our survey revealed a mixed picture of the impacts of COVID-19 on Pennsylvania farm revenues in 2020. Less than half of farmers (42%, $n=125$) reported a negative revenue change; 21% ($n=63$) reported no change; and 37% ($n=110$) saw a positive change in revenue due to the pandemic compared to previous years. This data was self-reported and based on the farmers' estimates of their farm revenue during 2020. The degree of the negative and positive financial impact varied, as shown in Table 5.

We further explored the farm characteristics to examine potential differences in financial outcomes. A Pearson's correlation coefficient was computed between pre-COVID revenue and revenue change. There was a weak but positive correlation, $r(298)=.17$, $p=.003$, between the two variables. This finding suggested that farmers who reported lower pre-COVID revenue were slightly more likely to report a COVID-related loss of revenue. This may have been related to higher rates of relief program participation for higher-revenue farms (discussed below in Figure 3).

A one-way ANOVA was conducted to compare farmers' ratings of revenue change across different types of predominant output. Levene's test of homogeneity suggested that the variances of farmers' ratings were not homogeneous. Therefore, a Brown-Forsythe test was conducted to provide robust test results. The results were significant, $F(2, 253)=5.18$, $p=.006$. Specifically, dairy/egg/livestock farmers reported a significantly lower gain ($M=4.40$, $SD=2.03$) than the fruit/vegetable/specialty farmers did ($M=5.21$, $SD=2.26$). This finding suggested that the fruit/vegetable/specialty farmers fared better than the dairy/eggs/livestock farmers, with the former reporting on average no change in revenue and the latter reporting a 1–10% revenue loss (Figure 2).

In our semi-structured interviews, one of the dairy farmers interviewed explained more about

their experiences in the 2020 growing season and explained both financial losses due to changing market pressures and a frustration with government programs that were too slow to prevent food waste:

We had a perishable product and we kind of sit on it. So that was sort of disappointing, just to see the milk go down the drain. And then you also know that there's people that need nutritious food because they were laid off. (Farmer Interview, 004)

Based on the data we collected, it is unclear why fruit/vegetable/specialty farmers may have

had reduced financial losses. However, a small-scale vegetable grower on 15-acres, without outside laborers and with a long-established CSA program summarized their growing year as follows:

They've been going really well. So maybe that's not what you've been hearing. But our business economically is doing better than ever. Because with the pandemic, people panic about where their food was going to come from. All of our marketing and all of our sales are through CSA, so we don't have any restaurant or wholesale accounts. And so we weren't affected by the restaurants closing. If anything, our sales went up because people were cooking

Table 3. Characteristics of the Survey Respondents and their Farms

	Survey Respondents Frequency (%) ^a	PA Farmers Frequency (%) ^{b, c}
Race/Ethnicity		
American Indian or Alaskan Native	0 (0%)	108 (0.1%)
Asian	1 (0.4%)	103 (0.1%)
Black or African American	1(0.4%)	80 (0.1%)
Native Hawaiian and Pacific Islander	0 (0%)	23 (0.0%)
White	258 (99.2%)	89,843 (99.3%)
Hispanic	5 (2%)	759 (1%)
Sex/Gender		
Female	87 (35%)	31,449 (35%)
Male	163 (64.6%)	59,012(65%)
Nonbinary	1	—
Age		
Average age (range)	53 (23–88)	54.9
Pre-COVID Farm Revenue		
<US\$1000	—	12,748 (24.0%)
US\$1,000–24,999	99 (33.4%)	21,054 (39.6%)
US\$25,000–49,999	46 (15.5%)	4437 (8.3%)
US\$50,000–99,999	41 (13.9%)	3570 (6.7%)
US\$100,000–249,999	46 (15.5%)	5056 (9.5%)
US\$250,000–499,999	26 (8.8%)	3205 (6%)
≤US\$500,000	38 (12.8%)	3087 (5.8%)
Predominant Farm Output		
Dairy/Eggs/Livestock	131 (44%)	—
Hay/Forage/Row Crop/Grain	64 (21%)	—
Fruit/Vegetable/Specialty	95 (32%)	—
Other	11 (4%)	—

Note. N=318.

^a The number of respondents for each variable ranges between 219 and 307 due to missing values. Farmers reporting revenues less than US\$1,000 were not included in this study.

^b Total: 53,157 farms and 90,461 total producers. (Data collected for a maximum of four producers per farm.) The demographic information used the total number of producers (USDA NASS, n.d.-c).

^c Farm revenue used the number of farms. The USDA reports market value of agricultural products, and we compare these values with the farm revenue of our respondents in this table (USDA NASS, n.d.-a).

Table 4. Characteristics of Semi-Structured Interview Participants

ID	Region	County	Acres	Products
002	Eastern	Lehigh	2	Organic vegetables, diversified livestock, other value-added products
004	Eastern	Berks	300	Dairy
006	North Central	Lycoming	1	Vegetables, herbs, flowers, livestock
008	North Central	Centre	9	Vegetables
009	South Central	York	4.5	Vegetables and fruit
010	South Central	Huntingdon	5	Organic vegetables
011	South Central	Juniata	25	Diversified vegetables, fruit, and livestock
012	South Central	Mifflin	110	Diversified livestock and education
013	South Central	Cambria	800	Dairy and dairy products DTC
014	Western	Jefferson	2	Organic vegetables, herbs, and edible flowers
015	Western	Fayette	3	Seedlings and berries
016	Western	Forest	65	Diversified vegetables, fruit, quail eggs, and timber
017	Western	Lawrence	50	Seedlings and vegetables
019	Western	Washington	220	Organic grains, grass-fed beef, and eggs
020	Eastern	Lancaster	85	Diverse livestock
021	Eastern	Lancaster	55	Dairy and vegetables

Note. N=16. Other demographic characteristics for semi-structured interview participants were not collected as part of selection and recruitment and because of privacy concerns the interviewees were not linked to their survey responses.

at home. And so we sell this for home use. And so we sell out every year; this will be our 10th year coming up. And every year we sell out, so we sold out last year. And we are at capacity. (Farmer Interview, 008)

A diversified livestock farmer who sells directly in urban markets with a small team of employees had a more positive experience than others and explained the status of their business:

Actually, it's been a silver lining. I do a market at farmer's markets, I sell meat and eggs. And when the grocery stores were empty last spring, they all came to the farmers markets, and since we're totally outside, it's been a blessing for us. (Farmer Interview, 020)

While dairy, egg, and livestock producers in the survey fared slightly worse than fruit and vegetable growers, this farmer, who was marketing directly, was able to find a "silver lining" during the 2020 growing season. Overall, the interviewed farmers conveyed a wide range of experiences and reflected

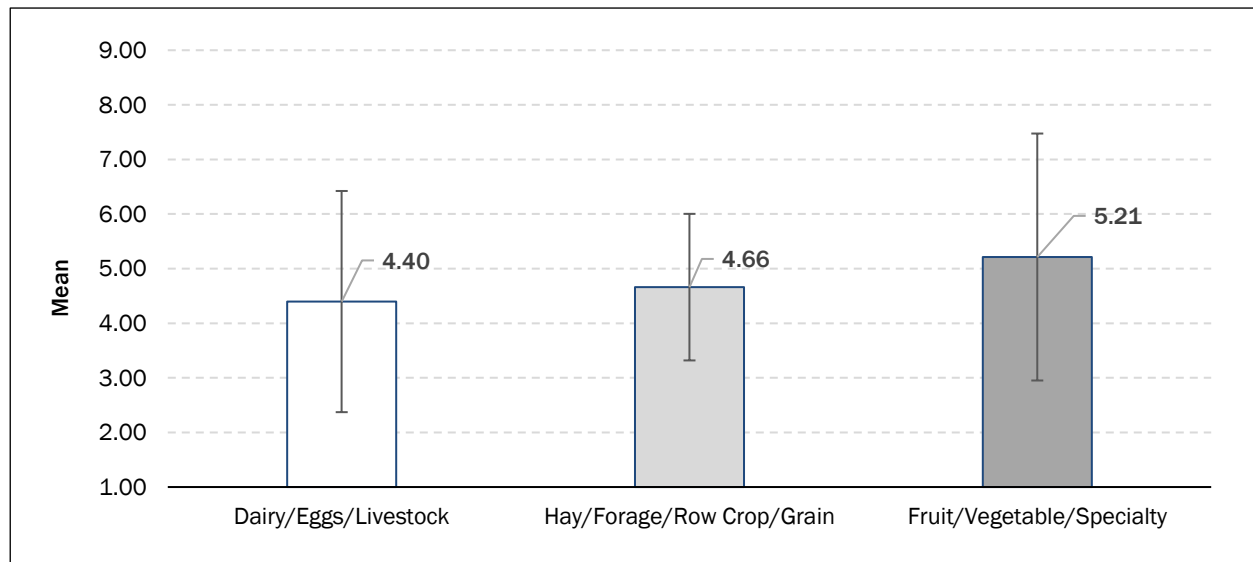
Table 5. Farmer-Estimated Change of Revenue in 2020 Due to COVID-19 Pandemic

	Frequency ^a	Valid Percent
>50% loss	27	9.1%
26–50% loss	18	6.0%
11–25% loss	51	17.1%
1–10% loss	29	9.7%
No change	63	21.1%
1–10% increase	54	18.1%
11–25% increase	34	11.4%
26–50% increase	17	5.7%
>50% increase	5	1.7%
Total	298	100.0%

^a Of the total 318 survey participants, 298 farmers responded to this question.

a time of substantial shifts and uncertainties that were understandably linked to pre-existing practices and marketing challenges. The quotations above are not meant to be representative of these mixed experiences but instead add depth to some of the specific farmer experiences regarding the impact of the pandemic on their businesses.

Figure 2. Change in Revenue Due to the COVID-19 Pandemic



Note. 289 farmers responded to this question. The farmers were asked to rate their change in revenue on a 9-point scale (1 = > 50% loss, 2 = 26-50% loss, 3 = 11-25% loss, 4 = 1-10% loss, 5 = no change, 6 = 1-10% increase, 7 = 11-25% increase, 8 = 26-50% increase, 9 = >5% increase). The error bar indicates the standard deviation.

Relief Program Participation

In our sample, 291 farmers responded to the questions about relief program participation. The results showed that 143 respondents (49%) participated in at least one pandemic-relief program and 148 farmers (51%) participated in no relief programs.

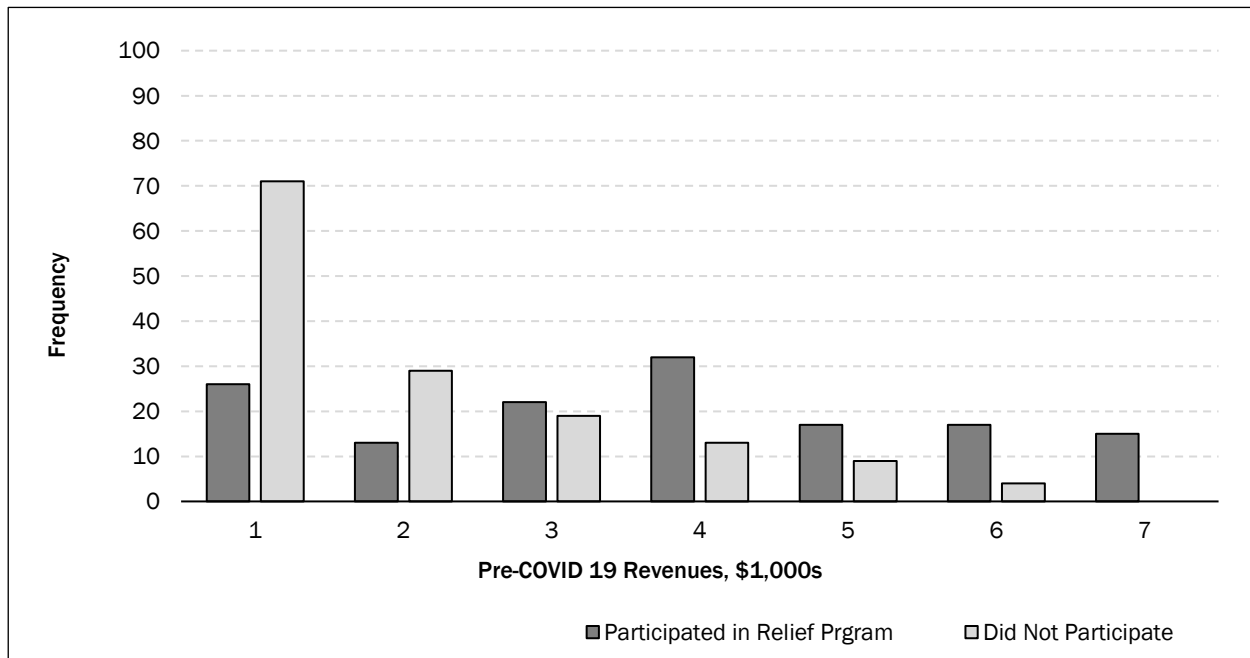
We further explored the farm characteristics to examine potential differences in the relief program participation. A point-biserial correlation was computed between pre-COVID revenue and relief program participation. The correlation was significant, $r(287) = -.44, p < .001$. A moderate, negative association was observed between pre-COVID revenue and relief program participation. The results suggested that farmers who reported lower pre-COVID revenue were less likely to participate in the relief programs (Figure 3).

Of those who participated in at least one pandemic-related relief program, 88 (62%) of our respondents named CFAP1/CFAP2, while another ten farmers indicated CARES, FSA, or USDA, which may have been their name for CFAP. Seventy-four (52%) of our farmers indicated participation in an SBA program, with more of them identifying the PPP ($n=66$) than EIDL

($n=8$). More than a quarter (27%) of our sample reported participating in more than one program. Some farmers also participated in other localized programs. On the other hand, 42 (28%) selected the survey option that indicated an inability to determine eligibility or how to apply. One of these farmers commented on the survey, “I was confused about filling out the form and they gave me the incorrect information (referred me to the wrong program) and then the application expired.” Similarly, another farmer wished for a “better explanation [of] grants that we are eligible to apply for.” Of these 42 farmers, almost 60% ($n=25$) reported at least some revenue loss due to COVID, 14% reported no change, and 26% showed some increase in revenue.

Finally, we explored whether farmers’ participation in the relief program would vary across different types of predominant output using a Chi-square test. There was not a significant association between farmers’ participation in the relief program and their predominant output (i.e., dairy/eggs/livestock, hay/forage/row crop/grain, and fruit/vegetable/specialty farms; see Figure 4).

Our semi-structured interviews featured a number of perspectives from farmers regarding the

Figure 3. Histograms of Typical Pre-COVID-19 Annual Revenues for Farms That Participated in Federal Relief Funds and Farms That Did Not

Note. 291 farmers responded to this question. The farmers were asked to rate their typical (pre-2020) yearly farm revenues on the following options (1 = US\$1,000–24,999, 2 = US\$25,000–49,999, 3 = US\$50,000–99,999, 4 = US\$100,000–249,999, 5 = US\$250,000–499,999, 6 = US\$500,000–999,999, 7 = Greater than US\$1,000,000).

process of participating in federal relief programs such as CFAP. One specialty mushroom grower explained that applying for and receiving these funds was straightforward and supported by National Research Conservation Service (NRCS) agents and accounting software that they use to monitor farm finances:

So what I did, I compared the 2019 mushroom sales, to our 2020 mushroom sales. I had those numbers right there, we use QuickBooks, so it was just right there like night-and-day numbers. Through our local NRCS agency, you know, they're under USDA. But [CFAP] was a real simple application. And I think there were maybe \$5,000 lost in sales. We just submitted that, and then we received a check. (Farmer Interview, 014)

In another interview, one of the farmers indicated that a key challenge was figuring out the appropriate pathways for applying for funds: "It wasn't difficult. The only difficult thing was, I

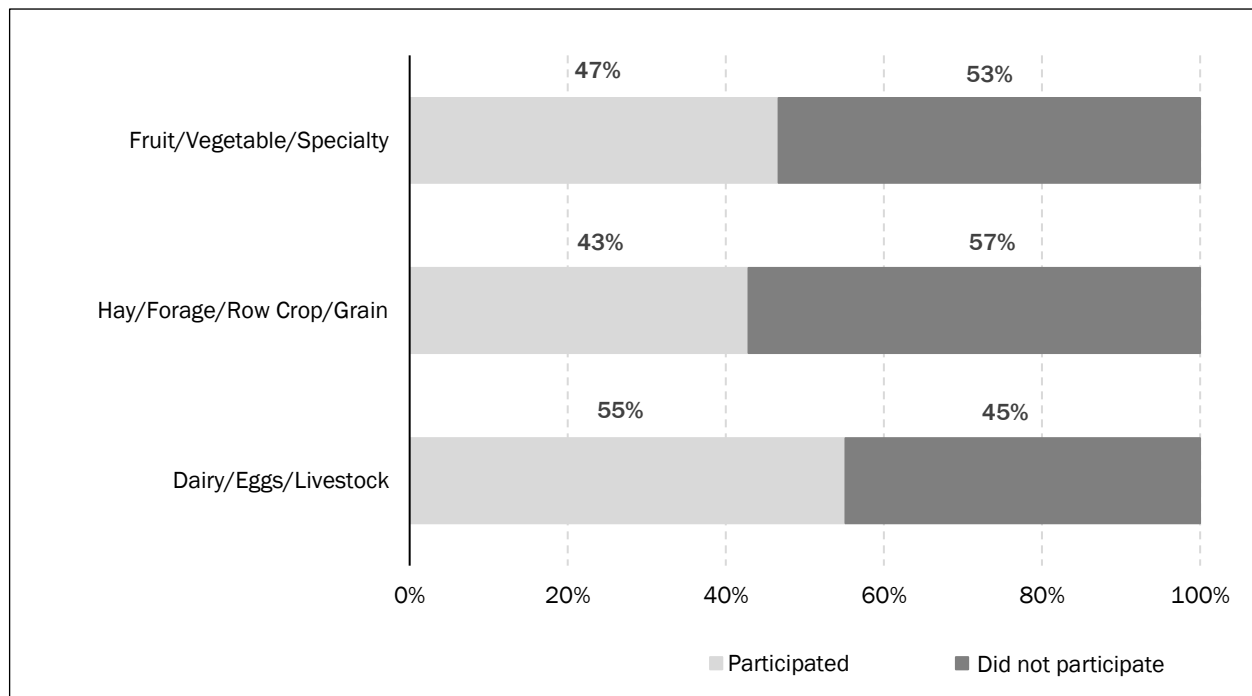
guess, like deciding, you know, who to apply through, we just went with a local bank, Fulton bank. They helped us with the application" (Farmer Interview, 009).

Qualitative data from the survey and semi-structured interviews suggests that knowing how to navigate and engage with infrastructure to support farm businesses, such as the NRCS and regional banks who were positioned to support farm businesses, was key for some of the interviewed farmers.

Adaptation Strategies

Participants in this study were also asked about their business adaptation strategies after the COVID-19 pandemic began. Particularly, we were interested in exploring whether DTC sales, such as CSAs, farmers' market participation, and/or on-farm sales, positively supported revenue during the pandemic. In our sample, about half of the research participants reported maintaining or increasing their DTC sales ($n = 150$, 51.4%), and the rest reported a decrease or no DTC.

Figure 4. Farmer's Relief Program Participation and Farm Type



Note. 291 farmers responded to this question. No statistical significance, X^2 ($df=2$)=3.00, $p=.223$.

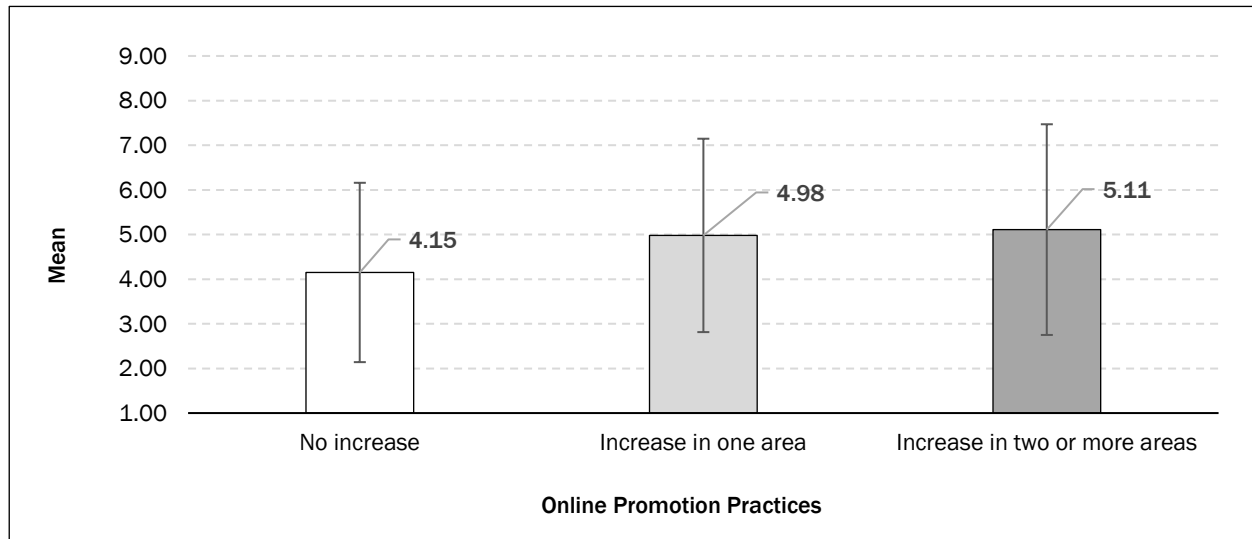
We conducted an independent samples t-test to compare farmers' ratings of revenue change between farmers who maintained or increased DTC sales and farmers who decreased or made no DTC sales. Levene's test of homogeneity suggested that the variances of farmers' ratings were not homogeneous. Therefore, we used Welch's t-test analysis and the adjusted degree of freedom. The analysis was significant, t (288)=9.08, $p<.001$. Our results suggested that farmers who decreased or made no DTC sales reported significantly greater financial losses than those who maintained or increased their DTC sales.

