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Plus: The Enhancing Food Security in
the Northeast Project, Part 1*



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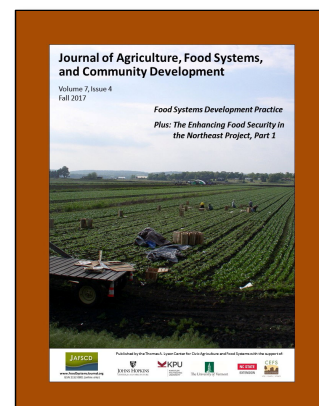
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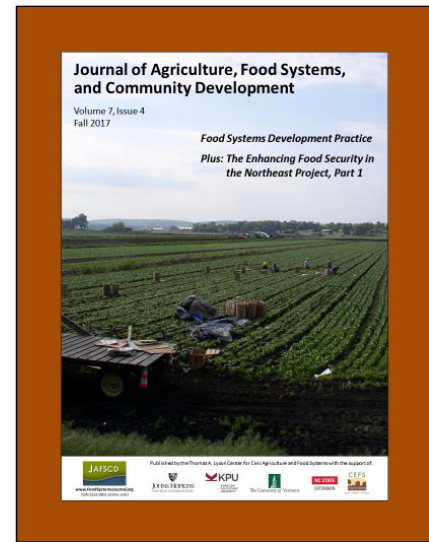
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IN THIS ISSUE DUNCAN HILCHEY

Food systems development practice and the Enhancing Food Security in the Northeast (EFSNE) project, part 1



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In this issue of JAFSCD, we wrap up our 7th volume of JAFSCD with a group of papers that focus on food systems development as a professional practice, plus our first of two installments of the Enhancing Food Security in the Northeast (EFSNE) project. EFSNE has completed what is perhaps the most exhaustive analysis ever conducted of a single regional (multistate) food system in North America.

We start out the issue with our columnists, who take a crack at understanding food systems through four different lenses. In *The Soul of the Local Food Movement*, **John Ikerd** argues that the resilience of the local food systems depends on peoples' willingness to give "purpose priority over profits."

In *Cacao Fields and Dairy Cows: The Interdependencies between Mexican Workers and the U.S. Food System*, **Teresa M. Mares** explores the irony of Vermont's brand as a bastion of good food, while employing untold numbers of immigrant farm workers.

In *Transdisciplinary and Systems Approaches to Food Security*, **Kate Clancy** calls on food systems development researchers and practitioners to pay close attention to the interdisciplinary food systems development work in the Global South and adapt models that may work elsewhere.

And in *Collective Agency and Community Resilience: A Theoretical Framework to Understand Agricultural Resistance*,

On our cover: Farmworkers pick a field of callaloo (also known as Chinese spinach) in the Black Dirt region of Orange County, New York. Traditionally a bulk onion production region, the Black Dirt region has been gradually shifting to an ever greater variety of truck crops for sale particularly to the diverse markets (including ethnic markets) in New York City. Such diversification by more traditional midscale, single-crop farmers will need to happen if the Northeastern U.S. is to significantly increase its overall food self-sufficiency.

(Photo copyright © 2007 by Duncan Hilchey.)

Monica M. White once again delves into the history of African American activist farmers to inform the current interest in black empowerment through the act of self-provisioning.

Next, we offer three commentaries from the field. In *Urban Agricultural and Sustainability Program at Houston's Downtown University: Combining New Curriculum, Hands-on Projects, and a Hurricane*, **Lisa Morano** and **Vassilios Tzouanas**, both at University of Houston–Downtown, share their experience of rebuilding an urban agriculture program after its virtual destruction by Hurricane Harvey.

In *Interdisciplinary Food-Related Academic Programs: A 2015 Snapshot of the United States Landscape*, **Jennifer Hartle**, **Schyler Cole**, **Paula Trepman**, **Benjamin Chrisinger**, and **Christopher Gardner** provide a look at the range of food systems-related degree programs in the U.S. during a time of expansion.

Henry Blair of GrowNYC and **Carolyn Dimitri** of New York University then team up to comment on the need for expanding grain production for human consumption into field crop rotations in the Northeastern U.S. in *Bridging Crop Diversity and Market Development in the Northeast Grain Renaissance*.

A unifying theme of several of our open call papers in this issue is food systems development practice. In *Community Food Work as Critical Practice: A Faith-Based Perspective through Narratives* **Rebecca Ligrani** and **Kim Niewolny** use narrative inquiry and collective reflection to explore the intersection of religion and social justice through a food lens.

Christy Anderson Brekken, **Melissa Parks**, **Matthew Lundgren**, all at Oregon State University, then use consumer and producer data in tandem to more fully appreciate the feasibility of a statewide food initiative in *Oregon Producer and Consumer Engagement in Regional Food Networks: Motivations and Future Opportunities*.

Next, in *Participatory Praxis for Community Food Security Education*, **Kim Niewolny**, **Michelle S. Schroeder-Moreno**, **Garland Mason**, **Amanda McWhirt**, and **Susan Clark** use the process of developing a graduate-level course on community food security to explore best practices in participatory action research and programming that fosters a mutually beneficial relationship between students and community members.

Rachel J. Weil, **Erin M. Silva**, **John Hendrickson**, and **Paul D. Mitchell** then explore issues of efficiency as an oft-neglected component of food system resiliency in *Time and Technique Studies for Assessing Labor Productivity on Diversified Organic Vegetable Farms*.