When asked about their online promotion practices, 94 (45.9%) respondents reported that they enhanced or added two or more online promotion practices, such as a business website, marketing emails, Facebook page, or Twitter. We conducted a one-way ANOVA to compare farmers' ratings of revenue change by enhancing or adding an online promotion approach. The analysis was significant, F (2, 200)=3.98, $p=.020$. Specifically, farmers who made enhancements in two or more online promotion approaches ($M=5.11$,

$SD=2.36$) reported a significantly higher gain than those who did not make any enhancement ($M=4.15$, $SD=2.01$; Figure 5). Overall, our results supported that farmers' DTC sales and online promotion practices were associated with less loss in farm revenue.

Exploring additional community-based relationships to provide direct service opened up new opportunities for some farmers to understand the resiliency benefits of more regionally based food systems. For example, an interviewee described not only how more DTC arrangements facilitated sales during the pandemic but also how further coordination with neighboring farms and food producers supported that revenue growth:

Well, during the pandemic, it really came to be a lot of local markets, farmers markets, were taking extra products from other people, other farmers to sell so that they had more product to give to the public, ... and that really boosted productivity, and our income for the farm went way up. (Farmer Interview, 002)

Figure 5. Revenue Change and Online Promotion Practices

Note. 203 farmers responded to this question. The farmers were asked to rate their change in revenue on a 9-point scale (1 = >50% loss, 2 = 26–50% loss, 3 = 11–25% loss, 4 = 1–10% loss, 5 = no change, 6 = 1–10% increase, 7 = 11–25% increase, 8 = 26–50% increase, 9 = >50% increase). The error bar indicates the standard deviation.

While recognizing the importance of DTC sales and online ordering systems, one farmer admitted the need for professional help:

We're attempting to improve our direct-to-farm marketing, but the expenses of hiring a qualified professional to develop a website, online store, social media marketing, professional logo and design work is prohibitive when you can't predict sales. (Open-Ended Survey Response)

In some cases, farmers may need specific training and enhanced capacity to manage inventory, packing and ordering. However, one farmer possessed those skills and described how they adjusted business operations during the pandemic to offer farm-produce delivery services: "When the pandemic started, we started to look at offering pretty much pre-ordering services, by the way of home delivery, but also offering market pickup. So folks could place an order online, I use a software called Acropolis" (Farmer Interview, 009)

Both PA farmers and food systems experts appreciate the potential for DTC and robust regional distribution networks to meet current and anticipated food supply chain challenges. The

open-ended survey question asking farmers about their future plans elicited many mentions of DTC, including "hoping to sell more freezer beef direct to the consumer" and "working to increase yield for pick-your-own in anticipation of another year of strong demand." One farmer's comment summed up many farmers' views about their future plans: "more direct-to-consumer sales and marketing."

Discussion

Our study examined the financial impacts of the pandemic on PA farmers, their participation in federal relief programs, and adaptive strategies to minimize disruptions to their businesses. In this section, these findings are situated with other research on the impact of COVID-19 on farmers in the U.S., and we include some noteworthy perspectives from semi-structured interviews and qualitative survey data. While snapshot assessments of farm revenue early in the pandemic indicated significant financial losses, our findings, like those of McElrone et al. (2022), who performed a full-year (2020) review of farmers in Tennessee, showed mixed results that appeared to be mediated by the farmers' adaptability to meet the challenges and opportunities presented by COVID-19. Less

than half of our surveyed farmers (42%, n=125) reported a negative revenue change, while more than half (58%, n=173) reported no change or a positive change in revenue due to the pandemic compared to previous years. A closer look at our farmers' experiences with and participation in federal relief programs as well as their use of DTC and online marketing channels can help inform policies and priorities that support the viability of smaller, regional farmers in the future.

Participation in Federal Relief Programs

As noted earlier, the CARES Act provided the agricultural sector an opportunity to access US\$35 billion dollars in federal relief funds in 2020, with almost US\$30 billion of that amount going to farm operations, an amount significantly higher than any federal agriculture funding in recent history (Giri et al., 2021). Consistent with the national data, federal relief payments to farmers in PA rose in 2020, with CFAP 1 and 2 providing the major source of agricultural relief to PA farmers and ranchers. Applying for CFAP was a relatively simple online process, and local FSA staff were available to assist as needed. Approximately 38% of PA farmers and ranchers received a total of \$411 million (USDA Farmers.gov, n.d.-a; USDA Farmers.gov, n.d.-b) compared to 20.5% of PA farmers receiving a total of \$74.1 million in 2017 (USDA NASS, n.d.-b). In our sample, a greater percentage (49%) of farmers than the PA average received federal support. This greater number may reflect that the average farm size of the surveyed farmers was larger than that of the average PA farm (261 compared to 137 acres) and that farmers with higher revenues were over-represented in the survey sample. As noted by Belasco and Smith (2022), these attributes increased the likelihood of receiving federal aid. The USDA-published qualification criteria for CFAP grants was production-specific based on the farmer reporting usual production and anticipated lost revenue due to the pandemic (USDA FSA, 2020; USDA Farmers.gov, n.d.-a; n.d.-b). One farmer interviewed supported this view by describing the ease with which he applied for and received US\$5,000 due to a drop in mushroom sales (Farmer Interview, 014). Like farmers nationwide, the surveyed farmers also accessed SBA programs

with PPP, a forgivable loan, predominating over EIDL, a traditional loan. More than one quarter of the respondents participated in more than one aid program, although some farmers communicated in the survey that they usually can manage on their own. One farmer shared: “[Relief programs] definitely helped us to cash flow, [but] we try to manage our business that we don’t need that extra money thrown at us” (Farmer Interview, 004).

Although none of the farmers interviewed complained about the amount of their CFAP grant, nationwide, small and mid-sized farms (per farm revenue) receiving CFAP funds received a proportionately lesser amount of total funds than the larger farms (Belasco & Smith, 2022). Relatedly, we found that farmers who reported lower pre-COVID revenue compared to higher-revenue farms were less likely to participate in relief programs (Figure 3). Bekkerman et al. (2018) noted that any COVID-related federal relief was in addition to the direct payment support some farmers traditionally receive from the USDA, such as Federal Crop Insurance, Agriculture Risk Coverage, and/or Price Loss Coverage. Bekkerman et al. argue that, moving forward, given the high price of these programs, caps should be set on relief payments and some farmers already receiving federal support should be ineligible for disaster funding. One of the farmers interviewed expressed similar concerns:

I don’t know, you know, at what point in time, there really should have just been a cap [on relief funding. ... I think it should have just been one general cap, I don’t think you need to throw a lot of money out there. That money has to come from somewhere. (Farmer Interview, 004)

Although SBA funding targeted small farmers, applications for PPP and EIDL required a visit to an SBA-affiliated lender, usually a bank with that designation (Ludwig, 2021; SBA, 2021). If a farmer was connected to a lender, the PPP application process was relatively easy.

However, several farmers felt the funds available through the SBA, once received, were insufficient. One farmer highlighted the difference be-

tween their needs and what was available, as well as the difference between a PPP and SBA loan (EIDL):

Well, see the trick was, PPP, they give you two times your payroll, and they stop. So, what do you get? If your payroll is \$4,000 a month, you get \$1,000. What's that's going to do? Nothing. So, okay, we're going to waive it. But I look at it as it's not even worth the aggravation. [...] SBA loan [EIDL], just payable back on a 10-year note, but when you need a million dollars, and they give you \$80,000, you got \$920,000 in difference, and then they limit you to like \$150,000 or \$200,000. (Farmer Interview, 016)

It is possible that those criticizing the inadequacy of the SBA loan did not get all the money to which they were entitled. Farmers were permitted to include rent and utility costs in their SBA application, but according to Demko et al. (2021), this was not clearly communicated. Considering the structure of disaster relief programs that entail loans instead of grants is critical. While PPP was a forgivable “loan,” EIDL is a traditional loan that requires repayment and adherence to terms that can be counterproductive to farm businesses. The blanket security agreement found in EIDL loans more than \$25,000 requires the farmer to involve the SBA in any future transaction of assets used as collateral. This can constrain how farms and farmers buy and sell equipment and land that they used as loan collateral, creating far-reaching implications for farm businesses that may warrant policy changes (McEowen, 2021).

Nonparticipation in Federal Relief Programs

Just over one-half (51%) of the farmers surveyed did not participate in a federal relief program, a finding similar to that of McElrone et al. (2022). With an eye to future policies that promote small and mid-size farm resilience, we were interested in examining this issue. In general, the farmers who did not participate in federal relief programs had a lower pre-COVID revenue than relief program participants. Nonetheless, 44% of these farmers indicated a lack of interest in participating, and 20% reported not being eligible. They indicated

that sales were good and they did not need financial aid. For example, one farmer shared: “We knew they [relief programs] were there. And they were available, but we just didn’t find the necessity for it. We were fine without” (Farmer Interview 02).

However, 42 of the farmers who received no federal support indicated that they were unable to determine their eligibility for relief or how to apply for aid. This is consistent with recent findings showing that the smallest business are often unaware of available government assistance (Demko et al., 2021; Humphries et al., 2020) and that smaller PA farmers often lacked a connection to loan and grant providers (Econsult Solutions Inc.; 2021). These 42 farmers had remarkably low pre-COVID revenues. While 76% of them had an annual revenue less than US\$50,000, half of them had pre-COVID revenues of US\$1,000–24,999. In that subset, almost 60% of farmers reported a COVID-related revenue loss, compared to 42% of the full sample reporting a loss. It is unknown whether this group would have been eligible for a CFAP grant or PPP forgivable loan, or whether those funds may have mitigated their losses. We also do not know whether these farmers had off-farm income and, if so, how much a loss in farm income affected them. Yet, these farmers with likely the greatest need for assistance were unable to pursue federal aid due to lack of information. Possibly, these farmers live in a community without an SBA-affiliated bank or lender or, in the case of CFAP, are unfamiliar with the local FSA staff who could share grant availability, answer questions, or assist those without internet access. For smaller regional farmers, extension agents, Farm Bureau staff, and other farm-facing organizations may be best positioned to reach farmers with needed information, and this outreach should be supported in future policy interventions and emergency aid programs.

Direct-to-Consumer Trends and Resiliency

One way that farmers and food businesses may have maintained or enhanced resiliency was by leveraging DTC relationships and shorter supply chains during the pandemic (Perrin & Martin, 2021; Thilmany et al., 2021). We found that about

one-half of the farmers surveyed maintained or increased their DTC sales. Those farmers who did not participate in DTC sales or who decreased DTC sales were more likely to report significantly greater losses than those who maintained or increased their DTC sales. Food systems with short supply chains facilitate a connectedness between the stakeholders that better position the systems to adjust to market disturbances. In our study, gathering data from a wide range of farmers in PA offered a natural way to explore the potential of regional food systems to offer competitive advantages over transnational, globalized food systems through regional relationships. We found that while some of the regional farmers may be locked into production and marketing channels and thus unable to pivot and redirect product, the farmers who were able to adopt more DTC marketing channels experienced less revenue loss during the first year of the COVID-19 pandemic. Both PA farmers and food systems experts appreciate the potential for DTC and robust regional distribution networks to meet current and anticipated food supply chain challenges.

Thilmany et al. (2021) argued that the supply chain relationships between laborers, producers, and consumers in local and regional food systems enabled an increased focus on DTC sales with the ability to bypass the intermediaries (institutions, restaurants) that were most affected by COVID-19. However, they argued, broadband access, e-commerce education, and technical support for these platforms are key to success for DTC sales. Likewise, in a recent ethnographic study of farmers and food system actors in North Carolina, O'Connell et al. (2021) described the ways in which regional farmers were able to adapt quickly while other regional actors were able to leverage relationships and networks to help alleviate supply chain challenges. Assuring these regional systems are viable during times of shock requires more than support for farmers on the national and multi-national distribution level. It requires ongoing investments in maintaining regional marketplaces, regional aggregation, and meat-processing facilities, and providing adequate training and infrastructure centered on more DTC relationships. Borges-Méndez and Caron (2019) encouraged a view of

resiliency that looks toward regional actors and growers to maintain and envision food system arrangements following major disruptions after Hurricane Irma and Maria in Puerto Rico. Our work, along with Perrin and Martin (2021), Whitehouse et al. (2023), and Thilmany et al. (2021), suggests that these shorter supply chains may contribute to financial resiliency for farmers. While the disruptions due the pandemic were unique in both the duration and scope of their impact, it is likely that ongoing shocks due to climate change will continue to threaten food system function (FAO, 2013). It may be necessary to consider how government can further financially support the coordination of regional food systems while maintaining the agency and adaptive capacity of regional farms utilizing more direct marketing channels.

Limitations and Future Research

There are several important limitations of this study and some important pathways forward for future empirical work. Firstly, because there was not a pre-existing sampling frame or trustworthy database of all farmers in PA, it was not possible to calculate an overall response rate for our survey. Although our respondents aligned with the demographic profile of PA farmers, the survey responses over-represented larger farms with annual revenues greater than US\$250,000 and did not include farmers with revenue less than US\$1,000. This may have contributed bias to our data and analysis. Lower-revenue farms, or farms that grew and distributed food directly to their communities, may warrant future examination especially because of their potential adaptability during times of disruption. Additionally, the surveys and interviews relied upon retrospective, self-reported data. We considered these limitations as necessary in order to minimize privacy concerns and any potential risks for participants. Our analysis of semi-structure interviews was primarily deductive and aimed to enhance understanding of our quantitative findings. This qualitative data, and studies of other farmer experiences during the pandemic, could be the subject of more emergent analyses. Additionally, our interview respondents were 50% female, while our survey respondents and the PA census show 35% female farmers. The demographic character-

istics of our respondents closely matched the race/ethnicity characteristics of farmers in PA; however, this meant that there were a small number of respondents of farmers holding non-white identities. This limited further statistical analysis of survey results, and the lived experiences of racially and ethnically diverse farmers in PA should be the subject of ongoing research. This survey focused on farmer owner/operators rather than farmworkers. Though it was outside the scope of this study, future work should examine how the pandemic impacted the lived experience of these important workers.

Conclusion

Our study was uniquely positioned to explore adaptive strategies farmers enacted to weather the pandemic and to explore policy initiatives and aid programs designed to lessen the financial hardships of farmers and preserve the function of the food system during a time of great disruption. We hope that these findings will be useful in informing policies, programs, and initiatives to support farmers during major market disruptions.

Looking Back at 2020

After this period of substantial upheaval in nearly every sector of the food system and unprecedented investments by the federal government to support farmers, it is important to report and reflect on the empirical impacts on farmers, their strategies for maintaining viable operations, and the reach of federal funding programs. With a full year (2020) look-back at PA farmers, we found that the early predictions of severe financial losses for regional farmers did not hold true. In our sample, less than half of farmers (42%) reported a negative revenue change, 21% no change, and 37% a positive change in revenue due to the pandemic compared to previous years. Additionally, almost one half of our farmers took advantage of federal farm relief offered nationwide, with those farmers with higher pre-COVID revenues more likely to participate. Conversely, a subset of lower-revenue farmers, who also experienced a drop in revenue due to the pandemic, was unsure of how to apply for aid. A better understanding of the nature of participation and the protective effects of these farm relief pro-

grams could help further describe which types of food systems are able to persist in the future. The pandemic and other ecological disturbances highlight pain points in the food system and offer an opportunity to leverage the voices and experiences of farmers to describe the nature of support needed to continually respond to current and future disruptions.

DTC marketing channels, a hallmark of regional food systems, may have served a protective role for the smaller farmers, who were able to better leverage these markets or were agile in their marketing and distribution to redirect foods and close important gaps in the food system during the early phases of the pandemic. These channels may mitigate future disruption, regardless of source. In our sample, slightly over half of the farmers reported their DTC sales as remaining the same or increased during 2020, and we found that participating in DTC sales, as well as having an online presence, was revenue-protective.

Policy Implications

To assure the stability of these protective DTC relationships, federal assistance and future investment should focus on enhancing infrastructure and the capacity of regional food systems, which have been shown to be more resilient to disruption than the current food system. This support should range from training farmers in needed computer and marketing skills to supporting the regional food-processing infrastructure to enabling broadband access in all rural communities. It is also likely that direct monetary support to farmers—not a new concept—will continue to be necessary in times of severe disruption from climate change, future pandemics, and more. On the federal level, the type of, scope of, and eligibility for farm aid needs to be re-evaluated to prioritize small and mid-sized farmers (based on revenue), to target those farmers not benefitting from other federal agricultural support, and to base eligibility and funding amounts on metrics meaningful to these non-commodity farm operations. Federal policy should recognize the unique needs of smaller farmers seeking to build a viable farm business and, when necessary, adapt their practices during times of disruption. Targeted outreach to these farmers to both inform them of

available federal aid and to provide application assistance is needed. With the right policies and structures in place, regional food systems can not only be a viable market option during normal times but also may be best positioned to support farmers and consumers during times of disruption and unforeseen challenges.



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References

- Bekkerman, A., Belasco, E. J., & Smith, V. H. (2019). Does farm size matter? Distribution of crop insurance subsidies and government program payments across U.S. farms. *Applied Economic Perspectives and Policy*, 41(3), 498–518. <https://doi.org/10.1093/aep/ppy024>
- Belasco, E. J., & Smith, V. (2022). The impact of policy design on payment concentration in ad-hoc disaster relief: Lessons from the market facilitation and Coronavirus Food Assistance Programs. *Food Policy*, 106, Article 102189. <https://doi.org/10.1016/j.foodpol.2021.102189>.
- Bell, S., Clarke, R., Mounier-Jack, S., Walker, J. L., & Paterson, P. (2020). Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England. *Vaccine*, 38(49), 7789–7798. <https://doi.org/10.1016/j.vaccine.2020.10.027>
- Borges-Méndez, R., & Caron, C. (2019). Decolonizing resilience: The case of reconstructing the coffee region of Puerto Rico after Hurricanes Irma and Maria. *Journal of Extreme Events*, 6(1), Article 1940001. <https://doi.org/10.1142/S2345737619400013>
- Center for Dairy Excellence. (n.d.). *PA dairy overview*. Retrieved February 20, 2023, from <https://www.centerfordairyexcellence.org/pa-dairy-goodness-that-matters/pa-dairy-overview/>
- Demko, I., Sant'Anna, A. C., & Liang, K. (C. L.) (2021). An overview of the Paycheck Protection Program (PPP) loans and implications for agricultural enterprise recovery from COVID. *Journal of Agriculture, Food Systems, and Community Development*, 11(1), 201–208. <https://doi.org/10.5304/jafscd.2021.111.003>
- Econsult Solutions, Inc. (2021, May 10). *The economic impact of agriculture in Pennsylvania: 2021 update*. <https://econsultsolutions.com/the-economic-impact-of-agriculture-in-pennsylvania-2021-update/>
- Egan, F., & Bay Nawa, S. (2021). *Financial benchmarks for direct-market vegetable farms: 2021 report*. Pasa Sustainable Agriculture. <https://pasafarming.org/resources/financial-benchmarks-for-direct-market-vegetable-farms/>
- Food and Agriculture Organization of the United Nations [FAO]. (2013). *Resilient livelihoods: Disaster risk reduction for food and nutrition security*. <https://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/423839/>
- Giri, A. K., McDonald, T., Subedi, D., & Witt, C. (2021, September 7). U.S. agriculture sector received an estimated \$35 billion in COVID-19-related assistance in 2020. USDA ERS. <https://www.ers.usda.gov/amber-waves/2021/september/u-s-agriculture-sector-received-an-estimated-35-billion-in-covid-19-related-assistance-in-2020/>
- Han, Y., & Goetz, S. J. (2015). The economic resilience of U.S. counties during the Great Recession. *Review of Regional Studies*, 45(2), 131–149. <https://doi.org/10.52324/001c.8059>.
- Hendrickson, M. K. (2015). Resilience in a concentrated and consolidated food system. *Journal of Environmental Studies and Sciences*, 5, 418–431. <https://doi.org/10.1007/s13412-015-0292-2>
- Humphries, J. E., Neilson, C., & Ulyssea, G. (2020). The evolving impacts of COVID-19 on small businesses since the CARES Act (Cowles Foundation Discussion Paper No. 2230). New York University Stern School of Business. <https://doi.org/10.2139/ssrn.3584745>