In our last open call paper, **Nathan A. Rosenberg** provides seminal exploration of farms that do not sell farm products but which may still contribute significantly to the rich and diverse agricultural economy, finding that they are disproportionately female and minority operated, in *Farmers Who Don't Farm: The Curious Rise of the Zero-Sales Farmer*.

We next present the first group of papers from the Enhancing Food Security in the Northeast (EFSNE) project. EFSNE researchers have submitted papers to both JAFSCD and to the *Journal of Renewable Agriculture and Food Systems* showcasing their ground-breaking work on understanding how regional food system approaches—which are larger and more complex than a local approaches—can affect food security. In this issue, we provide an introduction, a commentary, and two peer-reviewed papers accepted and published thus far. More papers will be published in Part 2 in the forthcoming winter issue (volume 8, issue 1). Please see *Introduction to the EFSNE Collection of Papers*, by **Christian J. Peters**, **Kate Clancy**, **C. Clare Hinrichs**, and **Stephan Goetz**, for more about each of the following papers:

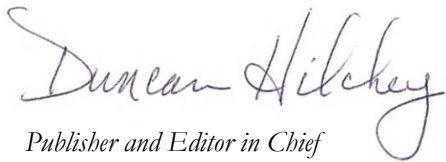
- *Using a Market Basket to Explore Regional Food Systems*, by **Kate Clancy**, **Alessandro Bonanno**, **Patrick Canning**, **Rebecca Cleary**, **Zach Conrad**, **David Fleisher**, **Miguel Gómez**, **Timothy Griffin**, **Ryan Lee**, **Daniel Kane**, **Anne Palmer**, **Kristen Park**, **Christian Peters**, and **Nicole Tichenor**.
- *Engaging Multiple Audiences: Challenges and Strategies in Complex Food Systems Projects*, a commentary by **Kathryn Ruhf**, **Kristen Devlin**, **Kate Clancy**, **Linda Berlin**, and **Anne Palmer**.
- *Exploring Public Perceptions of Regional Food Systems: Insights from Six Communities in the U.S. Northeast*, by **Anne Palmer**, **Raychel Santo**, **Linda Berlin**, **Alessandro Bonanno**, **Kate Clancy**, **Carol Giesecke**, **C. Clare Hinrichs**, **Ryan Lee**, **Philip McNab**, and **Sarah Rucker**.

And finally, we wrap up the issue with four book reviews:

- **Michelle M. Wander** reviews *Farm to Table: The Essential Guide to Sustainable Food Systems for Students, Professionals, and Consumers* by Darryl Benjamin and Lyndon Virkler.
- **Parke Troutman** reviews *Supersizing Urban America: How Inner Cities Got Fast Food with Government Help*, by Chin Jou.
- **Susan Valentino** reviews *Making Local Food Work: The Challenges and Opportunities of Today's Small Farmers*, by Brandi Janssen.
- **Emily Nink** reviews *No Table Too Small: Engaging in the Art and Attitude of Social Change*, by Laura Titzer.

Finally, please note that as we complete seven full volumes of JAFSCD, managing editor Amy Christian and I would like to express our heartfelt appreciation for the condolences we received this year after the loss of our beloved son Tom in June. While this will have a lifelong impact on our family, we continue to be fortified by the kindness and support of the JAFSCD community.

With appreciation,



Publisher and Editor in Chief



THE ECONOMIC PAMPHLETEER JOHN IKERD

Soul of the local food movement

Published online September 28, 2017

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The local food movement has emerged from the erosion of public trust and confidence in organic foods. The organic food movement emerged as a consequence of declining trust and confidence in the conventional/industrial food system. As organic foods grew in popularity, there was a call for their standardization and certification to maintain the integrity of the movement. National organic certification also made organic foods accessible to more people by allowing organics to move into mainstream food markets.

John Ikerd is professor emeritus of agricultural economics, University of Missouri, Columbia. He was raised on a small farm and received his BS, MS, and PhD degrees from the University of Missouri. He worked in the private industry prior to his 30-year academic career at North Carolina State University, Oklahoma State University, the University of Georgia, and the University of Missouri. Since retiring in 2000, he spends most of his time writing and speaking on issues of sustainability. Ikerd is author of six books and numerous professional papers, which are available at <http://johnikerd.com> and <http://faculty.missouri.edu/ikerdj/>

However, uniform organic standards also facilitated the consolidation of control of organic production by large agri-food corporations.

To maximize profits, corporate processors and retailers pressured organic producers to minimize production costs, which meant moving toward the minimum *enforceable* organic production practices. The social and ethical integrity of the organic movement couldn't be encoded in the sets of allowable and non-allowable organic inputs and production practices required for organic certification. Many organic consumers then turned to local

*Why an **Economic Pamphleteer**? Pamphlets historically were short, thoughtfully written opinion pieces and were at the center of every revolution in western history. I spent the first half of my academic career as a free-market, bottom-line agricultural economist. During the farm financial crisis of the 1980s, I became convinced that the economics I had been taught and was teaching wasn't working and wasn't going to work in the future—not for farmers, rural communities, consumers, or society in general. Hopefully my "pamphlets" will help spark the needed revolution in economic thinking.*

farmers to restore trust and confidence in the social and ecological integrity of their food. The philosophical mainstreams of the organic and local foods movements parted ways. Organic production surged ahead, but the heart and soul of organics were left behind (Ikerd, 2008).

Many factors have contributed to the growing popularity of local foods. However, the modern local food movement was born out of the industrialization of organics.

If the local food movement is to fulfill its transformational potential, it must not betray the trust and confidence of its customers and supporters. Local foods must be profitable, but profits must be understood as a means of pursuing the higher purpose of meeting the basic human need of all for appealing, wholesome, nutritious food. The ecological, social, and economic integrity of local foods depends on the willingness of people to give *purpose* priority over *profits*.

We can't *prove* the existence of purpose, at least not scientifically. That's why most scientists either deny or ignore it. Others relegate purpose to the realm of religion or metaphysics. However, a world without purpose simply makes no sense. Without purpose, there would be no way of discerning right from wrong or good from bad. If there were nothing in particular we were meant to do with our lives, then whatever we might choose to do, or not do, simply wouldn't matter. Without purpose, our life would be meaningless. That being said, if we accept the existence of purpose, we must accept it as a matter of faith, not fact—a spiritually rooted belief.

Conversation about purpose, meaning, and spirituality can be uncomfortable. Most people seem to be okay with expressions of spirituality by clerics, poets, writers, or scholars. However, few seem willing to integrate the common sense of spirituality into their everyday lives. The spirituality of food is accepted as prose but rejected as prescription. For example, in an interview with Bill Moyers, Wendell Berry said, "There are no sacred

and unsacred places; there are only sacred and desecrated places. My belief is that the world and our life in it are conditional gifts. We have the world to live in on the condition that we will take good care of it" Moyers, Winship, & Mannes,

2013, minutes 6:10 & 12:01).

Most people seem to embrace such statements with expressions of awe or reverence.

They openly accept the abstract idea of spirituality.

However, few seem willing to allow spirituality to guide their day-to-day lives, including the ways they make their living.

Perhaps a spiritually guided world reflects how most people think reality should be understood—but is

not and probably never will be. Regardless, those who give the spiritual reality of purpose and meaning priority over the tangible reality of profits and productivity risk being labeled naïve, idealistic, or at least unrealistic.

Like it or not, purpose is the driving force of the local food movement. The purpose of the local food movement, like the organic food movement before it, is to create a permanent, sustainable food system that is essential for humanity to fulfill its purpose for being here on earth. Berry suggests our life on earth is a gift that is conditioned on our fulfilling our responsibility for taking good care of it. As Pope Francis puts it, "The biblical texts... tell us to 'till and keep' the garden of the world (Gen 2:15). 'Tilling' refers to cultivating, ploughing or working, while 'keeping' means caring, protecting, overseeing and preserving....Each community can take from the bounty of the earth whatever it needs for subsistence, but it also has the duty to protect the earth and to ensure its fruitfulness for coming generations" (Francis I, 2015, para. 67). The local food movement must be profitable if it is to achieve that purpose, but profits are only the means, not the end.

The local food movement is but the latest phase of the sustainable agriculture movement, which is commitment to meeting the sustenance needs of all today while taking care of the earth to

**The ecological, social,
and economic integrity of
local foods depends on
the willingness of people
to give *purpose* priority
over *profits*.**

ensure its fruitfulness for coming generations. Sustainability is inherently purpose-based, and thus is inherently spiritual. If there were no purpose for human life on earth, why should we be concerned about its sustainability? If our purpose was to desecrate the earth rather than care for it, the world would be better off without us. We have a moral responsibility to care for others because we each have a sacred duty within the uniquely human purpose of caring for the other living and nonliving things of the earth. We are caretakers of the sacred earth.

The local food movement is a fragile reflection of the resolve of humanity to find some way to fulfill this awesome responsibility. Many people support local foods because they sense it is the “right thing to do”—even if they don’t see it as a sacred responsibility. They know the current industrial food system is not sustainable—but may not see it as a “weapon of desecration.” Industrial

agriculture will attempt to either destroy or co-opt and absorb any movement that threatens its supremacy. Any movement that prioritizes profits over purpose will be vulnerable to this ecological and social desecration.

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This not some theoretical, philosophical proposition. The consequences of a profit-driven food system are clear and compelling. Today’s industrial food system is neither meeting the basic food needs of all today nor ensuring that future generations will be able meet their needs for food. As Pope Francis suggests, those in the local food movement must continually

ask, “What is the purpose of our life in this world? Why are we here? What is the goal of our work and all our efforts? What need does the earth have of us?” (Francis I, 2015, para. 160). The local food movement must remain true to its purpose; it must not sacrifice its soul.



References

- Francis I. (2015, May 24). *Laudato Si'* of the Holy Father Francis on care for our common home [Encyclical letter]. Retrieved from The Holy See website: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papafrancesco_20150524_enciclica-laudato-si.html
- Ikerd, J. (2008, June 25–27). *Reclaiming the heart and soul of organics*. Paper presented at The Organic Summit, Boulder, Colorado. Retrieved from <http://faculty.missouri.edu/ikerdj/papers/BoulderOrganicSummitSoulOfOrganic.pdf>
- Moyers, B., & Winship, M. (Writers), & Mannes, E. (Director). (2013, October 4). Wendell Berry, poet & prophet [television series episode]. In Judy Doctoroff O'Neill (Executive producer), *Moyers & Company*. Public Square Media. Retrieved from <http://billmoyers.com/episode/wendell-berry-poet-prophet/>



**CULTIVATING COMIDA:
PUSHING THE BORDERS OF FOOD, CULTURE, AND POLITICS**
TERESA M. MARES

**Cacao fields and dairy cows: The interdependencies
between Mexican workers and the U.S. food system**

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The tamales that Miguel¹ pulled out of the large steamer pot as we sat down for our first interview in the summer of 2015 were a welcome treat as my stomach rumbled to remind me it had been several hours since my last meal. Wrapped in aluminum foil because banana leaves are difficult to find in the rural countryside of northern Vermont, these tamales connected Miguel to the