- Hungerford, A., Effland, A., & Johansson, R. (2021). Agricultural and food policy response to COVID-19. *Choices*, 36(3), 1–7. <https://www.jstor.org/stable/27098610>
- Jackson-Smith, D., & Veisi, H. (2021). Media coverage of a pandemic's impacts on farmers and implications for agricultural resilience and adaptation. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 157–179. <https://doi.org/10.5304/jafscd.2021.102.039>
- Johansson, R. (2020, September 24). America's farmers: Resilient throughout the COVID pandemic. *U.S. Department of Agriculture Blog*. <https://www.usda.gov/media/blog/2020/09/24/americas-farmers-resilient-throughout-covid-pandemic>
- Kelsey, T. W., Ciganik, E., Shi, J., & Gurklis, A. (2021). *Understanding the quiet majority: Small farms in Pennsylvania, 2017*. Penn State Center for Economic and Community Development. https://aese.psu.edu/research/centers/cecd/publications/pa-agriculture-analysis/impact-of-small-farms-in-pa-2017_psu-cecd_may2021.pdf
- Ludwig, S. (2021, June 1). *23 frequently asked PPP loan questions, answered*. U.S. Chamber of Commerce. <https://www.uschamber.com/co/run/business-financing/commonly-asked-questions-coronavirus-small-business-loans>
- Mastronardi, L., Cavallo, A., & Romagnoli, L. (2022). How did Italian diversified farms tackle Covid-19 pandemic first wave challenges? *Socio-Economic Planning Sciences*, 82(Part A), Article 101096. <https://doi.org/10.1016/j.seps.2021.101096>
- McElrone, M., Russomanno, J., & Wroth, K. (2022). A pilot study assessing the impacts COVID-19 on Tennessee farmer social needs and pandemic-related anxiety. *Journal of Agriculture, Food Systems, and Community Development*, 11(3), 75–85. <https://doi.org/10.5304/jafscd.2022.113.009>
- McEwen, R. A. (2021, July 7). *The "EIDL Trap" for farm borrowers*. Agricultural Law and Taxation Blog. <https://lawprofessors.typepad.com/agriculturalaw/2021/07/the-eidl-trap-for-farm-borrowers.html>
- McReynolds, R. (2020). *Sales fell for 76% of local farms due to COVID-19*. Carolina Farm Stewardship Association. <https://www.carolinafarmstewards.org/sales-fell-for-76-of-local-farms-due-to-covid-19>
- O'Connell, C., Gay, R., McDonald, N., & Tayal, S. (2021). COVID connections: Lessons from adaptations to COVID-19 as strategies for building food system resilience. *Culture, Agriculture, Food and Environment*, 43(2), 123–136. <https://doi.org/10.1111/cuag.12276>
- Orden, D. (2021, June). Agrifood markets and support in the United States after 1 year of COVID-19 pandemic. *Canadian Journal of Agricultural Economics/Revue Canadienne D'Agroéconomie*, 69(2), 243–249. <https://doi.org/10.1111/cjag.12278>
- Perrin, A., & Martin, G. (2021). Resilience of French organic dairy cattle farms and supply chains to the Covid-19 pandemic. *Agricultural Systems*, 190, Article 103082. <https://doi.org/10.1016/j.agsy.2021.103082>
- Richards, S., & Vassalos, M. (2021). COVID-19 and consumer demand for local meat products in South Carolina. *Journal of Agriculture, Food Systems, and Community Development*, 10(3), 31–36. <https://doi.org/10.5304/jafscd.2021.103.004>
- Ricker, H., & Kardas-Nelson, M. (2020, April 9). *Community supported agriculture is surging amid the pandemic*. Civil Eats. <https://civileats.com/2020/04/09/community-supported-agriculture-is-surging-amid-the-pandemic/>
- Shilton, A. C. (2020, April 28). Here's why CSAs are thriving during the pandemic. *The Counter*. <https://thecounter.org/csa-sales-struggling-before-coronavirus-covid-19/>
- Small Business Association [SBA]. (2021). *COVID EIDL loans information as of September 8, 2021*. <https://www.sba.gov/sites/default/files/2021-09/COVID-EIDL-FAQs-090821-508.pdf>
- Thilmany, D., Canales, E., Low, S. A., & Boys, K. (2021). Local food supply chain dynamics and resilience during COVID-19. *Applied Economic Perspectives and Policy*, 43(1), 86–104. <https://doi.org/10.1002/aep.13121>
- U.S. Department of Agriculture [USDA] Economic Research Service [ERS]. (2021, January 6). *Farm structure and contracting*. Retrieved March 8, 2022, from <https://www.ers.usda.gov/topics/farm-economy/farm-structure-and-organization/farm-structure-and-contracting/>
- USDA ERS. (2023). *Government payments by program*. <https://data.ers.usda.gov/reports.aspx?ID=17833>

- USDA Farmer.gov. (n.d.-a). *Coronavirus Food Assistance Program 1*. Retrieved June 5, 2023, from <https://www.farmers.gov/coronavirus/pandemic-assistance/cfap1/data>
- USDA Farmer.gov (n.d.-b). *Coronavirus Food Assistance Program 2 data*. Retrieved June 5, 2023, from <https://www.farmers.gov/coronavirus/pandemic-assistance/cfap2/data>
- USDA Farm Service Agency [FSA]. (n.d.). *History of USDA's Farm Service Agency*. Retrieved June 5, 2023, from <https://www.fsa.usda.gov/about-fsa/history-and-mission/agency-history/index>
- USDA FSA. (2020). *Coronavirus Food Assistance Program fact sheet*. <https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/cfap-general-factsheet.pdf>
- USDA National Agricultural Statistics Service [NASS]. (n.d.-a). *2017 Census of Agriculture State Profile: Pennsylvania*. Retrieved December 20, 2022, from https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Pennsylvania/cp99042.pdf
- USDA NASS. (n.d.-a). *2017 Census of Agriculture – Pennsylvania: Table 2*. Retrieved December 20, 2022, from https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Pennsylvania/
- USDA NASS. (n.d.-b). *2017 Census of Agriculture – Pennsylvania: Table 6*. Retrieved December 20, 2022, from https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Pennsylvania/
- USDA NASS. (n.d.-c). *2017 Census of Agriculture State Profile: Pennsylvania*. Retrieved December 20, 2022, from https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Pennsylvania/cp99042.pdf
- USDA National Institute of Food and Agriculture [NIFA]. (n.d.). *Small and family farms*. Retrieved December 20, 2022, from <https://www.nifa.usda.gov/topics/small-family-farms>
- Westervelt, E. (2020, May 14). During pandemic, community supported agriculture sees membership spike. *National Public Radio*. <https://www.npr.org/2020/05/14/855855756/as-pandemic-devastates-economy-community-supported-agriculture-sees-membership-s>
- Whitehouse, C., Conner, D., Chase, L., & Reynolds, T. W. (2023). The experience of Vermont local food businesses during the first year of the COVID-19 pandemic. *Journal of Agriculture, Food Systems, and Community Development*, 12(2), 1–14. <https://doi.org/10.5304/jafscd.2023.122.003>
- Zeballos, E., & Sinclair, W. (2021, October 4). *Food spending by U.S. consumers fell almost 8 percent in 2020*. USDA ERS. <https://www.ers.usda.gov/amber-waves/2021/october/food-spending-by-u-s-consumers-fell-almost-8-percent-in-2020/>

APPENDIX A. SURVEY QUESTIONS

ABOUT YOUR FARM

1. This Farm is (select one): ☐ Non-profit ☐ For profit
2. Farm's zip code: _____
3. This farm's location is (select one): ☐ Rural ☐ Suburban ☐ Urban
4. How many total acres does the farm own and/or lease? Please restrict to one decimal point.

5. How many acres are under agricultural production (owned and/or leased)? _____
6. How many years has the farm been in business? _____
7. Which of these certifications are on the farm? **Check all that apply.**

☐ No Certifications	☐ Animal Welfare Approved	☐ Certified Biodynamic
☐ Certified Forest Grown	☐ Certified Halal	☐ Certified Humane
☐ Certified Kosher	☐ Certified Naturally Grown	☐ Certified Sustainable
☐ Fair Trade	☐ Food Alliance	☐ USDA Certified Organic
☐ PA Preferred	☐ Protected Harvest	☐ Non-GMO Project Verified
☐ Other: _____		
8. What is the PREDOMINANT output of your operation? **Select one.**

☐ Dairy	☐ Fruit	☐ Hay and Forage	☐ Livestock
☐ Eggs	☐ Row Crop and Grain	☐ Vegetables	
☐ Other (please specify): _____			

OPERATIONAL CHANGES DUE TO COVID-19

9. For items your farm produces commercially, select whether your production decreased, stayed the same or increased DUE TO the COVID-19 Pandemic.

	Not applicable	Decreased production	Stayed the same	Increased production
Alternative energy	☐	☐	☐	☐
Animals (fiber)	☐	☐	☐	☐
Bees	☐	☐	☐	☐
Compost	☐	☐	☐	☐
Cut flowers	☐	☐	☐	☐
Dairy (cow)	☐	☐	☐	☐
Dairy (goat/sheep)	☐	☐	☐	☐
Eggs	☐	☐	☐	☐
Grains	☐	☐	☐	☐
Hay/forage	☐	☐	☐	☐
Herbs (culinary)	☐	☐	☐	☐
Herbs (medicinal)	☐	☐	☐	☐
Hops	☐	☐	☐	☐
Meat—poultry	☐	☐	☐	☐
Meat—beef	☐	☐	☐	☐
Meat—goat/sheep	☐	☐	☐	☐
Meat—pork	☐	☐	☐	☐
Meat—other	☐	☐	☐	☐
Mushrooms	☐	☐	☐	☐
Non-tree fruits & berries	☐	☐	☐	☐

Nursery plants/ ornamentals	☐	☐	☐	☐
Nuts	☐	☐	☐	☐
Timber	☐	☐	☐	☐
Tree fruit	☐	☐	☐	☐
Vegetables	☐	☐	☐	☐
Value-added products	☐	☐	☐	☐
Other:	☐	☐	☐	☐

10. Indicate whether each item on the list below decreased, stayed the same, or increased DUE TO the COVID-19 Pandemic.

Activity	Not applicable	Decreased	Stayed the same	Increased
Events—education	☐	☐	☐	☐
Events—private (wedding, ...)	☐	☐	☐	☐
Events—public (open farm day, festivals, etc.)	☐	☐	☐	☐
Lodging	☐	☐	☐	☐
Restaurant	☐	☐	☐	☐
You-Pick	☐	☐	☐	☐
Other:	☐	☐	☐	☐

FINANCES, SALES, MARKETING

11. In general, how is your farm doing financially DUE TO the COVID-19 Pandemic?

- ☐ Much Worse Off ☐ Slightly Worse Off ☐ No Change
☐ Slightly Better ☐ Much Better

12. Please remember this is an anonymous survey and sales information cannot be linked to your specific farm. What were your typical (pre-2020) yearly farm revenues?

- ☐ Less than \$1,000 ☐ \$1,000- \$24,999 ☐ \$25,000- \$49,999
☐ \$50,000- \$99,999 ☐ \$100,000- \$249,999 ☐ \$250,000- \$499,999
☐ \$500,000- \$999,999 ☐ ≥ \$1,000,000

13. Please estimate your percent change in revenue DUE TO the COVID-19 Pandemic for your farm in 2020.

- ☐ > 50% loss ☐ 26-50% loss ☐ 11-25% loss ☐ 1-10% loss
☐ No Change ☐ 1-10% increase ☐ 11-25% increase ☐ 26-50% increase
☐ > 50% increase

14. After the COVID-19 Pandemic began, what changes in sales did you experience from the following channels?

	Not applicable	Decreased	Stayed the same	Increased
CSA	☐	☐	☐	☐
Direct wholesale to retailers or schools/institutions	☐	☐	☐	☐
Farmers markets	☐	☐	☐	☐
On-farm store or farm stand	☐	☐	☐	☐
Restaurant	☐	☐	☐	☐
Traditional wholesale to auction, distributor, co-op	☐	☐	☐	☐
Donated	☐	☐	☐	☐
Other:	☐	☐	☐	☐

15. How did the way you **promote** your farm business change DUE TO the COVID-19 Pandemic? Please respond to the following.

	Not applicable	Reduced	No change	Enhanced	Added in 2020
Business website	☐	☐	☐	☐	☐
E-Commerce (online sales)	☐	☐	☐	☐	☐
Marketing emails	☐	☐	☐	☐	☐
Facebook page	☐	☐	☐	☐	☐
Other social media (Twitter, Instagram, etc.)	☐	☐	☐	☐	☐

16. Did you have more product waste in 2020 DUE TO the COVID-19 Pandemic?

- ☐ No
☐ Not sure
☐ Yes (if yes, please explain below)

17. What were your total estimated costs to the nearest dollar amount for additional COVID-19 Pandemic-related expenses?

- Safety supplies like masks, gloves, plastic sheeting: _____
- Additional farm or market labor: _____
- Additional marketing expenses: _____
- Additional equipment like refrigerators, hand-washing units, field production, etc.: _____
- Other? Please list and give estimated cost: _____
- No additional costs _____

18. Have you participated in any farm or small business relief programs since the COVID-19 Pandemic began? (e.g., *Payroll, Protection Program, CFAP, private foundation grants, etc.*)

- ☐ No
☐ Yes. Please list programs:

19. In the question above, if you indicated that you have **not** participated in any farm or small business relief programs since the COVID-19 Pandemic began, please indicate why not.

- ☐ I participated in a relief program ☐ Not eligible ☐ Not interested
☐ Unable to determine if I was eligible or how to apply ☐ The funding ran out
☐ Other: _____

LABOR

20. I had difficulty hiring the specialized labor (tractor or machine operators, etc.) I needed during the 2020 season DUE TO the COVID-19 Pandemic.

- ☐ Yes ☐ No ☐ Not Applicable

21. I had difficulty hiring the number of Visa Program workers I needed during the 2020 season DUE TO the COVID-19 Pandemic.

- ☐ Yes ☐ No ☐ Not Applicable

22. I had difficulty hiring the number of **other** non-Visa Program workers (apprentices, hourly workers, etc.) I needed during the 2020 season DUE TO the COVID-19 Pandemic.

- ☐ Yes ☐ No ☐ Not applicable

23. How did your farm work hours, including owner/operator hours, change in 2020 DUE TO the COVID-19 Pandemic?

- ☐ Decreased ☐ No Change ☐ Increased

24. By what percentage, if any, did your labor payroll expenses change DUE TO the COVID-19 Pandemic?

☐ >50% decrease

☐ 26-50% decrease

☐ 11-25% decrease

☐ 1-10% decrease

☐ No Change

☐ 1-10% increase

☐ 11-25% increase

☐ 26-50% increase

☐ >50% increase

25. What changes, if any, might you make to your workforce for the 2021 season?

PERSONAL IMPACT

26. What has been the impact of the COVID-19 Pandemic on your personal/family well-being? ***Check all that apply.***

☐ A family member or friend has passed away

☐ I have been sick, which has impacted my household and/or ability to farm

☐ My care-giving responsibilities (children, loved ones, self, other) have increased

☐ My non-farm household income (mine or family member's) has decreased or been eliminated

☐ My non-farm household income (mine or family member's) has increased

☐ I've enjoyed more time with family

☐ I've changed my farm operations for the better

☐ I've connected more with my community

☐ Other:

27. Looking towards 2021, what steps are you taking to improve your farm business?

INFORMATIONAL/EDUCATIONAL NEEDS

28. How do you prefer to receive farm/business-related information/education? **Check all that apply.**

- ☐ Webinars
- ☐ Tele/video conference meetings (like Zoom)
- ☐ Short Instructional videos
- ☐ Factsheets or printed guides
- ☐ Emails
- ☐ In person event or conference
- ☐ Other: _____
- ☐ No information/education needed

29. What type of marketing assistance do you need? **Check all that apply.**

- ☐ Identifying and setting up an online platform
- ☐ Setting up ordering and distribution systems
- ☐ Marketing, promotion, how to reach new customers
- ☐ Sourcing suppliers (bags, boxes, twist-ties, etc)
- ☐ Identifying and contacting new wholesale markets
- ☐ Other: _____
- ☐ No assistance needed

30. What production and/or labor-related needs or interests do you have? **Check all that apply.**

- ☐ Production planning for farmers market sales
- ☐ Production planning for CSAs
- ☐ Production planning for intermediate and wholesale markets
- ☐ Production planning for online-based sales platform
- ☐ Projecting labor needs
- ☐ Employee physical and emotional well-being
- ☐ Other: _____
- ☐ No production or labor-related needs/interest

31. What type of food safety and/or worker safety information do you need? **Check all that apply.**

- ☐ How to safely clean, sanitize, & disinfect food contact & high contact surfaces on your farm
- ☐ How to assure consumers that their food supply is secure
- ☐ Employee/employer issues, e.g., paid sick leave or monitoring temperatures
- ☐ Social distancing on farm
- ☐ How to quickly transition to GAP for access to new markets
- ☐ Use PPE (personal protective equipment) on your farm
- ☐ Understanding new OSHA or other guidelines related to the COVID-19 Pandemic
- ☐ Other:
- ☐ No assistance needed

32. What aren't we asking you that you would like us to know about your experience during the 2020 season? Please continue your response on page 10 if needed.

DEMOGRAPHICS

33. Are you Hispanic, Latino, or Spanish origin? (optional): ☐ Yes ☐ No
34. Race- please check all that apply (optional): ☐ White ☐ Black or African American
☐ American Indian or Alaska Native ☐ Asian ☐ Native Hawaiian or other Pacific Islander
35. Age (optional): _____
36. Gender (optional): ☐ Female ☐ Male ☐ Nonbinary
37. Do you consider yourself to be (optional): ☐ Heterosexual or straight ☐ Gay or Lesbian
☐ Bisexual

APPENDIX B. INTERVIEW PROTOCOL

Question Guide:

1. How are you? How are things going for you in light of the Pandemic?
2. Because your survey was done anonymously and I therefore can't connect your survey responses to you, would you briefly share a basic description of your farm so I can get a mental picture? Number of acres under production? What you produce, anything else I should know about your farm in general, unrelated to the Pandemic?
3. **Thinking of the past year—2020—how has the Pandemic impacted your farm business?** Did you make any changes in your farm business due to the Pandemic?

If so—how did you make those decisions? What were you thinking about? What were you keeping in mind? Challenges? Help?

As needed, prompt for:

- Experiences during different phases of the pandemic
 - Changes and how you made some of these decisions
 - a. Change in what grown/raised?
 - b. Change in market and marketing/customers?
 - c. Innovations/adaptations
 - Financial challenges/opportunities
 - Labor challenges/opportunities
 - Supply chain challenges?
4. **If farmer mentioned financial challenges:** You mentioned financial challenges due to the pandemic. How did you address these challenges? Did you use any federal, state or local programs that offered financial help?
 - How did you hear about the programs?
 - How did you decide if a program was a good fit for you?
 - How did it work out—that is, what was the process for you to apply and once you received the funds—thinking back—was it a smooth process? Timely? Give you what you needed? What was still missing? (impact on you?)
 - If you didn't use these federal, state or local programs that have been in the news, can you share why you did not

If the farmer did NOT mention financial challenges and, indeed, might have said that they did well financially, ask:

- Glad to hear that you didn't experience financial challenges on the farm – can you share what might have insulated you from the financial problems others experienced

5. Thinking both about possibly lasting effects of the Pandemic and unknown future challenges, what do you and other farmers - if you are comfortable speaking for farmers—need to stay viable—to stay in business?

Prompt if needed: policies? Regulations? Training opportunities? Financial supports?...

6. Many people—farmers and others—have experienced physical and/or emotional tolls from the Pandemic. Can you tell me, as a farmer, about the physical and/or emotional impact of the pandemic on you and your farm business?
7. Is there anything else you'd like to leave us with?

Food insecurity among households with children during the early months of the COVID-19 pandemic

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Abstract

Understanding impacts of the COVID-19 pandemic among households with children is necessary to design appropriate public health responses that protect food and nutrition security. The objec-

See authors' details on next page.

Authors Note

A portion of these results were presented at the 2022 International Society for Behavioral Nutrition and Physical Activity Annual Conference; the data have not been published.

Disclosures

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tive of this research was to understand predictors of food insecurity during the COVID-19 pandemic among households with at least one child (<18

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years), including whether foods reported as out-of-stock were associated with the likelihood of food insecurity. An online survey using validated measures and open-ended questions was distributed to a convenience sample in five states—Louisiana, Montana, North Carolina, Oregon, and West Virginia—during the early months of the COVID-19 pandemic (April through September of 2020). Predictors of food insecurity (race/ethnicity, age, marital status, education, federal nutrition assistance program participation, number of adults and children in the household, rurality, and missing foods when shopping) among households with children during the COVID-19 pandemic were modeled using logistic regression ($p < 0.05$, *a*

priori). To further illuminate household experiences during this time, two researchers independently coded open-ended survey question data using inductive and deductive approaches to construct themes. Households with children had increased odds of experiencing food insecurity during the COVID-19 pandemic if they had the following characteristics: Hispanic ethnicity; age between 25 and 44 years; additional adult household members; economic hardship; SNAP/WIC participation; being widowed, divorced, or separated; and reporting foods not available when shopping. Participants described mainly negative changes to dietary patterns and practices as a result of the COVID-19 pandemic. They also described food security challenges and ideas for improving food security. Consistent with other data collected and analyzed dur-

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ing the height of the COVID-19 pandemic, this study contributes findings that emphasize the need for enhanced public health responses and emergency preparedness measures that protect food and nutrition security. Because of the increased short- and long-term consequences including exposure to adverse circumstances, impaired learning, risks to mental health, and poor health outcomes, ensuring an adequate food supply is especially important for households with children.

Keywords

COVID-19, Pandemic, Food Insecurity, Food Access, Social Inequality, Households with Children

Introduction

Efforts to improve food security in the United States (U.S.) were undermined in 2020 when the novel coronavirus SARS-CoV-2 (COVID-19) caused a pandemic. Food insecurity—a deficiency in “access by all people at all times to enough food for an active, healthy life” (Bickel et al., 2000)—is estimated to affect 15 million Americans, including over 10% of U.S. children aged 0–17 years (Ullmann et al., 2022). Families living with food insecurity experience chronic anxiety, stress, and food insufficiency, which are tied to adverse health outcomes such as type 2 diabetes, hypertension, coronary heart disease, depression, and mental health challenges (Berkowitz et al., 2018; Coleman-Jensen et al., 2022; Garcia et al., 2018). Food insecurity among children is associated with adverse behavioral and academic outcomes as well as immediate and long-term risks for poor health (Perez-Escamilla & de Toledo Vianna, 2012).