Dr. Teresa Mares is associate professor of anthropology at the University of Vermont. Her research focuses on the intersection of food and migration studies, and particularly how diets and foodways of Latino/a immigrants change as a result of migration. She is currently examining border politics and food access issues among Latino/a dairy workers in Vermont and is writing a book on this topic, entitled *The Other Border: Sustaining Farmworkers in the Dairy Industry*, under contract with University of California Press. Recent publications include “Navigating Gendered Labor and Local Food: A Tale of Working Mothers in Vermont,” in *Food and Foodways*, and a co-authored chapter, “Eating Far From Home: Latino/a Workers and Food Access in Rural

foodways of his home in Tabasco, Mexico. In his early 40s, Miguel is one of the 1,000 to 1,200 farmworkers from Latin American laboring in the state’s dairy industry. He first arrived in 2011 to secure the year-round employment that the industry promises and has worked at two farms during this time. Supporting his wife and five children, who remain at home in Tabasco, he has only returned home once in the past six years, though he makes it a point to speak with them by phone at least once a day. For 70 hours or more

Vermont,” forthcoming in *Food Across Borders: Production, Consumption, and Boundary Crossing in North America*.

Outside the classroom, Dr. Mares has led a number of community food projects. She is co-director of *Huertitas*, a food security project for Latino/a dairy farmworkers connected to UVM Extension’s *Bridges to Health Program*, and was previously co-director of the *Food Justice Project for the Community Alliance for Global Justice in Seattle*. She is devoted to experiential, transformative modes of teaching and has advised dozens of students who seek to make a difference in the contemporary food system. She can be reached at Teresa.Mares@uvm.edu.

¹ Per Internal Review Board guidelines, all names have been changed.

each week, Miguel works in a milking parlor at one of Vermont's larger dairies, a form of agricultural labor very different than tending the cacao fields of his extended family in Mexico.

I first met Miguel about a year after he arrived to Vermont, getting to know him through my work with Huertas. Huertas is a food security project that I co-direct alongside my colleague Naomi Wolcott-MacCausland through University of

Vermont Extension. Miguel had grown the black beans that filled the warm tamales as well as the ingredients of the fresh, but mild, salsa in the small garden that he tended behind his trailer with the support of the Huertas project. Unlike many Mexican men his age, Miguel loves to cook, engaging the skills he learned from his own father to recreate and share meals that remind him of home. Until just a few months before our interview, Miguel shared his small run-down trailer with two other men, both farmworkers from Mexico. One of them, Tomás, had returned to

his home state of Guerrero after nearly 40 years of working on and off in U.S. agriculture. The other, Ernesto, had recently found work on a different dairy farm in the same northern county. For nearly five years, I have engaged in ethnographic research with farmworkers in Vermont's dairy industry to better understand the complicated dynamics of how these individuals access food and what their challenges might reveal about the hidden dimensions of our food system. Since beginning this project in 2011, it has become clear just how much the proximity of the U.S.-Canada border—and in particular the enforcement of this border—complicates the lives of farmworkers in the state.

Vermont is a state of many contradictions and particularities. It is a verdant place, widely seen as an agricultural wonderland where the local food movement and community-based food systems have taken firm hold of the consumer imaginary and purchasing power. Our farmers markets and farm-to-table restaurants are full of incredible

bounty. At the same time, the state's agricultural economy is propped up by a concentrated dairy industry where immigrant workers labor and live in the shadows. According to the Vermont Dairy Promotion Council, Vermont currently sells more than 321 million gallons of milk each year, with 70 percent of agricultural sales coming from this single industry. Approximately 80 percent of the state's farmland is dedicated to supporting dairy

production. Dairy also accounts for 6,000 to 7,000 jobs (more than any of the state's private employers), providing US\$360 million in wages and salaries (Vermont Dairy Promotion Council, 2015).

As we see in other dairy-producing states, over the past 75 years Vermont has lost more than 90 percent of its dairy farms. In the 1940s there were approximately 11,000 dairy farms in the state; as of 2015 there were fewer than 900 (Sneyd, 2011; Vermont Dairy Promotion Council, 2015).

While a sizeable share of dairy farms (82%) have fewer than 200 cows, economic conditions have pushed Vermont's dairy farms to become larger with bigger herds to become more efficient and remain profitable, and to use more intensive milking technologies and schedules. The increased production of milk is facilitated directly by Latino/a farmworkers like Miguel and is also linked to our own shifting consumer demands, such as our newfound love of Greek yogurt and whey protein for our smoothies. While an industrialized and consolidated dairy industry might mean lower prices for consumers and profits for large dairy conglomerates, this continued exploitation of immigrant workers is at odds with building resilient, locally oriented food systems. In addition to the social sustainability concerns of the poor working and living conditions that many dairy workers experience, these workers are often excluded from participation and decision-making in the communities where they work.

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In the spring of 2017, I returned to Miguel's home for a follow-up interview, feeling a sense of urgency after the inauguration of Donald Trump because I knew that this seismic political shift was bringing with it a heightened sense of fear and anxiety to Vermont's farmworkers. When I asked him how things had changed for his in recent months, he responded with a sense of deep sadness, "There has been a change, since the new president entered. With the law that they are going to deport all of the migrants.

And because of this, a new terror began for us....We don't trust that we can go out. And if we go out, we are always looking over our shoulder for *la migra* or the police." Miguel is not unique in this regard; as I have visited with farmworkers and their families since the beginning of 2017, I have heard time and time again about their feelings of apprehension, uncertainty, and distress because of the new administration. As troubling as this may be, we must not forget that the targeting, detention, and deportation of undocumented immigrants, including those who work in our food system, is not in any way a new phenomenon.


As a border state, Vermont has a significant presence of Border Patrol and Immigration, Customs, and Enforcement (ICE) personnel, and this number has only increased since the attacks of September 11, 2001. Given this increased surveillance of the northern border, it has been characterized by some as being "Mexicanized," though of course the enforcement, topography, and cultural dynamics of the northern and southern U.S. borders are completely distinct (Andreas, 2005). During this period, Vermont has also seen an increased number of immigrants coming to work in its dairy industry. This shift began in the early 2000s, a period coinciding with an unprecedented scaling up of dairy production. As one of the whitest states in the nation (Vermont is currently the second least racially diverse state in the nation, trailing only Maine), these demographic changes have not gone unnoticed. This lack of racial and

ethnic diversity creates a situation where people of color are particularly visible when they enter public spaces, especially in rural areas of Vermont.

Miguel, for example, feels a great deal of apprehension when going grocery shopping, explaining, "When I go the store I go quickly, I get what I need and I go. I don't stay around looking for things because they'll detain me. I grab my things and I leave in a hurry. It's not safe." Here is a man who, through his labor, is responsible for pro-

ducing the dairy products that many of us enjoy—fearful when he is doing his own grocery shopping.

There is no easy answer to the predicament that is now confronting immigrant workers in our food system. According to the *2014 Hunger Report* (Bread for the World Institute, 2013), more than 70 percent of all farmworkers, about a third of meatpackers, and an estimated 10 percent of restaurant work-

ers in the U.S. are foreign-born. These figures are likely underestimates, given the off-the-books arrangements that many immigrant workers have with their employers. In Vermont, as well as in states across the nation, there is a serious concern about who will fill these positions in our food system should there be the promised ramping up of border enforcement and an increase in deportations of the "bad *hombres*" who are said to be invading our country. In a time of increased hysteria about our borders, what this anti-immigrant rhetoric fails to account for is how dependent our food security is on immigrant workers and the complex political-economic histories that have left millions of farmers like Miguel with limited livelihood options back home. With the viability of Vermont's agricultural economy centered upon a profitable dairy industry, and with this industry so dependent upon immigrant workers, Miguel's future is directly intertwined with those of thousands of Vermonters, most of whom he will never meet. The time is now for us to acknowledge and honor those who feed the nation rather than continuing to dehumanize and criminalize them. 

**With the dairy industry so
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References

- Andreas, P. (2005). The Mexicanization of the US-Canada border: Asymmetric interdependence in a changing security context. *International Journal*, 60(2), 449–462. <https://dx.doi.org/10.1177/002070200506000214>
- Bread for the World Institute. (2013). *2014 Hunger Report: Ending hunger in America*. Retrieved September 29, 2017, from <http://hungerreport.org/downloads/>
- Sneyd, R. (2011, July 8). *Total number of dairy farms in Vt. falls below 1,000* [Radio broadcast]. Vermont Public Radio. Retrieved from http://www.vpr.net/news_detail/91330/total-number-dairy-farms-in-vt-falls-below-1000/
- Vermont Dairy Promotion Council. (2015). *Milk matters: The role of dairy in Vermont*. Retrieved from http://vermontdairy.com/wp-content/uploads/2015/12/VTD_MilkMatters-Brochure_OUT-pages.pdf



DIGGING DEEPER

Bringing a systems approach to food systems

KATE CLANCY

Transdisciplinary and systems approaches to food security

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I've been writing for several years now about the importance and usefulness of applying systems concepts to work in food systems. Several of my JAFSCD columns have offered highlights from different reports issued by the National Research Council (NRC, 2010) and from the Institute of Medicine and National Research Council (Institute of Medicine & NRC, 2015) which have strongly

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called out the need for transformative food and agriculture research (K. Clancy, 2013; 2016). In this column, I want to focus on a report funded by the W.K. Kellogg Foundation (WKKF) and released in May 2017 by the Association of Public and Land-Grant Universities (APLU), entitled *The Challenge of Change: Harnessing University Discovery, Engagement, and Learning to Achieve Food and Nutrition Security*. Although directed to public research universities, most of the analyses and recommendations apply just as well to private universities and other institutions of higher education that are tackling food security and insecurity at all levels.

Like the authors of the earlier documents, the close to 200 people who contributed to the food security report agree that long-term food security is among the top, if not the primary, challenges facing the world—and one of the most complex. They also agree with the earlier reports that transformative research, which studies systems changes that are very different from the present system, should be more strongly emphasized (NRC, 2010).

This kind of research requires the use of system structures and concepts—with a special emphasis on adaptability and resilience. Applying systems thinking requires the involvement of a wide range of experts from multiple disciplines to “unravel the complexity of interactions in the food system” (p. 5). The report draws on and calls attention to the comprehensive literature on topics related to these approaches published over the last two decades.

One of the distinguishing characteristics of the report is its strong emphasis on one of the core tenets of transdisciplinary research: “focusing on shared problems and the active input of practitioners” (Brandt et al., 2013, p. 1).

Its authors acknowledge that universities often don’t engage with their surrounding communities, which may include those most affected by food insecurity. This situation is exacerbated by the lack of diversity within universities that perpetuates inattention to low-income communities, as well as communities of color.