Between 2015 and 2019, 9.4% of U.S. households with fewer than three children and 13.0% of households with three or more children were food insecure (Ullmann et al., 2022). In March 2020, at the start of the COVID-19 pandemic, one national survey among adults with incomes less than 250% of the federal poverty level reported that 44% of these households were food insecure, including 48% of Black households, 52% of Hispanic households, and 54% of households with children (Wolfson & Leung, 2020). Food supply issues also occurred as a result of the COVID-19 pandemic

(Byker Shanks et al., 2020), with families reporting increased stress from numerous factors that influence food access and dietary patterns such as sudden loss of employment, empty store shelves, physical isolation, and more time spent at home alone or with dependents (Grocke-Dewey et al., 2021; Parker et al., 2020; Patrick et al., 2020).

To avoid or mitigate the deleterious impacts of public health disasters, it is important to understand how the challenges of the COVID-19 pandemic influenced food and nutrition security and well-being, especially among U.S. households with children, who may be more vulnerable to impacts of disaster situations. For this report, we analyzed quantitative data to model factors associated with an increased likelihood of food insecurity and qualitative data to explore food- and nutrition-related experiences among households with at least one child under the age of 18 years during the early phase of the COVID-19 pandemic. We were also interested in the potential impact or experiential differences among households with children based on location (urban or rural).

Methods

A 52-item Qualtrics survey was created using validated measures and open-ended questions to assess impacts of the COVID-19 pandemic on nutrition, physical activity, and mental health. A convenience sample was recruited among five states (Louisiana, Montana, North Carolina, Oregon, and West Virginia), representing co-author locations and diversity in state populations and politics. Local partners, such as food pantries and public health organizations, helped to distribute survey links when applicable. Incentives for participation varied by site. Over 4,000 adults aged 18 years or older completed the survey during the early months of the COVID-19 pandemic between April 2020 and September 2020. Two published articles used this dataset to examine the impact of the COVID-19 pandemic on mental health and physical activity (Grocke-Dewey et al., 2021) and the varied nutrition practices of food-secure and food-insecure households (Byker Shanks et al., 2022).

Among the overall sample, food insecurity was reported to rise from 16% to 23% upon the onset of the COVID-19 pandemic, and households with

children were more likely to experience food insecurity (Byker Shanks et al., 2022). Because of this finding, the present investigation combined quantitative and qualitative survey data (e.g., from open-ended questions) among 1,235 households reporting at least one child under the age of 18 years. The quantitative data provided information about predictors of food insecurity, and we used the qualitative data to explore food- and nutrition-related experiences. This research was determined to be exempt from needing Institutional Review Board oversight. Details about measurement regarding the variables of interest in this study are described below. More details about this research can be found elsewhere (Byker Shanks et al., 2022; Grocke-Dewey et al., 2021).

Food Security

The six-item short form of the U.S. Department of Agriculture Economic Research Service's (USDA ERS's) Household Food Security Survey Module (Bickel et al., 2000) was used to measure household food security during the COVID-19 pandemic. To reduce participant burden amid other survey items (Byker Shanks et al., 2022; Grocke-Dewey et al., 2021), this scale was chosen over longer scale options (Bickel et al., 2000). While the six-item short form does not capture the most severe instances of food insecurity, it can be used to indicate household risk for child hunger (Bickel et al., 2000).

Predictors of Food Security Likelihood

Potential predictors of food insecurity were chosen based on historical knowledge of U.S. factors that have often influenced food insecurity (Coleman-Jensen et al., 2022): sociodemographic information (race/ethnicity, age, marital status, and education); participation in the USDA Supplemental Nutrition Assistance Program (SNAP) or Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC); the number of adults and children living in the household; and rurality. To determine rurality, zip codes were matched to rural-urban commuting area codes (RUCA; USDA ERS, 2010); RUCA values from 1 to 3 were considered urban, and RUCA codes 4–10 were considered rural. Given the food supply and access barriers

that resulted from the COVID-19 pandemic (Byker Shanks et al., 2020), responses to a survey question asking whether all foods that were needed were available when shopping (yes or no) was included as a predictor variable to model the impacts of a limited food supply among this sample, all else constant.

Qualitative Data

Open-ended survey questions on the full survey spanned a variety of broad topic areas to understand the diverse impacts of the COVID-19 pandemic on health behavior (Byker Shanks et al., 2022; Grocke-Dewey et al., 2021). Although many questions did not necessarily ask about food and nutrition security specifically (Table 1), many participants responded to these open-ended questions with information about food, nutrition, or the related topic of financial insecurity (Coleman-Jensen et al., 2022). Additionally, responses to an open-ended qualitative question, "What foods were not available [when you shopped]?" were reviewed. Food and/or beverage products noted as missing were counted, and a descriptive analysis (described below) was utilized to understand food supply challenges experienced among families during this time.

Data Analysis

Predictive Model

"Often true" or "sometimes true" affirmative responses to the USDA household food security questions were tallied. Those who responded affirmatively to two or more questions were marked as food insecure, while those who responded "never true" to five or more questions were considered food secure. Missing responses were not included. Logistic regression was used to model the association between the chosen predictor variables and the odds of experiencing food insecurity among households with children during the COVID-19 pandemic ($p < 0.05$, *a priori*).

Foods Reported Out of Stock

Food and beverage items reported not available when shopping were counted by category: fruits and vegetables; grains or grain alternatives (includ-

Table 1. Open-Ended Survey Questions Used to Explore Household Experiences with Food and Nutrition Security^a

-
- Please describe the reasons that maintaining healthy relationships with those family members that live with you has or has not been challenging for you.
 - Please describe the reasons that maintaining healthy relationships with family, friends, co-workers and your community has or has not been challenging for you.
 - If you are feeling more stressed and/or anxious since the COVID-19 pandemic began, can you explain a little more about the source of your stress and/or anxiety?
 - Do you intend to continue these positive/negative health behavior changes after the stay-at-home directive is lifted? Why or why not?
 - Is there anything policy or decision makers could do to help make it easier for you and your family to be physically and mentally healthy during the COVID-19 pandemic? Please think about how your life could be improved and make as specific recommendations as possible.
 - Is there anything else you would like to share with us in terms of how your life, or your health-related behaviors, have been impacted, or have changed, since the beginning of COVID-19?
-

^a Responses were included for qualitative analysis in the present study if relevant to food or nutrition security.

ing yeast, with the assumption it was desired for bread-making); protein (meats, fish, eggs); plant-based protein; dairy or dairy alternatives; condiments and basic ingredients; combination foods and miscellaneous items; water; and other discretionary products (alcohol, candies, etc.). The counting and categorization process was completed independently by one author (NP) and reviewed by an external research associate; discrepancies were reconciled by the lead author. Food items reported missing were compared between households with children located in urban versus rural areas, with slight differences observed for protein (25% versus 21%, respectively) and vegetable (8% versus 12%, respectively) products. Given small differences, results were combined during the analysis stage and are presented descriptively as a proportion of the total number of foods/beverages reported missing.

Qualitative Analysis

A combined deductive and inductive coding approach was used (Lichtman, 2014), based on field knowledge regarding factors that have historically influenced U.S. food security (Coleman-Jensen et al., 2022) and concepts derived from open-ended survey responses, respectively. Two researchers created and tested a codebook (BH, NP) prior to distributing it to the wider coding

team (LA, CBS, AHM, LHM, DH, TEP, JS). Participant responses were independently coded among two researchers; NP independently coded all responses with second, independent coding responsibilities split among the wider team. Agreement regarding discrepancies was reached among researchers through discussion. Codes were sorted to present the major ideas or themes in relation to food insecurity and dietary patterns during the early months of the COVID-19 pandemic. Theme prominence was compared between urban and rural households with children during the analysis stage and was combined for reporting given no observed differences between urban and rural households with children.

Results

Data from 1,235 survey respondents who reported having at least one child less than 18 years old residing in the household during the COVID-19 pandemic were included in this study.

Predictive Model

Predictors of food insecurity among households with children in this sample are shown in Table 2. Those reporting Hispanic ethnicity were 4.28 times more likely to report food insecurity compared to non-Hispanic, white respondents ($p < 0.01$). Age

was also a predictor of food insecurity; specifically, participants aged between 24 and 34 years and 35 and 44 years were 7.14 ($p < 0.01$) and 6.06 ($p < 0.05$) times more likely to report food insecurity, respectively, compared to those aged 65 and older. Marriage was associated with a reduced likelihood of food insecurity (odds ratio [OR] 0.57; $p < 0.01$), while those who reported being widowed, divorced, or separated were 2.45 times more likely to experience food insecurity ($p < 0.01$). Further, with each additional adult household member, odds for food insecurity increased (OR 1.37, $p < 0.05$). Economic hardship during the COVID-19 pandemic was associated with 4.93 times higher odds of food insecurity ($p < 0.01$); SNAP/WIC enrollment was also associated with increased odds for food insecurity (OR 3.93, $p < 0.01$). Last, food being unavailable when shopping was linked with 2.42 times higher odds of experiencing food insecurity ($p < 0.01$). Urbanicity, the number of children in the household, or education level did not predict food insecurity (Table 2, next page).

Foods Not Available When Shopping Among Households with Children

Participants ($n = 942$; 76% of the households with children sample) reported 3,104 food items as not available when shopping during the early months of the COVID-19 pandemic (Table 3). Grains were reported out-of-stock most often, followed by protein products, dairy products, and vegetables.

Qualitative Results

Open-ended survey responses about food and nutrition from 563 participants residing in households with children (46% of the sample) were analyzed for this study, given topic areas focused on food and nutrition security and/or financial insecurity. Shared experiences were grouped into three main categories or theme. They are described below

based on prominence or the number of times described (i.e., themes shown/described first were the most prominent ideas): (a) changes in dietary patterns and practices due to the COVID-19 pandemic; (b) challenges to food security; and (c) solutions to food insecurity. Exemplary quotes are used to illustrate experiences among those residing in households with children.

Changes in Dietary Patterns and Practices due to the COVID-19 Pandemic. Positive and negative changes to dietary patterns and practices were described; however, less healthy changes were emphasized most frequently. Increased feelings of stress and uncertainty or boredom and ease of access to less healthy foods and beverages were described as contributing to dietary changes because of the COVID-19 pandemic. Among many, these experiences contributed to more

Table 3. Foods Not Available When Shopping During the Early Months of the COVID-19 Pandemic ($n = 942$ respondents with at least one child less than 18 years of age)^a

Food and Beverage Products	Percent ^b
Grains (e.g., bread, grains, gluten-free alternatives)	32%
Protein (e.g., meat, fish, eggs)	23%
Dairy (e.g., milk and milk alternatives, cheese, butter)	12%
Vegetables (fresh, canned, frozen)	10%
Combination Foods (e.g., canned or boxed goods, frozen meals, soups)	7%
Fruit (fresh, canned, frozen)	6%
Condiments and Basic Ingredients (e.g., spices, sauces, sugar, oils)	6%
Plant-Based Protein (e.g., beans/legumes, tofu, vegetarian alternatives)	3%
Water	1%
Other Discretionary Products (e.g., alcohol, candy, chips, sodas)	1%

^a Percentages represent the number of reported food products out-of-stock by category divided by the total number of items reported missing ($n = 3,104$)

^b All values are rounded to the nearest integer.

Table 2. Food Insecurity Predictors among United States Households with Children During the Early Months of the COVID-19 Pandemic (*n* = 1,235 survey respondents)

	Predictor Variable	Odds Ratio	95% Confidence Limits		P-value ^a
Urbanicity ^b	Urban vs. Rural	1.24	0.91	1.69	0.18
Race/ethnicity	Hispanic vs. Non-Hispanic White	4.28	1.90	9.65	0.01
	Non-Hispanic Black vs. Non-Hispanic White	1.60	0.84	3.05	0.80
	Multiracial vs. Non-Hispanic White	1.44	0.66	3.14	0.59
	Other race vs. Non-Hispanic White	1.54	0.71	3.38	0.74
Age category	18–24 years vs. 65+ years old	3.43	0.32	36.92	0.92
	25–34 years vs. 65+ years old	7.14	0.74	68.38	0.01
	35–44 years vs. 65+ years old	6.06	0.64	57.27	0.03
	45–54 years vs. 65+ years old	3.65	0.39	34.45	0.93
	55–64 years vs. 65+ years old	3.80	0.38	38.38	0.85
Marital status	Living with a partner, but not married vs. Single or never married, and not living with a partner	0.62	0.30	1.31	0.05
	Married vs. Single or never married, and not living with a partner	0.57	0.31	1.05	<0.01
	Widowed, divorced, or separated, and not living with a partner vs. Single or never married, and not living with a partner	2.45	1.15	5.22	<0.01
Number of adults living in household	Per additional adult household member	1.37	1.14	1.63	<0.01
Number of children living in household	Per additional child household member	0.95	0.82	1.10	0.48
Economic hardship	Experienced one or more economic hardships during COVID-19 vs. No economic hardships during COVID-19	4.30	3.15	5.87	<0.01
WIC and/or SNAP participant during COVID-19	Yes vs. No	3.93	2.55	6.06	<0.01
Highest level of education	Completed 2-year junior or community college or trade school vs. Completed 4-year college or university or higher	2.06	1.33	3.20	0.50
	Completed high school or high school equivalent (GED) vs. Completed 4-year college or university or higher	1.95	1.07	3.57	0.45
	Less than high school or high school equivalent (GED) vs. Completed 4-year college or university or higher	12.11	1.20	122.73	0.10
	Some college, but no degree vs. Completed 4-year college or university or higher	2.03	1.33	3.09	0.46
Were all foods you needed available when you shopped?	No vs. Yes	2.42	1.55	3.77	<0.01

^a P-values correspond to Wald Chi-square test statistics using logistic regression.

^b As defined by rural urban commuting area (RUCA) codes (USDA ERS, 2010).

Bolded text indicates significance at a *priori* threshold ($p < 0.05$).

alcohol consumption (“I will probably continue drinking 1–2 alcoholic drinks a day until I have more secure finances and childcare” [rural Montana]), increased meal or snacking frequency (e.g., “I have been eating more and more often” [urban West Virginia]), or a shift toward more convenient food options like fast food or takeout (“Fast food was easier when I did not feel like cooking” [rural Oregon]). These changes were described as potentially lingering: “Unfortunately comfort eating is not something I have managed to ‘kick’ even after the isolation lift” (urban Louisiana).

Alternatively, some participants described healthier dietary patterns or practices because of the COVID-19 pandemic. More time and ability to cook at home, prioritize health, or establish home gardens were described as contributing factors: “Just cutting out the daily running around from work, school, etc., has given me more free time to cook” (urban Louisiana). Those having more flexibility regarding time and resources described saving money (“Saving money on eating out, wasting less” [rural Montana]). They also described weight loss despite challenges:

Our family has bonded more through the turmoil. We cook and bake together now, and we all exercise daily (even my 15-year-old daughter who didn’t exercise before). She has lost 10 pounds through this ordeal, but she did suffer with anxiety and depression in the beginning of the [stay-at-home] order. (urban Louisiana)

A small number of participants described other experiences that suggested changes in dietary patterns and practices due to the COVID-19 pandemic. The complexity of navigating multiple responsibilities related to food and caregiving were described: “Stress level can still be high due to everything falling on my shoulders. Trying to work from home, caring for children, cooking, cleaning, and just everyday chores have increased” (rural West Virginia). Also, some reported changes to food-shopping practices: “Grocery shopping takes much longer and the environment is more stressful. We go less often and buy more” (urban West Virginia).

Challenges to Food Security. Income and finances, either in general or in relation to food insecurity, were the most common challenge among households with children during the early months of the COVID-19 pandemic. A participant from rural Oregon described having “little to no money, bills overdue, no money for food, gas money to get to and from work.” Financial impacts were linked to apprehensions about providing for the household (“Loss of job wondering how to pay bills. Feeding my children” [rural Montana]) and were noted as one of several concerns (“Mentally we are all stressed. Less income, less food, scared we will get sick, no one to talk to” [urban North Carolina]).

Other issues that contravened food security included food supply interruptions and food access challenges. For example, empty store shelves (“Slightly anxious about reduced number of food items available for purchase” [urban West Virginia]; “Stressed we would not be able to find what we needed in the grocery store” [rural Montana]) and higher prices (“Our grocery bill has gone up considerably” [urban, West Virginia]) were reported. Limited food store access was also described: “Only having one grocery store in the community was a big barrier throughout this COVID situation” (rural North Carolina). However, a few respondents described being buffered from these challenges: “I am very lucky that I have not been financially impacted. At the same time, I feel that my efforts to build up savings enough to cover 3–4 months expenses gives me a great sense of comfort” (urban West Virginia).

Solutions to Food Insecurity. Some participants shared ideas for supporting their communities and families during the COVID-19 pandemic. The increased need for federal benefits, food, and financial support for struggling families, including support for childcare, were often described. A participant from rural Montana stated,

My town started offering free lunches and breakfast delivered by bus every day and it has been unbelievably helpful as a single mom with 3 kids. It often includes fresh fruit and milk and has reduced my grocery budget greatly.

The need for both public health protections to reduce the likelihood of COVID-19 transmission in food retail settings as well as a need for virtual food education materials were mentioned less frequently.

Discussion

Adding to a growing collection of research describing how the COVID-19 pandemic impacted food security, this study used data from five diverse states to explore food insecurity experiences among households with children during the early months of the COVID-19 pandemic. Results of the predictive model correspond with and amplify what is currently known about U.S. food insecurity (Coleman-Jensen et al., 2022) during the early period of the COVID-19 pandemic. Especially underscored are the challenges experienced among Hispanic-headed households with children, which is consistent with other data collected during the early months of the COVID-19 pandemic (Schanzenbach & Pitts, 2020). This observation provides further rationale for culturally and linguistically tailored food and nutrition insecurity responses for Hispanic populations, which has been discussed previously (Rodriguez et al., 2021). Novel findings of our analysis indicate food supply challenges as an additional predictor of food insecurity among households with children in the early months of the COVID-19 pandemic. As such, surveilling food supply interruptions alongside financial barriers to accessing food (Bickel et al., 2000) should be a priority to inform rapid responses. Based on the results of this research, a pragmatic new measure, developed to assess one of the core pillars of food insecurity (availability), is recommended for future application to gather geographically and culturally appropriate perceptions on available foods during public health disaster situations (Calloway et al., 2023).

This study also used qualitative responses to explore food- and nutrition-related experiences during the early months of the COVID-19 pandemic among households with children. First, data reporting out-of-stock food items helped to contextualize the quantitative findings. Grain, protein, dairy, and vegetable products were most often reported as unavailable when shopping during the

early months of the pandemic. Additional exploration of the absence of these foods would support understanding of how reduced availability impacted household purchasing and dietary patterns. Similar to our findings, there have been reports of fewer fresh fruit and vegetable purchases (Parker et al., 2021) and reduced food intake among populations experiencing food insecurity (Byker Shanks et al., 2022). These findings generate the need for additional research to ascertain the extent to which limitations in the food supply influenced the intake of fresh fruit and vegetables and other nutritious foods. For children in particular, limited access to protein and dairy sources could have measurable adverse health impacts (Moreno et al., 2015), especially when compounded by the inability to access a balanced diet with other nutrient-dense foods such as grains and vegetables (Perez-Escamilla & de Toledo Vianna, 2012).

Second, the qualitative findings provide insight into the lived experiences and coping strategies used by some families with children during the early months of the pandemic. Many respondents reported using less healthy foods or beverages as a coping mechanism for heightened stress and anxiety. Our findings reflect those reported elsewhere regarding heightened food insecurity and financial and relationship stress due to reduced income, higher expenses, and stay-at-home orders (Adams et al., 2020; Elliott et al., 2021), along with high rates of depression and anxiety (Coulthard et al., 2021; Czeisler et al., 2020; Grocke-Dewey et al., 2021) or disordered eating practices (i.e., restricting or bingeing; Coulthard et al., 2021; Phillipou et al., 2020). Results point to the pandemic's negative toll on mental health and dietary practices, which warrants further investigation. Further investigation is especially necessary for households with children, given the link between adverse childhood experiences and heightened risk for chronic health conditions, addiction, poor quality of life, and shortened life expectancy (Crandall et al., 2019). While some households with children in our sample were also able to make potentially healthier changes (Carroll et al., 2020) by gardening and preparing foods at home, this reality is likely because of a steady financial state despite challenges created by the COVID-19 pandemic (Byker Shanks et al., 2022).

Program and Policy Implications

This study used a triangulation of methods that illustrate the food insecurity challenges experienced among households with children across several states. Based on the findings of this study, and our knowledge of general lessons learned over the past few years, we discuss policy avenues to support families with children during public health disasters such as the COVID-19 pandemic. These include: a) limiting disruptions across the food supply chain; b) passing federal financial and food aid legislation in a timely manner; and c) ensuring adequate access to mental health services. Although several public health practice and policy approaches have worked to curb the negative impacts of the COVID-19 pandemic among families (described below), current data suggests families are still struggling with rising food insecurity given the expiration of supportive COVID-19 policies and rising inflation (Waxman et al., 2022). As such, our results provide critical insight into supports needed for families with children.

Early in the pandemic, supply and demand disruptions limited availability in the food environment (Byker Shanks et al., 2020). Farmers and ranchers, as well as hog and poultry processing plants, were hindered in production capacity due to concerns over worker safety (Behsudi & McCrimmon, 2020; Dyal et al., 2020). Shoppers also turned to “panic buying” to secure enough household food items (Knoll, 2020). Our data indicates these realities likely contributed to heightened food insecurity and a reduced availability of critical nutrients for households with children. The U.S. is familiar with providing food and financial support to families immediately following natural disasters (e.g., hurricanes, floods, fires, and tornadoes). However, the response to the COVID-19 pandemic was challenged by social distancing requirements and stay-at-home orders that limited the ability to both get and distribute food. For example, some participants in this study reported general anxiety about accessing food and changes to shopping patterns, in addition to a reduced food supply. A rapid response plan for addressing local, regional, and national supply chain distribution challenges is a critical consideration for the future (Byker Shanks et al., 2020) and should be designed

specifically to meet the nutritional needs of households with children.

Given heightened food and financial insecurity, other important strategies for a disaster such as the COVID-19 pandemic include passage of responsive policies like the Families First Coronavirus Response Act (FFCR; 2020), The Coronavirus Aid, Relief, and Economic Security Act (The CARES Act; 2020), Pandemic Electronic Benefits Transfer (P-EBT; USDA Food and Nutrition Service, 2020), and the expansion of the SNAP Online Purchasing Pilot (Foster et al., 2021), which all helped families. With these, however, state governments and employers experienced complications as they sought to understand legislation that aimed to support families during the COVID-19 pandemic. For future strategies, it will be important to prioritize swifter enactment, accompanied by heightened clarification. Investigations to show the extent to which these policies aided low-income households with children in achieving food, nutrition, and financial security are warranted. Last, this study found that stress and anxiety were linked to changes to food-related practices. It is important to note that mental health providers specializing in disordered eating may be difficult to access during periods of increased demand due to a limited number of professionals trained in this area (Crowther, 2021). This is problematic and should be a point of investigation for enhancing policy strategies that support families during public health disaster situations, given the interconnected nature of food, mental health, and well-being (Byker Shanks et al., 2022; Grocke-Dewey et al., 2021).

Limitations

There are several limitations of this study that should be considered. Using an online survey format excluded those without reliable internet access, although a mobile device could have been used. This method of data collection was prioritized during a time when in-person recruitment was less possible. Also, while the convenience sampling in partnership with community partners in varied state settings helped to overcome data collection challenges during this time, the use of convenience sampling introduces bias into the sample. Results cannot be generalized to reflect

the experiences of all U.S. households with children in these locations. The timeframe of our study, which was cross-sectional and took place during the early months of the COVID-19 pandemic is also a limitation. The results may not reflect the situations of households with children at later points when federal aid increased to better support families.

Last, while we limit our analysis to households reporting at least one child during the COVID-19 pandemic, we cannot draw conclusions about how children were impacted by reported challenges. Use of the abbreviated USDA food security scale could only indicate heightened risk for child hunger among households reporting food insecurity (Bickel et al., 2000). Our quantitative analysis indicated having additional adults in the households

was predictive of food insecurity, while having additional children was not. Adult household members are likely to restrict food intake to protect child food security (Bickel et al., 2000), and this may explain our findings. This exploratory investigation used both quantitative and qualitative data to identify vulnerabilities among households with children. Future research and practice evidence is required to fully understand the impact of public health disasters to inform emergency preparedness strategies that mitigate impact, particularly among child populations.

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References

- Adams, E. L., Caccavale, L. J., Smith, D., & Bean, M. K. (2020). Food insecurity, the home food environment, and parent feeding practices in the era of COVID-19. *Obesity*, 28(11), 2056–2063. <https://doi.org/10.1002/oby.22996>
- Behsudi, A., & McCrimmon, R. (2020, April 5). Food goes to waste amid coronavirus crisis. *Politico*. <https://www.politico.com/news/2020/04/05/food-waste-coronavirus-pandemic-164557>
- Berkowitz, S. A., Basu, S., Meigs, J. B., & Seligman, H. K. (2018). Food insecurity and health care expenditures in the United States, 2011–2013. *Health Services Research*, 53(3), 1600–1620. <https://doi.org/10.1111/1475-6773.12730>
- Bickel, G., Nord, M., Price, C., Hamilton, W., & Cook, J. (2000). *Guide to measuring household food security*. U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation. <https://www.fns.usda.gov/guide-measuring-household-food-security-revised-2000>
- Byker Shanks, C., Hingle, M. D., Parks, C. A., & Yaroch, A. L. (2020). The COVID-19 pandemic: A watershed moment to strengthen food security across the US food system. *American Journal of Public Health*, 110(8), 1133–1134. <https://doi.org/10.2105/AJPH.2020.305760>
- Byker Shanks, C., Houghtaling, B., Shanks, J., Grocke-Dewey, M., Webber, E., Andress, L., Hardison-Moody, A., Patton-Lopez, M., & Haynes-Maslow, L. (2022). Disparities in dietary practices during the COVID-19 pandemic by food security status. *Preventive Medicine Reports*, 28, Article 101830. <https://doi.org/10.1016/j.pmedr.2022.101830>
- Calloway, E. E., Carpenter, L. R., Gargano, T., Sharp, J. L., & Yaroch, A. L. (2023). New measures to assess the “other” three pillars of food security—Availability, utilization, and stability. *International Journal of Behavioral Nutrition and Physical Activity*, 20(1), Article 51. <https://doi.org/10.1186/s12966-023-01451-z>
- Carroll, N., Sadowski, A., Laila, A., Hruska, V., Nixon, M., Ma, D. W. L., Haines, J., & Guelph Family Health Study (2020). The impact of COVID-19 on health behavior, stress, financial and food security among middle to high income Canadian families with young children. *Nutrients*, 12(8), Article 2352. <https://doi.org/10.3390/nu12082352>
- Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2022). *Household food security in the United States in 2021*. U.S. Department of Agriculture, Economic Research Service. <https://www.ers.usda.gov/publications/pub-details/?pubid=104655>
- Coronavirus Aid, Relief, and Economic Security Act, Pub. L. 116–36 (2020). <https://www.govinfo.gov/app/details/PLAW-116publ136>
- Coulthard, H., Sharps, M., Cunliffe, L., & van den Tol, A. (2021). Eating in the lockdown during the Covid 19 pandemic: Self-reported changes in eating behaviour, and associations with BMI, eating style, coping and health anxiety. *Appetite*, 161, Article 105082. <https://doi.org/10.1016/j.appet.2020.105082>

- Crandall, A., Miller, J. R., Cheung, A., Novilla, L. K., Glade, R., Novilla, M. L. B., Magnusson, B. M., Leavitt, B. L., Barnes, M. D., & Hanson, C. L. (2019). ACEs and counter-ACEs: How positive and negative childhood experiences influence adult health. *Child Abuse & Neglect*, 96, Article 104089. <https://doi.org/10.1016/j.chiabu.2019.104089>
- Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., Weaver, M. D., Robbins, R., Facer-Childs, E. R., Barger, L. K., Czeisler, C. A., Howard, M. E., & Rajaratnam, S. M. W. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *Morbidity and Mortality Weekly Report*, 69(32), 1049–1057. <https://doi.org/10.15585/mmwr.mm6932a1>
- Dyal, J. W., Grant, M. P., Broadwater, K., Bjork, A., Waltenburg, M. A., Gibbins, J. D., Hale, C., Silver, M., Fischer, M., Steinberg, J., Basler, C. A., Jacobs, J. R., Kennedy, E. D., Tomasi, S., Trout, D., Hornsby-Myers, J., Oussayef, N. L., Delaney, L. J., Patel, K., Shetty, V., ... Honein, M. A. (2020). COVID-19 among workers in meat and poultry processing facilities—19 states, April 2020. *Morbidity and Mortality Weekly Report*, 69(18), 557–561. <https://doi.org/10.15585/mmwr.mm6918e3>
- Elliott, S., Satterfield, S. J., Solorzano, G., Bowen, S., Hardison-Moody, A., & Williams, L. (2021). Disenfranchised: How lower income mothers navigated the social safety net during the COVID-19 pandemic. *Socius*, 7. <https://doi.org/10.1177/23780231211031690>
- Families First Coronavirus Response Act. Pub. L. 116–27. (2020). <https://www.govinfo.gov/app/details/PLAW-116publ127>
- Foster, I., Polselli, A., Hoffs, C., de Nocker, C., LeBoa, C., Rummo, P., Brandt, E. J., & Rimm, E. (2021, February 10). *Understanding nationwide uptake: An analysis of the newly expanded SNAP online purchasing program during 2020*. unBox. <https://www.unboxproject.org/snap-online-purchasing-brief>
- Garcia, S. P., Haddix, A., & Barnett, K. (2018). Incremental health care costs associated with food insecurity and chronic conditions among older adults. *Preventing Chronic Disease*, 15, Article 180058. <https://doi.org/10.5888/pcd15.180058>
- Grocke-Dewey, M., Hardison-Moody, A., Haynes-Maslow, L., Maras, S., Webber, E., Andress, L., Houghtaling, B., Patton-Lopez, M., Shanks, J., & Byker-Shanks, C. (2021). Examining the relationship between physical activity and mental health during the COVID-19 pandemic across five U.S. States. *Preventive Medicine Reports*, 24, Article 101537. <https://doi.org/10.1016/j.pmedr.2021.101537>
- Knoll, C. (2020, March 13). Panicked shoppers empty shelves as coronavirus anxiety rises. *New York Times*. <https://www.nytimes.com/2020/03/13/nyregion/coronavirus-panic-buying.html>
- Lichtman, M. (2014). *Qualitative research for the social sciences*. SAGE Publications.
- Moreno, L. A., Bel-Serrat, S., Santaliestra-Pasías, A., & Bueno, G. (2015). Dairy products, yogurt consumption, and cardiometabolic risk in children and adolescents. *Nutrition Reviews*, 73(Suppl. 1), 8–14. <https://doi.org/10.1093/nutrit/nuv014>
- Parker, K., Horowitz, J. M., Brown, A. (2020, April 21). *About half of lower-income Americans report household job or wage loss due to COVID-19*. Pew Research Center. <https://www.pewresearch.org/social-trends/2020/04/21/about-half-of-lower-income-americans-report-household-job-or-wage-loss-due-to-covid-19/>
- Parker, M. K., Hedrick, V. E., Hedges, S., Borst, E., Ledlie Johnson, M., Best, M. M., & Misyak, S. A. (2021). SNAP participants' purchasing patterns at a food co-op during the COVID-19 pandemic: A preliminary analysis. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 147–156. <https://doi.org/10.5304/jafscd.2021.102.043>
- Patrick, S. W., Henkhaus, L. E., Zickafoose, J. S., Lovell, K., Halvorson, A., Loch, S., Letterie, M., & Davis, M. M. (2020). Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics*, 146(4), Article e2020016824. <https://doi.org/10.1542/peds.2020-016824>
- Perez-Escamilla, R., & Pinheiro de Toledo Vianna, R. (2012). Food insecurity and the behavioral and intellectual development of children: A review of the evidence. *Journal of Applied Research on Children*, 3(1), Article 9. <https://digitalcommons.library.tmc.edu/childrenatrisk/vol3/iss1/9>

- Phillipou, A., Meyer, D., Neill, E., Tan, E. J., Toh, W. L., Van Rheenen, T. E., & Rossell, S. L. (2020). Eating and exercise behaviors in eating disorders and the general population during the COVID-19 pandemic in Australia: Initial results from the COLLATE project. *International Journal of Eating Disorders*, 53(7), 1158–1165. <https://doi.org/10.1002/eat.23317>
- Rodriguez, C., Crowder, S. L., Rodriguez, M., Redwine, L., & Stern, M. (2021). Food insecurity and the Hispanic population during the COVID-19 pandemic. *Ecology of Food and Nutrition*, 60(5), 548–563. <https://doi.org/10.1080/03670244.2021.1974014>
- Schanzenbach, D. W., & A. Pitts. (2020, July 9). *Food insecurity during COVID-19 in households with children: Results by racial and ethnic groups*. Institute for Policy Research, Northwestern University. <https://www.ipr.northwestern.edu/documents/reports/ipr-rapid-research-reports-pulse-hh-data-9-july-2020-by-race-ethnicity.pdf>
- Ullmann, H., Weeks, J. D., & Madans, J. H. (2022). *Children living in households that experienced food insecurity: United States, 2019–2020* (NCHS Data Brief No. 432). Centers for Disease Control and Prevention. <https://dx.doi.org/10.15620/cdc.113966>
- U.S. Department of Agriculture, Economic Research Service. (2010). *Rural-urban commuting area codes*. <https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx>
- U.S. Department of Agriculture, Food and Nutrition Service. (2020). *State guidance on Coronavirus P-EBT*. <https://www.fns.usda.gov/snap/state-guidance-coronavirus-pandemic-ebt-pebt>
- Waxman, E., Salas, J., Gupta, P., & Karpman, M. (2022, September 28). *Food insecurity trended upward in midst of high inflation and fewer supports*. Urban Institute. <https://www.urban.org/research/publication/food-insecurity-trended-upward-midst-high-inflation>
- Wolfson, J. A., & Leung, C. W. (2020). Food insecurity and COVID-19: Disparities in early effects for US adults. *Nutrients*, 12(6), Article 1648. <https://doi.org/10.3390/nu12061648>

A snapshot of nutrition incentive adaptation during COVID-19: Consensus-building with practitioners

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Abstract

Exacerbated food insecurity has been among the many challenges presented by the emergence of the novel coronavirus 2019 in the United States. In the wake of the pandemic, expanded focus has turned to the capacities of established federal nutrition assistance programs and emergent nutrition access models to address these challenges. Supplemental Nutrition Assistance Program-based incentive programs, or nutrition incentive programs, are an

emergent model designed to provide financial incentives (additional funds) to limited-resource, Supplemental Nutrition Assistance Program (SNAP)-enrolled shoppers to improve the affordability of fresh fruits and vegetables at farm-direct and other retail outlets. While policymakers, researchers, and other stakeholders have advanced efforts to evaluate the overall impact and efficacy of nutrition incentive programs, much remains to be understood about how these programs operate under pandemic conditions and how effective they

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have been at mitigating the associated increase in food hardship for limited-resource families.

To examine the salient factors influencing nutrition incentive program operations during the pandemic, we applied a three-round, online Delphi process with an expert panel ($N=15$) of nutrition incentive practitioners between May and October 2021, analyzing the data using thematic analysis and descriptive statistics. The panelists reached consensus on several barriers, opportunities, and innovative adaptations in incentive programming operations, both in the early stages of the pandemic outbreak and that may persist long-term. The findings—which include barriers such as “staff burnout and/or turnover,” opportunities such as “increased collaboration and networking between stakeholders,” and innovative adaptations such as “targeted expansion of SNAP/EBT eligibility”—have implications for the operational and adaptive capacities of SNAP-based incentive program practitioners over the next several years. We provide recommendations for both researchers and nutrition incentive practitioners with an emphasis on further exploring and operationalizing the long-term barrier, opportunity, and innovative adaptation findings to aid the continued development of nutrition incentive program resilience in preparation for future pandemic events or comparable food system shocks.

Keywords

Adaptation, Consensus, COVID-19, Pandemic, Delphi, Food Access, Food Insecurity, Nutrition Incentives, SNAP, GusNIP

Introduction and Literature Review

Food Insecurity in the Pandemic Era

In the spring of 2020, COVID-19 disrupted the global food system. A destabilized food system was the consequence not only of the virus itself but of a series of policies issued to slow its spread, including lockdown mandates and related mobility restriction measures at the federal, state, and local level (Bender et al., 2022; Weersink et al., 2021). Early stay-at-home orders induced widespread layoffs and furloughs across multiple sectors, which preceded food business closures, consumer panic buying and product stockpiling, inflated food

prices, and intensified reliance on emergency food assistance services, such as food banks (Campbell, 2021; Niles et al., 2020; Ziliak, 2021).

Of the pandemic's many adverse impacts on stakeholders within the food system—including food retail employers, food-service workers, and agricultural producers—the increase in food insecurity provoked prominent concern from public health practitioners, policymakers, researchers, and food justice advocates alike (Ahn & Norwood, 2021; Bender et al., 2022; Campbell, 2021). Food insecurity, broadly defined as the restricted or disrupted access to sufficiently nutritious food for an individual or household due to the lack of financial resources, is a long-recognized metric of both acute and chronic economic distress in the U.S., and also one of the most significant public health issues under consideration by experts (Ahn & Norwood, 2021; Gundersen & Ziliak, 2018; Lewis et al., 2021). As evidenced by surges in emergency food use, enrollment in nutrition assistance programs, and self-reported rates of food hardship in at-risk populations (such as seniors or communities of color), food insecurity worsened in 2020, aggravated both by the virus and subsequent measures implemented to mitigate its impact (Ahn & Norwood, 2021; Fitzpatrick et al., 2021; Gundersen et al., 2021; Schanzenbach & Pitts, 2020; Siddiqi et al., 2021; Ziliak, 2021).

Recognizing the severity of food insecurity risks due to COVID-19, food system stakeholders in the United States increased their focus on the capacities of established nutrition assistance programs such as the Supplemental Nutrition Assistance Program (SNAP), as well as emerging programs such as Produce Prescription Programs and SNAP-based incentive programs (SBIPs; John et al., 2021; Parks, Mitchell et al., 2021). SBIPs, also known as nutrition incentive programs, have been particularly strongly advocated for as a critical nutrition intervention model to combat food insecurity “post-COVID” (John et al., 2021; Parks, Han et al., 2021).

SBIPs: Structure, Scope, and Operational Impacts During the Pandemic

SBIPs aim to reduce or eliminate financial barriers to fresh fruits and vegetables (FF&Vs) by provid-

ing SNAP-enrolled individuals with “immediate price discounts on produce purchased with SNAP” (Parks et al., 2019, p. 395). Conceived initially as local pilot interventions to help limited-resource shoppers afford cost-prohibitive fruits and vegetables at farm-direct outlets (FDOs) such as farmers markets, SBIPs have quickly spread and evolved, expanding into brick-and-mortar retail spaces such as grocery stores, and featuring product eligibility allowances beyond FF&Vs (John et al., 2021; Parks, Mitchell et al., 2021; Parks et al., 2020). Experiencing rapid growth and development, with widespread implementation across the country and burgeoning coalitions co-creating and disseminating best practices, SBIPs reflect an emergent and adaptable nutrition assistance intervention model (John et al., 2021). Given the still-emergent status of SBIPs in the U.S., there remains significant variation across program characteristics such as outlet type, geographic focus or scale, methods for incentive distribution and redemption (e.g., enrollment requirements), product redemption eligibility, and amount of incentive match offered (Engel et al., 2020; Parks et al., 2020). While farmers markets have been the primary provider outlet for SBIPs, eligible outlets also include grocery stores (typically smaller-scale, independent grocers, or food cooperatives), convenience or corner stores, farm stands, mobile markets, and community supported agriculture (CSA) subscriptions (Parks et al., 2020).

Predictably, COVID-19’s spread significantly complicated SBIP operations in the U.S. While nutrition incentive practitioners experienced substantial operational changes due to statewide and municipal emergency response orders (e.g., lockdowns), key operational changes were also triggered by targeted pandemic response actions from U.S. Department of Agriculture Food and Nutrition Service (USDA FNS; USDA FNS, n.d.-a). In the two years following the initial onset of COVID-19, the USDA FNS authorized a series of adaptations, or “key flexibilities,” to SNAP/ Electronic Benefits Transfer (EBT) implementations at the state level. These waiver actions included approval for states to issue emergency supplements to SNAP households (i.e., emergency allotments), Pandemic-EBT (P-EBT) allowances for states to offer benefits to households with children who

qualify for free or reduced school meals, expanded support for SNAP Online Purchasing, and much more (USDA FNS, n.d.-b).

Of these flexibilities, implementing P-EBT may have affected nutrition incentive providers (particularly farm-direct outlet operators) most directly within the first several months of the pandemic. Originally authorized under the Families First Coronavirus Response Act of 2020, P-EBT offers temporary emergency nutrition benefits for children who would have otherwise received free or reduced-price meals under the National School Lunch Act if their schools were not closed or forced to reduce operating hours (Balasuriya et al., 2021; USDA FNS, n.d.-b). With benefits loaded onto qualifying individuals’ existing EBT cards, P-EBT is compatible with the nutrition incentive redemption process and has been eligible for incentive matches (the “doubling” of EBT funds) in various states across the country (Double Up Arizona, 2020; Feeding Florida, n.d.; Sustainable Food Center, n.d.).

Finally, another significant impact to SBIP operations involved a US\$75 million appropriation authorized by USDA National Institute of Food and Agriculture (NIFA) in the spring of 2021. The Gus Schumacher Nutrition Incentive Program (GusNIP) COVID Relief and Response grants program (GusCRR) assists GusNIP grantees (SBIP providers) with their efforts to target vulnerable, limited-resource communities with additional pandemic relief (USDA, 2021). GusCRR grants have expanded the scope of work established under previous GusNIP awards to “address pandemic relief and respond to community needs in an impactful, timely, and authentic way” (USDA, 2021, para. 10). There is inconclusive evidence regarding how GusCRR has affected SBIP outcomes, signifying an opportunity for researchers to expand academic focus on evaluating SBIP efficacy.