The development of the report was led by a commission of university leaders, food security experts, and private- and public-sector officials from the U.S., Canada, and Mexico. Over 100 people served on interdisciplinary working groups and as expert advisors. Another 75 organizations were contacted for their input. Seven working groups, ranging from increasing sustainable food production to knowledge and education, were formed. (I was a member of the nutrition, human development, and health group.) Their work fed into seven challenges that included creating and sharing resources that will serve all populations, ensuring inclusive and equitable food systems, and addressing the dual burden of undernutrition and obesity to ensure full human potential. Analyses and recommendations from the working groups were brought together in sections describing each challenge, and are illustrated with examples of ongoing interdisciplinary research and programs on food-security issues from universities, nonprofits, and corporations across North America. These are followed by a

section on how and why research universities must work with others to create longer-term solutions to complex food-security issues.

I want to elaborate here on the report’s recommendations for institutional transformation:

1. Public research universities (and others as I mentioned above) should elevate food and nutrition security to a top priority. The report points out that universities are uniquely equipped to respond to the obstacles impeding progress toward food and nutrition security because of their subject-matter expertise across

disciplines, and their domestic and global experience. At this point, these institutions need to understand much better how factors causing food insecurity in the U.S. and globally, such as racism and poverty, interact with each other. And what they learn needs to be quickly translated into policy briefs that explain both the implications of the research and the implications of policy for public audiences. One of the charges to

the commission was to identify next steps on how to “enhance substantial government investment” to advance food and nutrition security. This can’t be accomplished without compelling arguments derived from research and experience, and also policy research that can identify unintended consequences of policies, winners and losers in policy debates, and benefits and costs of policy alternatives.

2. Significant changes are needed to accomplish this, leading to the second recommendation that university resources and structures for transdisciplinary approaches should be aligned. Most universities do not reward or acknowledge faculty members’ contributions to transdisciplinary research, so changes are needed in organizational structures, resource allocation, faculty incentives, and criteria for faculty promotion and tenure. The efforts to build inter- and trans-disciplinary structures and teams at

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some U.S. universities need to be taken up by many more institutions. These efforts, however, take time and resources, and the need comes just as U.S. federal and state agricultural research budgets continue to shrink (M. Clancy, Fuglie, & Heisey, 2016; Monke, 2016). My feeling is that new and much more creative efforts must be made to change the situation. These efforts should include the development of new strategies by groups of committed leaders (university presidents and deans), research scientists from the biophysical and social sciences, other stakeholders (including both nonprofit and for-profit organizations), and policymakers who recognize the importance of agricultural research and the straits in which it finds itself at present.

3. Institutions should enhance and build new university-community relationships. The authors state that this report represents a strong commitment to university engagement with external stakeholders as a “primary vehicle through which universities can realize impacts on food and nutrition security” (p. 19).

This translates into the challenge of making changes in university cultures, operations, funding relationships, and activities so that university teams actively interact with communities throughout the entire research process and commit to mutually beneficial engagements that include community ownership and leadership. Furthermore, populations affected by food insecurity, which includes women, youth, the poor, and marginalized groups, should be engaged in setting agendas and have access to research findings and other relevant information. Among other things, the report suggests that universities establish strong networks outside the agriculture and fishing communities, such as architects, urban planners, and energy scientists, as well as public

and private, profit and nonprofit entities in all sectors that cut across food, agriculture, and health. These strategies underscore the importance of revitalizing the influence of publicly funded research and increasing long-term interdisciplinary basic and applied research efforts. The present scheme of mainly short-term, project-based funding deprives community residents and the experts working alongside them “of autonomy, self-determination, and respect” (p. 74).

Furthermore, although many North American universities are located in areas where food insecurity is high, most of the faculty and students working on international nutrition

and food security in those institutions are disconnected from this more proximate problem. My observation over the past 25 years is that researchers who have worked overseas are much more likely to understand and employ systems approaches in their projects and courses. This expertise could be put to good use in domestic settings, thus enriching both local and global efforts.

Researchers who have worked overseas are much more likely to understand and employ systems approaches. This expertise could be put to good use in domestic settings.

4. A new generation of students needs to be educated on how to solve transdisciplinary problems. In fact, the report states that this is “the most fundamental means to address the lack of systems-level understanding and critical thinking on global food security” (p. 115). This challenge requires, among other things, new curricula that balance the necessary disciplinary expertise with a strong interdisciplinary and transdisciplinary focus. Teachers should be aware of their role in training future policy-makers and policy analysts who can work with scientists and stakeholders, including community organizations. They also should make their education and outreach efforts more connected to students’ needs, such as in some cases students’ own food insecurity, or in other

cases students' lack of exposure to and understanding of hunger.

The report argues that the problem of food and nutrition security is of a magnitude that demands making tough decisions and taking bold action. In fact, the report states that “refusing to act to address food insecurity *is* [emphasis added] a decision” (p. 111), which I believe should weigh on anyone working in the food and agricultural arena.

As I was completing this essay, I read about a book to be released in 2018 calling for a fundamental restructuring of land-grant universities, charging them with having abandoned their mission of serving the people in their states and regions (Wermund, 2017). The APLU report amplifies this charge and offers numerous ways by

which these universities can recover their proper and relevant role. They could start with a commitment to engage much more extensively with their communities on food security research and programs. They could also interpret research recommendations for practitioners and offer pathways for them to assist in developing new transdisciplinary projects with university and other partners, and to improve the activities and outcomes of present projects.