The stability and adaptive capacity of SBIPs has become a vital area of inquiry since COVID-19’s arrival in the U.S., and there is currently a lack of research emphasis on assessing the “on the ground” conditions of incentive program implementation, administration, and evaluation, as well as the experiences and perceptions of the practitioners, providers, and shoppers so central to those

processes (Garner et al., 2020). The limited examples of these process-oriented explorations have demonstrated value by providing a contextually grounded richness of data not typically found in outcome-focused impact assessments (Garner et al., 2020; Gusto et al., 2020; Savoie Roskos et al., 2017). The perspectives and expertise of SBIP practitioners—including FDO operators, technical assistance administrators, and regional program coordinators—became even more crucial after COVID-19's arrival, given the tumultuous and rapidly shifting SBIP operating conditions (Parker et al., 2021; Parks et al., 2021b).

Purpose and Objectives

To better understand how COVID-19 impacted and continues to impact SBIP operations across the country, we centered the expertise of a panel of SBIP practitioners who implement, administer, and evaluate of SBIPs across different regions in the U.S. The purpose of this study was to leverage practitioner expertise to identify and reach consensus on the barriers, opportunities, and innovative adaptations believed to be the most influential to SBIP operating conditions and adaptive capacities (the capacities of SBIP practitioners to adapt to system disruptions and mobilize newly learned best practices to improve overall system functioning) during, and beyond, the COVID-19 pandemic (Barasa et al., 2018). Three objectives guided this effort:

1. Identify and formalize an expert panel through an intentional and structured sampling procedure.
2. Collect, synthesize, and refine participant responses across data analysis rounds by applying validated consensus thresholds.
3. Assess results from third-round data collection to determine if consensus was achieved among the panelists.

By applying the Delphi technique with this expert panel, we were able to reach consensus on the most salient barriers, opportunities, and innovative adaptations affecting SBIP operations across both the early and latter stages of the COVID-19 pandemic. Our findings generated a snapshot of

the conditions SBIP practitioners faced on the ground during COVID-19, with implications for how SBIP operational and adaptive capacities may evolve over the next few years.

Applied Research Methods

Design Overview

We facilitated a three-round Delphi technique approach remotely between February and October 2021 with a panel of experts (SBIP practitioners) operating in various states across the U.S. The Delphi technique is a long-established technique to develop and achieve expert-based consensus on a complex issue (Drumm et al., 2022; Niederberger & Spranger, 2020). Applied when “available knowledge is incomplete or subject to uncertainty” or when the aggregation and integration of diverse, emergent, and specialized knowledge are deemed critical, the classical Delphi technique typically involves an iterative, three-round procedure that begins with an open-ended elicitation round followed by two close-ended survey rounds that prompt the panelists to rate or rank items generated from round one (Brady, 2015; Linstone et al., 2002; Niederberger & Spranger, 2020, p. 1). In this study, we adapted the classical Delphi design format for virtual, remote facilitation with expert panelists, deploying each of the three rounds via Qualtrics, an online survey platform (Version 2021).

Soon after the University of Florida Institutional Review Board (IRB) approved this study (#IRB202100382) in late February 2021, we targeted prospective panelists for their knowledge of and experience with multiple elements of SBIP operations, including program implementation at FDOs and other retail providers, administrative and technical assistance protocols for incentive providers, and prevailing SBIP evaluation (i.e., impact assessment) norms. We initially identified 60 eligible individuals through prominent SBIP coalitions organizations such as the Nutrition Incentive Hub, the Farmers Market Coalition, and Wholesome Wave, as well as through publicly listed GusNIP grantees across all qualifying project types (e.g., pilot projects, standard projects, and large-scale projects; USDA NIFA, n.d.). We sent emails to 60 candidates, inviting them to participate

in an introductory phone call to share the study's objectives and participation expectations. In addition to this purposive outreach, several individuals who agreed to participate in the study also helped to identify additional candidates. This supplemental snowball sampling technique helped to meet our target panel threshold for this study (a minimum of 15 members), accounting for individuals who did not respond to initial outreach attempts, and for individuals who initially agreed to participate but later opted out due to scheduling conflicts (Naderifar et al., 2017; C. Parker et al., 2019). The final expert panel included 20 adult individuals representing a range of organization types and professional roles, including directors of statewide farmers market associations, administrative personnel at nationally focused SBIP organizations, and SBIP program coordinators at principal provider organizations in a given state or region.

Data collection

Round one

After consenting to participate in the study, the panelists ($N=20$) completed the first-round survey in early summer 2021. We prompted the panelists to respond to three open-ended question sets regarding their perceptions of the operational and adaptive capacities of SBIPs in the aftermath of COVID-19's emergence and spread in the U.S. Following two screening questions included to clarify the roles and characteristics of the organizations represented, we asked the panelists to provide feedback to three primary question sets regarding how SBIP practitioners operate during, and potentially beyond, the pandemic. These question sets, or constructs, included barriers, opportunities, and innovative adaptations. We invited the panelists to provide examples of each construct across two distinct time horizons: those that were salient or impactful in the early stages of COVID-19's emergence (early spring through late summer 2020) and those believed to be most likely to remain impactful over the long term (over the next several years). The panelists responded to each construct in both list and descriptive, long-response format. Table 1 depicts these constructs and time horizon categories.

Round two

Round two involved the distribution of a quantitative instrument to the panelists to collect ratings of all items synthesized from the first round's qualitative feedback (Drumm et al., 2022; Niederberger & Spranger, 2020). Four panelists could not continue their involvement in this round due to various personal circumstances unrelated to the study, resulting in a 16-member panel for round two. We presented the panelists with a set of item-statements for each construct (barriers, opportunities, and innovative adaptations) compiled from our thematic analysis (more detail about that step is below) of the first-round feedback. We additionally organized items for each construct into two distinct time horizons, requesting the panelists to rate how salient or impactful each item was in the early stages of the COVID-19 outbreak or would be over the long term. We used separate response scales to reflect the distinct chronologies between items. All early-stage items, which we situated as past dynamics (barriers, opportunities, or innovative adaptations) within SBIP operations, were rated by the panelists using a five-point Likert agreement scale (1=strongly disagree; 5=strongly agree). Long-term items across each construct, which we positioned as potential future dynamics in SBIP practice, were rated using a five-point Likert likelihood scale (1=extremely unlikely; 5=extremely likely).

Round three

The third and final survey round mirrored round two's format, with a change in response-scale design as a notable exception. We prompted the panelists ($N=15$) to rate all items that progressed from round two by achieving two-thirds consen-

Table 1. Constructs and Time Horizon Categories

Constructs	Time Horizons
Barriers	Early-stage barriers
	Long-term barriers
Opportunities	Early-stage barriers
	Long-term opportunities
Innovative Adaptations	Early-stage adaptations
	Long-term adaptations

sus, a consensus threshold commonly applied in Delphi studies (Drumm et al., 2022; Niederberger & Spranger, 2020). Using a seven-point Likert agreement scale (1=strongly disagree; 7=strongly agree) for all early-stage items, and a seven-point Likert likelihood scale (1=extremely unlikely; 7=extremely likely) for all long-term items, the panelists provided final appraisals of the impact of all remaining barriers, opportunities, and innovative adaptations to the operational conditions and capacities of SBIPs on the ground.

Data Analysis

Round one

We analyzed qualitative data generated from round one's elicitation questions using open, axial, and selective coding techniques (Glaser & Strauss, 1967). The lead analyst applied these techniques to break down, examine, compare, and group raw, discrete snippets of data until representative themes (codes) emerged to be further subjected to comparison and scrutiny by the rest of the research team (Bernard et al., 2016; Glaser & Strauss, 1967). We performed the analysis in NVivo, a qualitative analysis program (Version 12). We applied select techniques to address potential concerns about the credibility ("truth"), transferability (applicability), dependability (consistency and repeatability), and the confirmability (neutrality) of findings—such as audit trail reporting, peer debriefing, and analyst triangulation (Connelly, 2016; Kyngäs et al., 2019; Lincoln & Guba, 1985).

Rounds two and three

We analyzed survey data from rounds two and three using simple descriptive statistics in SPSS (Version 27). This is a technique frequently applied in Delphi studies to verify that items under consideration meet an identified consensus threshold (Drumm et al., 2022; Lange et al., 2020). To advance to the third and final round, we required that all early-stage round-two items under consideration (early-stage barriers, opportunities, and innovative adaptations) meet a two-thirds consensus threshold, whereby approximately 67% of the panelists rated a given item either a 4 ("somewhat agree") or a 5 ("strongly agree"). Similarly, we

required that all long-term barrier, opportunity, and innovative adaptation items analyzed from round two data meet the ~67% consensus threshold to advance to round three. Each item required two-thirds of the panelists to provide a rating of either 4 ("somewhat likely") or 5 ("extremely likely").

In round three, we similarly determined consensus by calculating the panelists' rating frequencies and percentages for each item across all question sets. In this round, however, we applied this procedure to appraise expanded response scales, given that round three featured seven-point, rather than five-point, Likert scales. Where two-thirds of the panelists selecting either "somewhat agree/strongly agree" or "somewhat likely/extremely likely" qualified an early-stage or long-term second-round item for advancement, an item achieving consensus in round three required that ~67% of the panelists rated it a 6 ("agree"/"moderately likely") or 7 ("strongly agree"/"extremely likely"). These response scale and scoring modifications were implemented to capture greater nuance in the panelists' perceptions of the items under consideration and more precisely reflect their views in the final round.

Results

Given the volume of data collected, we present results for rounds one and two of the Delphi study only in brief below, recounting themes the panelists initially identified (round one) and subsequently rated (round two) across six eligible categories: early-stage and long-term barriers, early-stage and long-term opportunities, and early-stage and long-term innovative adaptations. We describe round three's final consensus results in greater detail, supported by result tables illustrating the panelists' item ratings across all categories.

Round One

The panelists' (N=20) qualitative feedback generated 28 unique barrier themes, including 14 early-stage barriers (barriers to the operational capacities of SBIPs in the early stages of the COVID-19 outbreak in the U.S.), and 14 long-term barriers (barriers perceived to adversely impact the operational capacities of SBIPs over the next several years). The panelists identified nine opportunity themes,

including six early-stage opportunities (opportunities influential to SBIP operational capacities in the early stages of the COVID-19 outbreak in the U.S.) and three long-term opportunities (opportunities that may help influence SBIP success and resilience over the next several years). Finally, the panelists' responses produced 11 innovative adaptation themes, including seven early-stage innovative adaptations (adaptations most influential to the operational capacities of SBIPs in the early stages of the COVID-19 outbreak in the U.S.), and four long-term innovative adaptation (adaptations perceived to be most likely to influence the operational capacities of SBIPs over the next several years).

Round Two

Out of 28 reviewed barrier items, 13—including eight early-stage items and five long-term items—achieved panel consensus and were advanced to round three. Eight opportunity items—five of the six early-stage opportunities under consideration, and all three of the possible long-term opportunities—met the consensus threshold and qualified

for round three. Finally, eight innovative adaptation items—six early-stage items and two long-term items—attained consensus and were advanced to the third and final round.

Round Three

Table 2 displays the frequencies and percentages for the panelists' ($N=15$) ratings of each early-stage barrier item under consideration. Only one early-stage barrier item, "Lack of Access to SNAP online and/or online ordering systems," qualified for consensus.

Of the five long-term barrier items rated using the seven-point likelihood scale, one item, "Staff burnout and/or turnover," achieved final panel consensus. Table 3 shows the panelists' rating frequencies (and percentages) for each long-term barrier item.

Table 4 shows the frequency and rounded percentage selection rates for each early-stage opportunity item, with asterisks marking the items that attained final consensus. All five early-stage opportunity items reviewed by the panelists met final consensus, with one item, "Increased consumer

Table 2. Agreement Ratings for Final Early-Stage Barrier Items

Early-stage barrier item	Likert response scale-points							Combined agreement %
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	
Implementation of new safety protocols, guidelines, and market standards	0 (0.0%)	0 (0.0%)	2 (13.3%)	0 (0.0%)	6 (40.0%)	1 (6.7%)	9 (56.3%)	63.0%
Inadequate staffing support	0 (0.0%)	0 (0.0%)	2 (13.3%)	0 (0.0%)	4 (26.7%)	4 (26.7%)	5 (33.3%)	60.0%
Increased complexities with data collection and reporting	0 (0.0%)	0 (0.0%)	1 (6.7%)	0 (0.0%)	7 (46.7%)	4 (26.7%)	3 (20.0%)	46.7%
Lack of access to SNAP online and/or online ordering systems	0 (0.0%)	1 (6.7%)	1 (6.7%)	1 (6.7%)	2 (13.3%)	1 (6.7%)	9 (60.0%)	67.0% ^a
Issues with adapting to SNAP online and/or online ordering systems	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (40.0%)	3 (20.0%)	2 (13.3%)	4 (26.7%)	40.0%
Program promotion and communication challenges with SNAP clientele	0 (0.0%)	1 (6.7%)	2 (13.3%)	1 (6.7%)	5 (33.3%)	5 (33.3%)	1 (6.7%)	40.0%
Reduced transportation access for consumers	0 (0.0%)	0 (0.0%)	2 (13.3%)	4 (26.7%)	3 (20.0%)	3 (20.0%)	3 (20.0%)	40.0%
Reduced access to programing due to FDO closures and/or operation restrictions	1 (6.7%)	1 (6.7%)	1 (6.7%)	1 (6.7%)	3 (20.0%)	2 (13.3%)	6 (40.0%)	53.3%

^a Item met the final consensus threshold

Table 3. Likelihood Ratings for Final Long-Term Barrier Items

Long-term barrier item	Likert response scale-points							Combined likelihood %
	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)	
Increased complexities with data collection and reporting	2 (13.3%)	2 (13.3%)	1 (6.7%)	2 (13.3%)	3 (20.0%)	4 (26.7%)	1 (6.7%)	33.4%
Lack of access to SNAP online and/or alternative program models	0 (0.0%)	2 (13.3%)	3 (20.0%)	1 (6.7%)	1 (6.7%)	3 (20.0%)	5 (33.3%)	53.3%
Issues with adapting to SNAP online and/or online ordering systems	0 (0.0%)	0 (0.0%)	4 (26.7%)	1 (6.7%)	2 (13.3%)	5 (33.3%)	3 (20.0%)	53.3%
Outreach challenges to limited resource/marginalized communities	1 (6.7%)	2 (13.3%)	1 (6.7%)	1 (6.7%)	5 (33.3%)	4 (26.7%)	1 (6.7%)	33.4%
Staff burnout and/or turnover	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (33.3%)	6 (40.0%)	4 (26.7%)	66.7% (67%) ^a

^a Item met the final consensus threshold**Table 4. Agreement Ratings for Final Early-Stage Opportunity Items**

Early-stage opportunity item	Likert response scale-points							Combined agreement %
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	
Increased consumer appreciation for small businesses	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (13.3%)	1 (6.7%)	4 (26.7%)	8 (53.3%)	80.0% ^a
Increased collaboration and networking between stakeholders	0 (0.0%)	0 (0.0%)	1 (6.7%)	0 (0.0%)	2 (13.3%)	8 (53.3%)	4 (26.7%)	80.0% ^a
Increased consumer interest in using SNAP and/or nutrition incentives for fruits and vegetables, food producing plants, and seeds	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (13.3%)	13 (86.7%)	100.0% ^a
Renewed stakeholder interest in structural inequities and access in the food system	0 (0.0%)	1 (6.7%)	1 (6.7%)	1 (6.7%)	3 (20.0%)	8 (53.3%)	4 (26.7%)	80.0% ^a
Renewed consumer interest in FDOs and/or local food	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (6.7%)	0 (0.0%)	6 (40.0%)	8 (53.3%)	93.3% ^a

^a Item met the final consensus threshold

interest in using SNAP and/or nutrition incentives...,” achieving unanimous agreement among the panelists.

Table 5 presents the panelists’ rating results for all long-term opportunity items. Of the three items under consideration, only “Sustained collaboration and networking between stakeholders” met the final consensus threshold.

Table 6 depicts the frequency and percentage of the panelists’ ratings for each early-stage innova-

tive adaptation item, where two-thirds of the panelists rating either a 6 (“agree”) or 7 (“strongly agree”) qualified an item for final consensus. Two early-stage innovative adaptation items ultimately achieved consensus: “Deliberate redesign of physical spaces at FDOs” and “Targeted expansion of SNAP/EBT eligibility.”

Table 7 shares the panelists’ rating results for likelihood that two remaining innovative adaptation items (“Continued use of community-based

Table 5. Likelihood Ratings for Final Long-Term Opportunity Items

Long-term opportunity item	Likert response scale-points							Combined likelihood %
	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)	
Sustained collaboration and networking between stakeholders	0 (0.0%)	0 (0.0%)	1 (6.7%)	1 (6.7%)	2 (13.3%)	6 (40.0%)	5 (33.3%)	73.3% ^a
Sustained funding and/or resource support from federal and state legislatures	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (13.3%)	5 (33.3%)	6 (40.0%)	2 (13.3%)	53.3%
Sustained stakeholder interest in structural inequities and access in the food system	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (40.0%)	5 (33.3%)	4 (26.7%)	60.0%

^a Item met the final consensus threshold

Table 6. Agreement Ratings for Final Early-Stage Innovative Adaptation-Items

Early-stage innovative adaptation item	Likert response scale-points							Combined agreement %
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	
Adoption of alternative retail to increase access to SNAP users	0 (0.0%)	0 (0.0%)	1 (6.7%)	1 (6.7%)	4 (26.7%)	4 (26.7%)	5 (53.3%)	60.0%
Deliberate redesign of physical spaces at FDOs	0 (0.0%)	0 (0.0%)	2 (13.3%)	0 (0.0%)	3 (20.0%)	4 (26.7%)	6 (40.0%)	67.0% ^a
Innovative outreach and communication strategies	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (20.0%)	7 (46.7%)	4 (26.7%)	1 (6.7%)	33.4%
Pivot towards SNAP online and/or online ordering	0 (0.0%)	1 (6.7%)	1 (6.7%)	2 (13.3%)	5 (33.3%)	2 (13.3%)	4 (26.7%)	40.0%
Changing incentive match limit amount (i.e., removed or increased caps on redemptions)	1 (6.7%)	0 (0.0%)	0 (0.0%)	4 (26.7%)	2 (13.3%)	4 (26.7%)	4 (26.7%)	53.4%
Targeted expansion of SNAP/EBT eligibility	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (20.0%)	0 (0.0%)	3 (20.0%)	9 (60.0%)	80.0% ^a

^a Item met the final consensus threshold

Table 7. Likelihood Ratings for Final Long-Term Innovative Adaptation-Items

Long-term innovative adaptation item	Likert response scale-points							Combined likelihood %
	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)	
Continued use of community-based promotion and outreach strategies	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (6.7%)	4 (26.7%)	10 (67.0%)	93.4% ^a
Continued use of SNAP online and/or online shopping systems	1 (6.7%)	1 (6.7%)	2 (13.3%)	1 (6.7%)	2 (13.3%)	4 (26.7%)	4 (26.7%)	53.4%

^a Item met the final consensus threshold

promotion and outreach strategies” and “Continued use of SNAP online and/or online shopping systems”) would endure as best practices for SBIP practitioners long-term. Only one of these items, “Continued use of community-based promotion and outreach strategies,” met the consensus threshold, achieving near unanimous likelihood agreement.

Discussion

Since the emergence of COVID-19 in early 2020, policymakers, researchers, and other food system stakeholders have broadened their attention on the resilience of the food system, and the adaptive capacity of specific policies and programs designed to mitigate the pandemic’s devastating impacts on food insecurity across vulnerable populations (Gundersen et al., 2021).

Despite SBIPs being recognized as a critical intervention model to alleviate food hardship and food insecurity, a significant lack of understanding of COVID-19’s consequences on these programs prevented practitioners from fully anticipating the pandemic-related challenges and opportunities that arose (John et al., 2021; Parks, Han et al., 2021). We therefore determined that our decision to solicit the expertise of SBIP practitioners through a structured and systematic group consensus process (the Delphi technique) was appropriate and necessary to better understand the evolving state of nutrition incentive programming following COVID-19’s arrival in the U.S. Our findings demonstrate that consensus was reached across the three core constructs evaluated in this study: barriers, opportunities, and innovative adaptations. To better reflect the highly variable and rapidly shifting operating conditions for SBIP operators, we prompted the panelists to additionally consider these dynamics across two timeframes: in the early stages of the pandemic (the first several months of 2020) and long-term (over the next several years).

Within the barrier construct, the panelists reached consensus on only one early-stage barrier item: “Lack of access to SNAP online and/or online ordering systems.” This finding indicates that the panelists considered the adoption of online systems to be cumbersome and/or exclusionary for both FDO operators and SNAP shoppers alike and

corroborates existing literature that suggests that the unintentional exclusion of market shoppers who had limited technology access or were not “tech savvy” was indeed a critical barrier to SBIP operations in the early stages of the pandemic (Broadaway & Wolnik, 2020; Nutrition Incentive Hub, 2020a, 2020b).

Panelists agreed that “Staff burnout and/or turnover” was a critical long-term barrier, a finding supported by prior research demonstrating that operational shifts at FDOs in response to COVID-19 placed “immense stress and new responsibilities on market operators, market staff, and volunteers” (Broadaway & Spencer, 2021, p. 1) and predictions that the pandemic’s lingering effects could remain a strain on operators for the foreseeable future (O’Hara et al., 2021).

We found that consensus was achieved for all five early-stage opportunity items considered in the final round. “Increased consumer appreciation for small businesses” was a reference to practitioners’ recognition that market shoppers in early 2020 were broadly supportive of small, locally owned businesses hurt by lockdown measures. This item paralleled panelist support for another, very similar item: “Renewed consumer interest in FDOs and/or local food.” With near-unanimous agreement, the panelists identified a significantly boosted interest in farmers markets and locally grown produce in the first several months of the pandemic, a likely consequence of disruptions to conventional food supply chains and prolonged stay-at-home orders (Hobbs, 2020; Kolodinsky et al., 2020). Although heightened local food interest and consumption from consumers in the early pandemic period were widely recognized, practitioners and researchers alike have expressed doubts that this interest would persist long-term (Broadaway & Spencer, 2021; Klisch & Soule, 2020; Nutrition Incentive Hub, 2021a; Parker et al., 2021).

Another early-stage opportunity that reached final consensus, “Increased collaboration and networking between stakeholders,” reflects recent literature suggesting that the building of community partnerships (“social bridging”) was a unique opportunity for SBIP practitioners in the early stages of the pandemic (Nutrition Incentive Hub, 2020a, 2021a, 2021b; Worstell, 2020). Finally, the panelists

agreed that “Increased consumer interest in using SNAP and/or nutrition incentives...” was a highly salient opportunity in the early stages of the pandemic—a result supported by an empirically documented increase in consumer demand for food assistance programming, with nutrition incentive use accounting for dramatic spikes in SNAP use in 2020 compared with 2019 data (Nutrition Incentive Hub, 2021a; M. Parker et al., 2021).

Only one long-term opportunity reached panel consensus: “Sustained collaboration and networking between stakeholders.” This finding, which also emerged as an evidence review theme, suggests that the social bridging that was recognized in the early stages of the pandemic was also identified as a dynamic that could remain positively influential to SBIP operations, altering existent practitioners’ collaboration and partnership-building models for years to come (Nutrition Incentive Hub, 2021b).

The panelists reached consensus on two early-stage innovative adaptation items: “Deliberate redesign of physical spaces at FDOs” and “Targeted expansion of SNAP/EBT eligibility.” The former item was positioned as a prominent health and safety practice in the early stages of the pandemic, with the implementation of limited entry designs, directional tape to manage customer flow, and other capacity control measures at farmers markets and other FDOs considered salient early-stage adaptations to COVID-19 (Broadaway & Spencer, 2021; Broadway & Wolnik, 2020; Klisch & Soule, 2020). The panelists’ consensus on the “Targeted expansion of SNAP/EBT eligibility” is supported by literature emphasizing the number of FDO operators who were successful in modifying both the distribution timing and amount of nutrition incentives to improve FF&V access and mitigate food insecurity during the early 2020 period (Nutrition Incentive Hub, 2021c; M. Parker et al., 2021; Thilmany et al., 2020).

Finally, the panelists reached near-unanimous consensus on one long-term innovative adaptation item: “Continued use of community-based promotion and outreach strategies.” With recent practitioner literature explicitly acknowledging the long-term value of adopting innovative community-based promotion and outreach models (such as “Market Navigator” projects) to help SBIP practi-

tioners better access limited-resource communities, this finding spotlights a potential avenue for practitioners to mitigate a suite of barriers related to increasing consumer access (Klisch & Soule, 2020; Nutrition Incentive Hub, 2021b).

Limitations

Although the Delphi technique has been applied frequently to generate solutions and other targeted, contextually grounded outcomes for complex topics across contexts, long-standing critiques about the validity and rigor of the method (attributable primarily to its plasticity and lack of standardization) should be considered when evaluating findings (Hasson & Keeney, 2011). While we applied techniques to improve the overall trustworthiness of results (such as peer debriefing), qualitative standards for rigor may not be compatible with the standards of rigor typically applied in quantitative or experimental studies and should therefore be assessed accordingly (Mays & Pope, 2000).

Another potential limitation involves the scale design modification between rounds two and three. Though we made the decision to shift the response format across all constructs from five-point to seven-point Likert scales to more precisely capture the panelists’ actual opinions on each item under consideration, evidence suggests that using different rating scales of equivalent reliability with the same audience produces different consensus results (Lange et al., 2020). Round three’s changed rating format is therefore likely to have restricted the number of items that qualified for final consensus. It is also expected, however, that the panelists’ views were more accurately reflected in the third round (Drumm et al., 2022).

Conclusion and Recommendations

In this study, we applied the Delphi technique with a panel of SBIP practitioner experts to examine salient factors influencing the operating conditions of nutrition incentive program practitioners in the pandemic era. We used a three-round Delphi approach with an expert panel ($N=15$) of nutrition incentive practitioners between May and October of 2021, analyzing data from three online surveys through both thematic analysis and descriptive statistics. Panelists identified and reached consensus

on several barriers, opportunities, and innovative adaptations in incentive programming operations, both in the early stages of the pandemic outbreak and those that may persist long-term.

We provide key recommendations for both practitioners and researchers below. These recommendations are not meant to be exhaustive, but rather provide a starting point for future engagement with the topic of SBIP resilience to COVID-19, future pandemic events, or other system shocks.

Recommendations for Practitioners

Given that operating conditions and dynamics have changed drastically since COVID-19's emergence in early 2020, the early-stage barrier, opportunity, and innovative adaptation findings likely have diminished relevance for SBIP practitioners operating today. Practitioners may be very interested, however, in further examining all long-term variables that were under consideration by expert panelists in round three and were identified as salient themes in the rapid review of emergent SBIP literature. Communicating and collaborating with practitioners may help to identify the most appropriate format for disseminating these results. Key long-term findings could be incorporated into an accessible and adaptable checklist tool for practitioners operating at various levels of SBIP practice (such as statewide coordinators vs. FDO operators). Relevant coalition bodies, such as the Nutrition Incentive Hub, the Farmers Market Coalition, and the Local and Regional Food System Recovery and Resilience Project 2.0, may also consider representing the following topics at their annual convenings or scheduled monthly webinar events:

- “Staff burnout and/or turnover” was a long-term barrier that achieved consensus in the final Delphi round. The belief that staff burnout would likely persist over the next several years should warrant structured discussion on how FDO operators can be better supported at markets and other retail outlets where nutrition incentives are provisioned. Whether it is because FDOs are critically understaffed, or personnel are undertrained to manage core responsibilities while also maintaining COVID-

related health and safety protocols, targeted knowledge-sharing exchanges could help to mitigate this phenomenon.

- “Sustained collaboration and networking between stakeholders” was a long-term opportunity perceived to be likely to endure as a positively influential dynamic in SBIP practice over the next several years. Relevant organizations and coalition bodies could continue to host and expand facilitated, cross-sectoral discussions designed to share best practices related to networking and encourage even greater inter-organizational collaboration. The Nutrition Incentive Hub is the most prominent example of this currently in practice targeting technical support and guidance for nutrition incentive practitioners. For broader food system networking aimed at fostering cross-agency and cross-sector learning, collaboration, and strategic action planning in the post-COVID era, the Local and Regional Food System Recovery and Resilience Project 2.0 serves as a valuable coalition model.
- “Continued use of community-based promotion and outreach strategies” was a final long-term innovative adaptation consensus item. With support for the potential long-term value of adopting innovative community-based promotion and outreach models, the Nutrition Incentive Hub or the Farmers Market Coalition could drastically expand promotion of existing outreach models, such as the “Market Navigator” projects, to help SBIP practitioners (particularly FDO operators) better access the limited-resource communities most in need of nutrition incentive programming.

Recommendations for Future Research

We believe that additional research using the Delphi technique or related group consensus methods (such as the Nominal Group Technique) with this population should be pursued (Harvey & Holmes, 2012). Considering the extremely variable operating conditions for SBIP practitioners due to the evolution of the coronavirus and the rapid shifts in pandemic adaptation policies (such as mask mandates) within the study period, the findings generated in this study may not be wholly rep-

representative of the most salient dynamics practitioners face today. As such, identifying the most current and relevant factors affecting nutrition incentive programming through a structured consensus technique should be regularly performed to monitor—in a contextually grounded way—the operational capacities of SBIPs and SBIP practitioners over the next several years.

Additionally, there are opportunities to evaluate whether there are distinctions in the needs of specific practitioner groups (and/or the types of organizations they represent) to improve their adaptive capacities for future pandemic or disaster events. In our study, the inclusion criterion we developed stipulated that any individual who had direct experience with the implementation, administration, or evaluation of SBIPs was eligible to participate. This criterion facilitated a high degree

of variability in the specific types and scales of SBIP operations participants represented. Directors of statewide farmers market associations, administrative personnel at nationally focused SBIP organizations, and nutrition incentive program managers in regional nonprofit organizations were all included in the final expert panel. Beyond two screening questions in the round-one survey, this study did not advance a mechanism to operationalize or appraise the variability between participants representing distinct SBIP operation types and scales. Future researchers, whether they are applying a similar group consensus-building technique or some other research method with this population, should consider developing a more robust participant segmentation protocol to capture the diversity of practitioner roles and more explicitly operationalize them for future studies. 

References

- Ahn, S., & Norwood, F. B. (2021). Measuring food insecurity during the COVID-19 pandemic of spring 2020. *Applied Economic Perspectives and Policy*, 43(1), 162–168. <https://doi.org/10.1002/aep.13069>
- Balasuriya, L., Berkowitz, S. A., & Seligman, H. K. (2021). Federal nutrition programs after the pandemic: Learning from P-EBT and SNAP to create the next generation of food safety net programs. *Inquiry: The Journal of Health Care Organization, Provision, and Financing*, 58. <https://doi.org/10.1177/00469580211005190>
- Barasa, E., Mbau, R., & Gilson, L. (2018). What is resilience and how can it be nurtured? A systematic review of empirical literature on organizational resilience. *International Journal of Health Policy and Management*, 7(6), 491–503. <https://doi.org/10.15171/ijhpm.2018.06>
- Bender, K. E., Badiger, A., Roe, B. E., Shu, Y., & Qi, D. (2022). Consumer behavior during the COVID-19 pandemic: An analysis of food purchasing and management behaviors in U.S. households through the lens of food system resilience. *Socio-Economic Planning Sciences*, 82(A), Article 101107. <https://doi.org/10.1016/j.seps.2021.101107>
- Bernard, H. R., Wutich, A., & Ryan, G. W. (2016). *Analyzing qualitative data: Systematic approaches* (2nd ed.). SAGE.
- Brady, S. R. (2015). Utilizing and adapting the Delphi method for use in qualitative research. *International Journal of Qualitative Methods*, 14(5). <https://doi.org/10.1177/1609406915621381>
- Broadaway, D., & Spencer, E. (2021). *Alternative farmers market models*. University of Kentucky AEC Extension Publication LSF-IB-14. <https://lfscovid.localfoodeconomics.com/resources/3519-2/>
- Broadaway, D., & Wolnik, D. (2020). Iteration, innovation, and collaboration: Supporting farmers markets' response to COVID-19. *Journal of Agriculture, Food Systems, and Community Development*, 10(1), 233–236. <https://doi.org/10.5304/jafscd.2020.101.014>
- Campbell, C. (2021). The impact of COVID-19 on local government stakeholders' perspectives on local food production. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 71–88. <https://doi.org/10.5304/jafscd.2021.102.035>
- Connelly, L. M. (2016). Trustworthiness in qualitative research. *Medsurg Nursing*, 25(6), 435–436. <https://www.proquest.com/openview/44ffecf38cc6b67451f32f6f96a40c78/1?pq-origsite=gscholar&cbl=30764>
- Double Up Arizona. (2020, June 5). *Double your P-EBT benefits*. <https://www.doubleupaz.org/blog/2020/6/5/double-your-p-ebt-benefits>

- Drumm, S., Bradley, C., & Moriarty, F. (2022). 'More of an art than a science'? The development, design and mechanics of the Delphi Technique. *Research in Social and Administrative Pharmacy*, 18(1), 2230–2236. <https://doi.org/10.1016/j.sapharm.2021.06.027>
- Engel, K., & Ruder, E. H. (2020). Fruit and vegetable incentive programs for Supplemental Nutrition Assistance Program (SNAP) participants: A scoping review of program structure. *Nutrients*, 12(6), Article 1676. <https://doi.org/10.3390/nu12061676>
- Feeding Florida. (n.d.). *How to double your SNAP/EBT for Florida-grown produce with Fresh Access Bucks*. Retrieved June 2022 from <https://www.feedingflorida.org/food-access/fresh-access-bucks/how-fab-works>
- Fitzpatrick, K. M., Harris, C., Drawve, G., & Willis, D. E. (2021). Assessing food insecurity among US adults during the COVID-19 pandemic. *Journal of Hunger & Environmental Nutrition*, 16(1), 1–18. <https://doi.org/10.1080/19320248.2020.1830221>
- Garner, J. A., Coombs, C., Savoie Roskos, M. R., Durward, C., & Seguin-Fowler, R. A. (2020). A qualitative evaluation of Double Up Food Bucks farmers' market incentive program access. *Journal of Nutrition Education and Behavior*, 52(7), 705–712. <https://doi.org/10.1016/j.jneb.2019.11.010>
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.
- Gundersen, C., Hake, M., Dewey, A., & Engelhard, E. (2021). Food insecurity during COVID-19. *Applied Economic Perspectives and Policy*, 43(1), 153–161. <https://doi.org/10.1002/aep.13100>
- Gundersen, C., & Ziliak, J. P. (2018). Food insecurity research in the United States: Where we have been and where we need to go. *Applied Economic Perspectives and Policy*, 40(1), 119–135. <https://doi.org/10.1093/aep/ppx058>
- Gusto, C., Diaz, J. M., Warner, L. A., & Monaghan, P. (2020). Advancing ideas for farmers market incentives: Barriers, strategies, and agency perceptions from market managers. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 245–260. <https://doi.org/10.5304/jafscd.2020.093.022>
- Harvey, N., & Holmes, C. A. (2012). Nominal group technique: An effective method for obtaining group consensus. *International Journal of Nursing Practice*, 18(2), 188–194. <https://doi.org/10.1111/j.1440-172X.2012.02017.x>
- Hasson, F., & Keeney, S. (2011). Enhancing rigour in the Delphi technique research. *Technological Forecasting and Social Change*, 78(9), 1695–1704. <https://doi.org/10.1016/j.techfore.2011.04.005>
- Hobbs, J. E. (2020). Food supply chains during the COVID-19 pandemic. *Canadian Journal of Agricultural Economics/Revue canadienne D'Agroéconomie*, 68(2), 171–176. <https://doi.org/10.1111/cjag.12237>
- John, S., Lyerly, R., Wilde, P., Cohen, E. D., Lawson, E., & Nunn, A. (2021). The case for a national SNAP fruit and vegetable incentive program. *American Journal of Public Health*, 111(1), 27–29. <https://doi.org/10.2105/AJPH.2020.305987>
- Klisch, S., & Soule, K. E. (2020). Farmers markets: Working with community partners to provide essential services during COVID-19. *Journal of Agriculture, Food Systems, and Community Development*, 9(4), 175–179. <https://doi.org/10.5304/jafscd.2020.094.035>
- Kolodinsky, J., Sitaker, M., Chase, L., Smith, D., & Wang, W. (2020). Food systems disruptions: Turning a threat into an opportunity for local food systems. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 5–8. <https://doi.org/10.5304/jafscd.2020.093.013>
- Kyngäs, H., Kääriäinen, M., & Elo, S. (2019). The trustworthiness of content analysis. In H. Kyngäs, K. Mikkonen, & M. Kääriäinen (Eds.), *The application of content analysis in nursing science research* (pp. 41–48). Springer, Cham.
- Lange, T., Kopkow, C., Lützner, J., Günther, K.-P., Gravius, S., Scharf, H.-P., Stöve, J., Wagner, R., & Schmitt, J. (2020). Comparison of different rating scales for the use in Delphi studies: Different scales lead to different consensus and show different test-retest reliability. *BMC Medical Research Methodology*, 20, Article 28. <https://doi.org/10.1186/s12874-020-0912-8>
- Lewis, E. C., Colón-Ramos, U., Gittelsohn, J., & Clay, L. (2021). Food-seeking behaviors and food insecurity risk during the coronavirus disease 2019 pandemic. *Journal of Nutrition Education and Behavior*, 54(2), 159–171. <https://doi.org/10.1016/j.jneb.2021.05.002>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.

- Linstone, H. A., & Turoff, M. (2002). Introduction. In H. A. Linstone, M. Turoff, & O. Helmer (Eds.), *The Delphi method: Techniques and applications* (pp. 3–12). Addison-Wesley.
- Mays, N., & Pope, C. (2000). Assessing quality in qualitative research. *BMJ*, 320(7226), 50–52.
<https://doi.org/10.1136/bmj.320.7226.50>
- Naderifar, M., Goli, H., & Ghaljaie, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education*, 14(3). Article e67670. <https://doi.org/10.5812/sdme.67670>
- Niederberger, M., & Spranger, J. (2020). Delphi technique in health sciences: A map. *Frontiers in Public Health*, 8, Article 457. <https://doi.org/10.3389/fpubh.2020.00457>
- Niles, M. T., Bertmann, F., Belarmino, E. H., Wentworth, T., Biehl, E., & Neff, R. (2020). The early food insecurity impacts of COVID-19. *Nutrients*, 12(7), Article 2096. <https://doi.org/10.3390/nu12072096>
- Nutrition Incentive Hub. (2020a, July 1). *Grantee spotlight: Forsyth Farmers Market*.
<https://www.nutritionincentivehub.org/news-events/news/forsyth-farmers-market>
- Nutrition Incentive Hub. (2020b, June 3). *Grantee spotlight: Double Up Food Bucks Mississippi*.
<https://www.nutritionincentivehub.org/news-events/news/double-up-food-bucks-mississippi>
- Nutrition Incentive Hub. (2021a). *Incorporating Community Supported Agriculture (CSA) & box programs* [Video].
<https://youtu.be/dlQ2DXUKg-Q>
- Nutrition Incentive Hub. (2021b). *Pivots, innovations, and adaptations to COVID-19* [Video]. <https://youtu.be/ITpZXgrPYrc>
- Nutrition Incentive Hub. (2021c). *Gus Schumacher Nutrition Incentive Program Training, Technical Assistance, Evaluation, and Information Center (GusNIP NTAE): Summary of Impact Findings: Year 1: September 1, 2019 to August 31, 2020*.
https://www.nutritionincentivehub.org/media/swvfnm4/gusnip-ntae-summary-of-impact-findings_year-1.pdf
- O'Hara, J., Wolnik, D., & Broadaway, D. (2021). *Using budgets to help farmers markets adapt to COVID-19's disruptive impacts* (Local Food Systems Response to COVID: Building Better Beyond, Case Study 01). Retrieved from the Local and Regional Food Systems Response to Covid: Recovery and Resilience website:
<https://lfsccovid.localfoodeconomics.com/resources/using-budgets-to-help-farmers-markets-adapt-to-covid-19s-disruptive-impacts/>
- Parker, C., Scott, S., & Geddes, A. (2019). Snowball sampling. *SAGE Publications*.
<https://doi.org/10.4135/9781526421036831710>
- Parker, M. K., Hedrick, V. E., Hedges, S., Borst, E., Ledlie Johnson, M., Best, M., & Misyak, S. A. (2021). SNAP participants' purchasing patterns at a food co-op during the COVID-19 pandemic. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 147–156. <https://doi.org/10.5304/jafscd.2021.102.043>
- Parks, C. A., Han, P., Fricke, H. E., Parker, H. A., Hesterman, O. B., & Yaroch, A. L. (2021). Reducing food insecurity and improving fruit and vegetable intake through a nutrition incentive program in Michigan, USA. *SSM-Population Health*, 15, Article 100898. <https://doi.org/10.1016/j.ssmph.2021.100898>
- Parks, C. A., Mitchell, E., Byker Shanks, C., Nugent, N. B., Fricke, H. E., & Yaroch, A. L. (2021). Descriptive characteristics of nutrition incentive projects across the U.S.: A comparison between farm direct and brick and mortar settings. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 58, Article 00469580211064131. <https://doi.org/10.1177/00469580211064131>
- Parks, C. A., Stern, K. L., Fricke, H. E., Clausen, W., Fox, T. A., & Yaroch, A. L. (2019). Food insecurity nutrition incentive grant program: Implications for the 2018 farm bill and future directions. *Journal of the Academy of Nutrition and Dietetics*, 119(3), 395–399. <https://doi.org/10.1016/j.jand.2018.12.005>
- Parks, C. A., Stern, K. L., Fricke, H. E., Clausen, W., & Yaroch, A. L. (2020). Healthy food incentive programs: Findings from food insecurity nutrition incentive programs across the United States. *Health Promotion Practice*, 21(3), 421–429. <https://doi.org/10.1177/1524839919898207>
- Savoie Roskos, M. R., Wengreen, H., Gast, J., LeBlanc, H., & Durward, C. (2017). Understanding the experiences of low-income individuals receiving farmers' market incentives in the United States: A qualitative study. *Health Promotion Practice*, 18(6), 869–878. <https://doi.org/10.1177/1524839917715438>