Faculty members, staff, and administrators should advocate for more funding for agricultural research as a whole, with a particular emphasis on systems research. Finally, institutions need more internal advocates and volunteers to develop strong interdisciplinary curricula and courses that expose undergraduate and graduate students to inter- and transdisciplinary concepts.

References

- Association of Public and Land-Grant Universities [APLU]. (2017). *The challenge of change: Harnessing university discovery, engagement, and learning to achieve food and nutrition security*. Retrieved from <http://www.aplu.org/ChallengeofChange>
- Brandt, P., Ernst, A., Gralla, F., Luederitz, C., Lang, D. J., Newig, J.,...von Wehrden, H. (2013). *A review of transdisciplinary research in sustainability science*. *Ecological Economics*, 92, 1–15. <https://dx.doi.org/10.1016/j.ecolecon.2013.04.008>
- Clancy, K. (2013). High-priority research approaches for transforming U.S. food systems. *Journal of Agriculture, Food Systems, and Community Development*, 3(4), 5–7. <http://dx.doi.org/10.5304/jafscd.2013.034.021>
- Clancy, K. (2016). The many uses of a new report on food systems assessments. *Journal of Agriculture, Food Systems, and Community Development*, 6(2), 9–12. <https://dx.doi.org/10.5304/jafscd.2016.062.006>
- Clancy, M., Fuglie, K., & Heisey, P. (2016). U.S. agricultural R&D in an era of falling public funding. *Amber Waves*, November. Retrieved from <https://www.ers.usda.gov/amber-waves/2016/November/us-agricultural-rd-in-an-era-of-falling-public-funding/>
- Institute of Medicine [IOM] & National Research Council [NRC]. (2015). *A framework for assessing effects of the food system*. Washington, D.C.: The National Academies Press. <https://dx.doi.org/10.17226/18846>
- Monke, J. (2016). *Agricultural research: Background and issues* (CRS Report No. R40819). Washington, D.C.: Congressional Research Service. Retrieved from <https://www.crs.gov>
- National Research Council [NRC]. (2010). *Toward sustainable agricultural systems in the 21st century*. Washington, D.C.: The National Academies Press. Retrieved from <https://dx.doi.org/10.17226/12832>
- Wermund, B. (2017, November 14). *Have land-grant universities lost their way?* [Blog post]. Politico Morning Education. Retrieved from <https://www.politico.com/newsletters/morning-education/2017/11/14/have-land-grant-universities-lost-their-way-223344>



**FREEDOM'S SEEDS:
REFLECTIONS OF FOOD, RACE, AND COMMUNITY DEVELOPMENT
MONICA M. WHITE**

**Collective agency and community resilience:
A theoretical framework to understand agricultural resistance**

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In 1962, Ms. Fannie Lou Hamer traveled to the county seat in Indianola, Mississippi, in order to register to vote. This wasn't her first time and it wouldn't be the last. Although she had been warned with threats of violence and threats of death, she was determined to continue until she was able to exercise her right to participate in electoral politics.

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Upon her return to the Marlow Plantation, the plantation owner, W.D., confronted her. She had been a dedicated employee for 18 years as a sharecropper, time- and recordkeeper, cook, and domestic. He told her to withdraw her application for voter registration or leave. Her home, as paltry as it was, was a condition of her employment and that of her husband, Pap. Like many African Americans, she faced homelessness and joblessness as the price of political participation. She must have feared with good reason that she would be lynched.

Rather than withdraw her application for voter registration, the Hamers left. Fannie Lou said later, "They kicked me off the plantation; they set me free. It's the best thing that could happen. Now I can work for my people." It was a pivotal moment for her. She was able to turn her attention toward fighting for social justice and civil rights for others, especially sharecroppers, tenant farmers, and domestic workers who, like her, found themselves shackled to economically

oppressive conditions that held them hostage and demanded their silence and acquiescence. Seeking to address the conditions of absolute poverty, political disenfranchisement, the denial of medical care and access to education that plagued generations of Black residents of Mississippi, Hamer turned her efforts to pooling the community's agricultural skills as a strategy of resistance and survival. Freedom Farms Cooperative (FFC) would ultimately own over 680 acres (275 hectares) collectively, with a pig bank,¹ community gardens, sewing cooperative, catfish cooperative, Head Start program, commercial kitchen, garment factory, sewing cooperative, tool bank, and low-income, affordable housing. It offered health care and disaster relief and educational and re-training opportunities. African Americans who were fired and evicted for seeking full access to their rights as citizens, as Hamer had been, had a place to go. Freedom Farms offered options to sharecroppers and tenant farmers who wanted to stay in the Mississippi Delta.

It is difficult to overestimate the impact that Freedom Farms must have had in its brief

existence. The people it served had been sharecroppers, tenant farmers, domestic workers—completely beholden to those who had exploited their family's labor for generations. Their bosses actively sought to recreate the conditions of slavery, and the dominant economic and political systems catered to their desires. What must it have been like to be able to live, work, and build with others as equals at FFC? The agricultural knowledge that had been so long exploited was turned into resistance and power.

FFC and other agricultural cooperatives were founded on the notion that growing food would be a strategy toward self-determination and self-reliance. They offer today's urban farmers an idea and a strategy. Based upon my own analysis of over 40 Black agricultural cooperatives, the approach that FFC and other cooperatives enacted demonstrate the theoretical framework of Collective Action and Community Resilience (CACR), with the strategies of commons as praxis, economic autonomy, and prefigurative politics.² These overlapping strategies encompass the ideological/social, political, and economic aspects of community



The Pig Bank at Freedom Farms.