- Schanzenbach, D., & Pitts, A. (2020, May 13). *Estimates of food insecurity during the COVID-19 crisis: Results from the COVID impact survey, week 1 (April 20–26, 2020)* (IPR Rapid Research Report). Institute for Policy Research, Northwestern University.
https://www.ipr.northwestern.edu/documents/reports/food-insecurity-covid_week1_report-13-may-2020.pdf
- Siddiqi, S. M., Cantor, J., Dastidar, M. G., Beckman, R., Richardson, A. S., Baird, M. D., & Dubowitz, T. (2021). SNAP participants and high levels of food insecurity in the early stages of the COVID-19 pandemic. *Public Health Reports*, 136(4), 457–465. <https://doi.org/10.1177/00333549211007152>
- Sustainable Food Center. (n.d.). *Double Up Food Bucks*. Retrieved June 2022 from <https://sustainablefoodcenter.org/double-up-food-bucks>
- Thilmany, D., Jablonski, B., Angelo, B., Low, S., & Tropp, D. (2020). *Mitigating immediate harmful impacts of COVID-19 on Colorado farms and ranches selling through local and regional food markets*. National Sustainable Agriculture Coalition.
https://mountainscholar.org/bitstream/handle/10217/217134/REDI_UCSU6_69.2_M69_2020.pdf
- U.S. Department of Agriculture [USDA]. (2021, April 13). *USDA invests more than \$330 million in specialty crops grants, incentives to purchase fruits and vegetables, and help for cotton producers* [Press Release No. 0071.21].
<https://www.usda.gov/media/press-releases/2021/04/13/usda-invests-more-330-million-specialty-crops-grants-incentives>
- USDA Food and Nutrition Service [USDA FNS]. (n.d.-a). *SNAP COVID-19 waivers*. Retrieved July 2022 from <https://www.fns.usda.gov/programs/fns-disaster-assistance/fns-responds-covid-19/snap-covid-19-waivers>
- USDA FNS. (n.d.-b). *State guidance on Coronavirus P-EBT*. Retrieved July 2022 from <https://www.fns.usda.gov/snap/state-guidance-coronavirus-pandemic-ebt-pebt>
- USDA National Institute of Food and Agriculture [USDA NIFA]. (n.d.). *Gus Schumacher Nutrition Incentive Program (GusNIP)*. Retrieved July 2022 from <https://nifa.usda.gov/program/gus-schumacher-nutrition-incentive-grant-program>
- Weersink, A., von Massow, M., Bannon, N., Ifft, J., Maples, J., McEwan, K., McKendree, M. G. S., Nicholson, C., Novakovic, A., Rangarajan, A., Richards, T., Rickard, B., Rude, J., Schipanski, M., Schnitkey, G., Schulz, L., Schuurman, D., Schwartzkopf-Genswein, K., Stephenson, M., ... Wood, K. (2021). COVID-19 and the agri-food system in the United States and Canada. *Agricultural Systems*, 188, Article 103039.
<https://doi.org/10.1016/j.agsy.2020.103039>
- Worstell, J. (2020). Ecological resilience of food systems in response to the COVID-19 crisis. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 23–30. <https://doi.org/10.5304/jafscd.2020.093.015>
- Ziliak, J. P. (2021). Food hardship during the COVID-19 pandemic and Great Recession. *Applied Economic Perspectives and Policy*, 43(1), 132–152. <https://doi.org/10.1002/aep.13099>

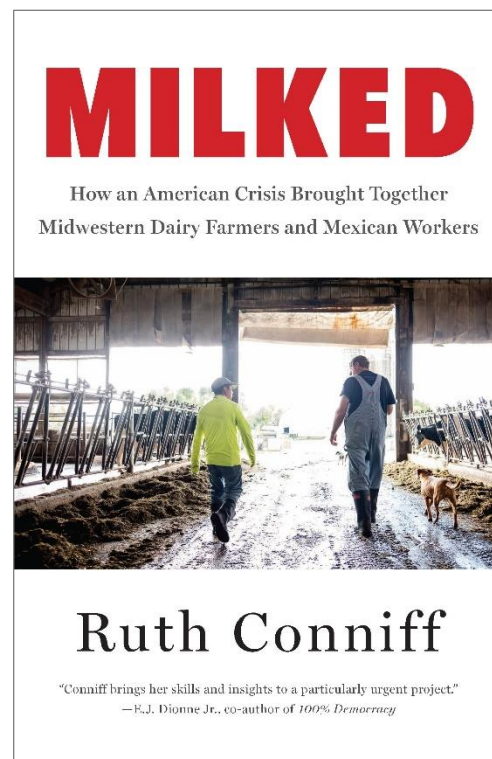
Lessons in shared humanity from Wisconsin's dairy farmers and Mexican workers

Book review by

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Review of *Milked: How an American Crisis Brought Together Midwestern Dairy Farmers and Mexican Workers*, by Ruth Conniff. (2022). Published by The New Press. Available as hardcover and e-book; 304 pages. Publisher's website: <https://thenewpress.com/books/milked>



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“Numbers numb, but stories stir,” as the saying goes. As a journalist and the editor-in-chief of the *Wisconsin Examiner*, Ruth Conniff is well aware of the power of human-interest narratives to grab readers’ attention and illustrate social trends. Her first book, *Milked: How an American Crisis Brought Together Midwestern Dairy Farmers and Mexican Workers*, attempts to harness this power by explor-

ing the personal motivations of dairy farmers in Wisconsin, Mexican workers on their farms, and the Mexican-American families of the workers.

The book is a biographical project spanning both sides of the U.S.-Mexico border, with Conniff spending one year in Oaxaca, Mexico, beginning in 2017. In addition to farmers and their workers, she interviews interpreters who have served as intermediaries between the two groups, including on trips that dairy farmers have taken to Mexico to visit workers’ families. She also interviews a few well-known advocates and politicians, whose perspectives are presented in the book’s final chapters.

Although Conniff explores cultural differences and does not shy away from discussing power im-

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balances, her emphasis is really on the parallels between rural Mexico and rural Wisconsin, the common values shared by the farmers and workers, and the increasing interdependence of the two groups. The biographies are set against a backdrop of rural population drain and farm loss, in both Wisconsin and Mexico. Through the life stories of the interviewees with a bit of political history woven in, readers come to understand why the survival of Wisconsin's remaining dairy farms is now wholly reliant on the labor of undocumented Mexican workers, just as their rural communities of origin in Mexico are dependent on the wages they send home. Many of the workers Conniff interviews are in various stages of building homes and small businesses in Mexico, hoping to return to their extended families rather than remain in the United States. She likens their dreams—and the work ethic necessary to achieve them—to those of the dairy farmers who decided to remain in agriculture and grow their farms in order to compete in an age of ever-increasing consolidation.

Conniff knows that her readers may see a certain irony in the personal politics of some of the dairy farmers, given their close-up view of immigration issues, yet she hopes that the stories will serve “as an antidote to our divisive politics” (Conniff 2022b, para. 25). Her interview subjects, even those who voted for Trump in 2016 and/or 2020, are unanimous in their view of undocumented workers as essential to the agricultural economy. Nearly all support a visa program for year-round agricultural labor or other reforms to make crossing the border less dangerous. It is an appealing message of a path toward political unity, if not true solidarity, between farmers and workers, but it is difficult to reconcile with the realities of the political geography of Wisconsin, which has the most gerrymandered state legislature in the nation (Brown, 2023) and seems to become more deeply divided with every national election (Balz, 2021).

If readers are able to connect the stories in *Milked* to both historical and contemporary accounts of farmworker struggles in the United States, they could expect to broaden their under-

standing of the economic challenges faced by farmers and farmworkers alike. However, scholars who want to understand Wisconsin's dairy industry from a workplace safety or public health perspective, as well as those who want a full accounting of the environmental impacts of the industry, will need to complement this book with further research. Although the profiles touch on public health issues ranging from workplace injury to addiction and poor mental health, Conniff does not research the prevalence of these conditions among farmers and workers in Wisconsin's dairy sector as a whole. And in contrast to books such as *Tomatoland* (Barry Estabrook, 2011, discussing the tomato industry in Florida) and *The Devil's Fruit* (Dvera I. Saxton, 2021, discussing the strawberry industry in California), *Milked* does not examine the environmental health impacts of the sector nor the occupational hazards that farmers and workers are exposed to on a daily basis.

Still, Conniff achieves her primary purpose, which was to give voice to two groups of people who may be commonly misunderstood and to expose the fallacies of the rhetoric “that pits rural Americans and undocumented immigrants against each other, completely [missing] the point that the two groups have a great deal in common” (Conniff, 2022a, p. 7). While this point—that the groups have a great deal in common—is likely true in other agricultural sectors and areas of the country besides the Midwest, the close relationship between farmers and workers may be unique due to the specific characteristics of dairy production (e.g., workers living on-site year-round, depending on the farmers for rides).

Advocacy groups seeking immigration reform or protections for small and medium farms may find the book useful, particularly as they seek to broaden their coalitions. Despite the difficult path ahead for immigration reform at both the state and national levels, *Milked* reveals how we can follow the lead of farmers and workers who are changing the discourse and building community across cultural and economic divisions, to ultimately win transformative improvements for farmers and farmworkers alike.



References

- Balz, D. (2021, October 8). Wisconsin: The incubator for America's tribal politics. *Washington Post*.
<https://www.washingtonpost.com/politics/2021/10/08/wisconsin-polarization-democrats-republicans/>
- Brown, D. (2023, February 13). *Redistricting redux? How the 2023 Wisconsin Supreme Court election is reviving questions about the state's gerrymandered maps*. University of Wisconsin Law School State Democracy Research Initiative.
<https://statedemocracy.law.wisc.edu/featured/2023/redistricting-redux/>
- Conniff, R. (2022a). *Milked: How an American crisis brought together Midwestern dairy farmers and Mexican workers*. The New Press.
- Conniff, R. (2022b, October 24). Getting past toxic partisanship: Dairy farmers and undocumented workers [Commentary]. *Wisconsin Examiner*. <https://wisconsinexaminer.com/2022/10/24/getting-past-toxic-partisanship-dairy-farmers-and-undocumented-workers/>
- Estabrook, B. (2011). *Tomatoland: How modern industrial agriculture destroyed our most alluring fruit*. Andrews McMeel Publishing.
- Saxton, D. I. (2021). *The devil's fruit: Farmworkers, health, and environmental justice*. Rutgers University Press.

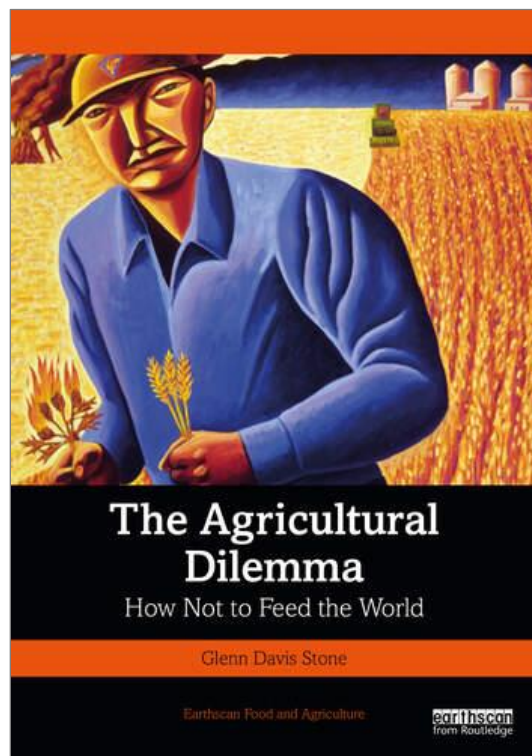
The myth of “feeding the world”: Subsidizing agricultural overproduction and industrial technologies, and marginalizing alternatives

Book review by

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Review of *The Agricultural Dilemma: How Not to Feed the World*, by Glenn Davis Stone. (2022). Published by Earthscan, an imprint of the Taylor & Francis Group. Available as hardcover, paperback, and e-book; 246 pages. Publisher’s website:
<https://www.routledge.com/The-Agricultural-Dilemma-How-Not-to-Feed-the-World/Stone/p/book/9781032260457>



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How many times have you heard some version of the phrase “we need to produce more food to feed a growing population”—often attached to impressively precise estimates of the percentage increases and specific dates far into the future?

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If you’re reading this journal, it’s probably in the thousands, if not more. In this book, Glenn Davis Stone dismantles such claims and shows who is really benefiting from their constant repetition (hint: it’s not most of us). He suggests a description of a problem that should be widely repeated instead: overproduction due to massive government subsidies—particularly for input industries—is leading to the runaway industrialization of agriculture and its numerous negative impacts.

Stone is an anthropologist with more than four decades of experience studying past and present food systems. He has conducted ethnographic and archeological research in locations that include

Nigeria, southern India, the Philippines, and the U.S. He explains that his motivations for writing this book include the marginalization of small-holder farmers by powerful interests, and the limited efforts to date to communicate research on the political ecological advantages of this scale of agriculture to wider audiences.

He examines the history of Malthusian thought with fascinating details of the lives of Thomas Robert Malthus and his followers, who incorrectly blamed the poor for their hunger and frequently concluded that interventions in food and population dynamics were unnecessary. This perspective had catastrophic implications for millions of people in Ireland and India in the late 1800s, who were subjected to starvation based on this philosophy even as tons of export crops from these regions continued to flow to England.

Stone agrees with Malthus that we should focus on the drivers of increasing agricultural production, but says that, “In a sense, Malthus had the causal arrow backward; agriculture did not determine population, but population determined agriculture” (p. 12). Farming that makes intensive use of labor and local technologies (and is less reliant on external inputs) tends to be highly innovative and flexible, and capable of achieving much higher productivity when necessary.

Industrial Neo-Malthusian thought is analyzed in even more detail by the author because it has had an enormous influence on society in recent decades. Embodied most perfectly by “Green Revolution hero” Norman Borlaug, Neo-Malthusians are more willing to intervene in food and population dynamics and to promote the dogma of industrial technologies as a means of increasing food production (p. 45). In practice, this has meant seeking public funding for input industries, which has enabled the appropriation of on-farm processes by large industries and decreased farmers’ self-reliance. This, in turn, has resulted in overproduction and additional costs to society and ecosystems. These costs can be divided into those that are direct, such as for storing massive grain and dairy surpluses, and indirect, such as the embodied

impacts of producing excessive amounts of corn, and then disposing of it by burning it as ethanol.

Fertilizer and seed industries are described as the core drivers of industrial agriculture, as well as having the biggest “halo,” which helps protect them from valid criticisms. Stone details the increasing flows of farmer payments to heavily subsidized fertilizer, seed, pesticide, irrigation, and machinery firms, as well as the credit required to make these purchases.

The Green Revolution receives particular emphasis. Stone suggests that this legend conceals the truth that it “didn’t feed anybody who would have otherwise starved. It was not even intended to produce more *food* than would have been produced otherwise, just more fertilized, irrigated, and pesticide-sprayed wheat as opposed to low-input rice, sorghum, and healthy legumes” (p. 9). Support for his perspective comes from India, which is currently the world’s leading exporter of rice and beef, and where in 2000, a parliamentary committee proposed dumping rotting grain surpluses into the ocean to make room for new harvests. My favorite part of the book is when he demolishes Aaron Sorkin’s character President Jed Bartlet in the insipid television drama *The West Wing*, who parrots the legend of the Green Revolution, as “the classic tale of how we find a way to attribute productivity to a piece of technology in the farmer’s field rather than to the external resources and policies that actually cause change” (p. 163).

Stone’s writing is clear, concise, and engaging. He synthesizes an impressive range of critical scholarship, interspersed with his own fascinating research findings. The index is much less comprehensive than I would prefer, but the accessibility of electronic versions that are searchable by keyword makes this almost a moot point.

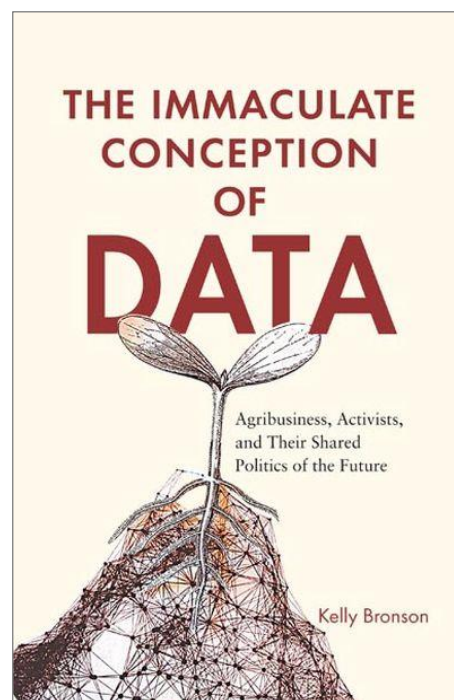
This book would make an excellent supplementary text in a graduate or upper-level undergraduate food systems course. In addition, it should be read by every scholar and activist working on challenging the false premise that increasing yields are the *sine qua non* of food system change.



“Flawless” data: How Big Tech is penetrating modern agriculture

Book review by
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Review of *The Immaculate Conception of Data: Agribusiness, Activists, and Their Shared Politics of the Future*, by Kelly Bronson. (2022). Published by McGill-Queen’s University Press. Available as hardcover, paperback, and eBook; 224 pages. Publisher’s website:
<https://www.mqup.ca/immaculate-conception-of-data--the-products-9780228011224.php>



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In *The Immaculate Conception of Data*, Kelly Bronson plunges into an increasingly intricate web of precision farming, agribusiness, computerized models, data accumulation, and the current (d)evolution of modern food production. The ongoing attempt to marry traditional crop cultivation with computer science and artificial intelligence (AI) is a perplexing fusion of two very differ-

ent worlds, which Bronson does an excellent job of critically analyzing.

Tracing the power relations among the world’s largest Big Tech corporations, some of which seem to even be on the threshold of forming oligopolies (Howard, 2016), Bronson makes the case that the seemingly insatiable optimism around data and digitalization to a large extent stems from ideologically driven narratives, social imaginaries, and techno-progressivist, if not purely transhumanist, discourses. In nothing short of a rigorous critique, Bronson teases out the roots of the data hype and scrutinizes the rhetoric

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which companies employ to buttress a novel idea of how food should be grown and produced—namely, with cutting-edge robotics, drones, sensor technologies, and data analytics.

Bronson explores crucial questions that require answers, questions such as: Why are companies like Google and Microsoft increasingly becoming involved in the food sector (Chapter 1)? To what extent should the current hyper-digitalization of farming be viewed as an agricultural revolution or merely an extension and acceleration of capitalist business-as-usual (Chapter 2)? Are Big Tech and precision agriculture compatible with alternative, small-scale farming methods such as agroecology (Chapter 3)? Who benefits from data accumulation, and who is left out? And do farmers themselves have access to the data they sell back to the companies (Chapter 5)?

Within a theoretical framework that Bronson refers to as the “immaculate conception of data,” the reader is invited on a journey filled with personal acquaintances with farmers, interviews with stakeholders, and investigative discussions drawn from up-to-date research. The reader gets to climb into colossal tractors on sun-bathed corn fields or attend AI conferences with near-religious atmospheres (p. 60).

A recurrent theme throughout the book is the examination of machine fetishism and the way data is increasingly being perceived as something flawless, perfect, and benign, that is, inscribed with an *immaculate* quality (p. 83). Rather than simply connecting people around the world, the “fluffiness” of the internet cloud and the global harnessing of raw data are teeming with closed systems, behind-the-door exchanges, and huge profits (Zuboff, 2019). While the surge of digitalization and data holds promises for many start-ups and industrial farmers, Bronson seeks to shift the gaze to less traversed topics, such as the consequences of the data-hype in terms of environmental injustice, biodiversity loss, and greenhouse emissions (p. 135). With ever more orbiting satellites, tractors with built-in sensors, and dairy barns tended by robots, Bronson seeks to answer: At what price do we allow fields, soils, and domesticated animals to be adopted by a digital empire, or “a powerful sociotechnical imaginary” (p. 82)?

Yet, what makes the book even more compelling is the invitation to an alternative and more critical view of the bedrocks of late capitalist society: digitalization, data, and AI. While the highly alluring neoproductivist narrative contends that digitalizing the agricultural sector is pivotal for establishing food security and feeding a growing world population (p. 147), the alternative viewpoint highlights rural depopulation, exacerbated inequalities, and a perpetuated tech-dependency for farmers, leading to the so-called “technology treadmill” (p. 50). Through interviews with prominent stakeholders, machine-endorsing large-scale farmers, and decentralized bottom-up activists (p. 64), the author offers a range of kaleidoscopes through which to observe the food industry and the emerging techno-solutionist discourse.

Most of the book is situated within a Western context, however, and it would be enhanced by including more voices from Indigenous communities and smallholder farmers from the Global South. Moreover, the “immaculate conception of data” framework would be strengthened if combined with an analysis of the embodied energy of precision farming machinery and similar technologies, for instance, by drawing the connections between the abstract concept of “data” or “AI” and the inexorable concrete inputs of fossil fuels, rare-earth minerals, and cheap labor which constitute their physical backbone.

Materialism aside, one of the key messages conveyed by the book is that rather than a natural and linear blossoming, the recent burst of digital agriculture was more of a deliberate ignition by powerful actors, in which the flawless and salient construction of a utopian digital paradise has been—and still is—ingrained in much of the academic research, reproduced in social media outlets, and financially funded and discursively reinforced by Big Tech conglomerates (p. 14). Yet, while many peasant communities worldwide vehemently oppose the development of digital agriculture (ETC Group, 2022), others are trying to snatch and remold the data-harnessing technologies and inoculate them with concepts of decentralization and collectivism (p. 22). These political oppositions add to the unabated discussion about

where the limits to technological complexity and development should be set, not least within agriculture (p. 65).

For anyone interested in gaining a critical perspective on the accelerated digitalization of the

planet, as well as a better understanding of why farming is increasingly spoken of with a language and jargon that previously belonged to computer scientists and programmers, *The Immaculate Conception of Data* is an exceptional starting point. 

References

ETC Group. (2022). *Food Barons 2022: Crisis profiteering, digitalization and shifting power*.

https://www.etcgroup.org/sites/www.etcgroup.org/files/files/food-barons-2022-summaries-final_16_sept_.pdf

Howard, P. H. (2016). *Concentration and power in the food system: Who controls what we eat?* Bloomsbury Academic.

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. PublicAffairs.