(Photo by Franklynn Peterson and used with permission)

¹ FFC was the first Heifer International project that initiated the pig bank as a way to support impoverished families. Known as a community micro-lending strategy where a family would receive a pregnant sow, care through its pregnancy and then remit two shoats. Piglets reach full maturity in two years and could either be mated or slaughtered for meat and/or sold

for supplemental income.

² This theoretical perspective is based upon data analysis of Black agricultural cooperatives and appears in my forthcoming book, *Freedom Farmers: Agricultural Resistance and the Black Freedom Movement*, to be published by the University of North Carolina Press in 2018.

reliance and community determination as strategies for freedom and liberation. For example, a single institution, such as community school—created to educate Black children in the context of Jim Crow laws depriving them of public education, may have been economically autonomous as well as demonstrating prefigurative politics and commons as praxis.

Commons as Praxis

The members of FFC believed that it was critical to both share resources and discuss how such resources should be used. Agricultural implements such as seeds, fertilizer, tools, and labor were shared. They also discussed how land should be used, how to choose the value-added products that would yield the highest profit, and the ways to market these products to African Americans in Mississippi and beyond, demonstrating the principle of commons as praxis.

For many agricultural cooperatives that Black people created between Reconstruction and the 1960s, including FFC, the development of commons as praxis is a critical transition in the ways that members of oppressed communities think and organize. Commons as praxis engages and contests dominant practices of ownership, consumerism, and individualism and replaces them with shared social status and shared identities of race and class. It functions as an organizing strategy that emphasizes community well-being and wellness for the benefit of all. It is based on the premise that pooling resources can transcend the limitations of individual strength in oppressed communities. It emphasizes the shared ideology and the cooperative and collective behaviors that arise in response to the conditions of oppression. Community decisions made around shared spaces and resources such as access to land, water, and seeds are an example of commons as praxis.

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Prefigurative Politics

Ms. Hamer's most notable recognition was her televised testimony before the Credentials Committee of the Democratic National Convention to demand that the multiracial Mississippi Democratic Freedom Society, created to increase African American voter registration, also challenge the legitimacy of the all-White Mississippi delegation. Her inability to participate in electoral politics in the land of her birth because of her race was an injustice that she was not willing to accept. Surely her testimony and the rising civil rights struggles throughout the country contributed to passage of the Voter Rights Act of 1965. But widespread voting for African Americans would take time to implement. While participation in national electoral politics may have elided many African Americans, the agricultural cooperatives they created emphasized democratic decision-making and full partici-

pation as a way to teach democracy, thereby demonstrating the strategy of prefigurative politics.

Prefigurative politics refers to the construction of alternative political systems that are democratic and include processes of self-reflection. Also referred to as “everyday utopias” (Cooper, 2009), place-based alternative practices (Escobar & Harcourt, 2005), and alternative experiments in everyday living (Futrell & Simi, 2004; Polletta, 1999), these political systems involve several progressive components, including free spaces and democratic representation.

Prefigurative politics begins with the awareness that members of a group have been excluded from the political process of the society in which they live. The group responds by developing free spaces to meet without fear of repression to share their grievances and foster and discuss innovative ideas that will help them move toward freedom and liberation (Evan & Boyte, 1986; Gooch, 2001; Rao & Dutta, 2012). Free spaces are critical for understanding, interrogating, and engaging democratic

and revolutionizing principles that stand in stark contrast to the structures identified as oppressive. Through political education, community members engage in consciousness-raising and information exchange, which allows them to think creatively about the current political situation and how they would re-conceptualize those arrangements. It allows them to consider alternative ways of engagement with power that include principles of community self-determination and community self-reliance.

At the individual level, prefigurative politics introduce community members to new ideas that encourage new ways of being, along with a greater sense of freedom and independence, and thus create the opportunity to move from conditions of oppression to conditions of self-sufficiency and self-determination. At the community level, in the spaces prefigurative politics create, members of oppressed groups are able to speak freely and to strategize and offer political education and politicization to members of the group; they can move from describing and discussing the conditions of oppression to strategizing and conceptualizing a movement toward freedom and liberation. Within these spaces members engage in democratic practices. Community members create the opportunity to practice democracy when they have been excluded from it in the rest of the world. Once a community creates new ways of decision-making and acting with political autonomy, the importance of an economically independent and autonomous community becomes apparent and necessary.

Economic Autonomy

Given the nature of the economic and racial exploitation inherent in the history of Southern agriculture, including structures of sharecropping, tenant farming, and Jim Crow legislation, economic autonomy was a critical dimension of community resilience and collective agency. In response to

economic exploitation, and in opposition to a resource-extraction model where all forms of economic participation support the status quo, efforts to establish economic autonomy created an alternative system of resource exchange within the community. These funds and resources had direct benefits for the members of farming cooperatives such as FFC.

The pursuit of economic autonomy allows a community to provide for its members financially and help them move from dependence to indepen-

dence, and from powerlessness toward a position of power.

Economic autonomy often involves creating an alternative economic system, such as replacing the exchange of federal currency with a barter system that rewards labor or produce. Building economic autonomy thus creates a platform for working to end social, political, and economic oppression. By developing an independent system, a community

could begin to extract its members from an oppressive system at the same time that it built capacity through fostering new forms of collective self-governance.

Collective Agency and Community Resilience

Collective agency and community resilience describe the strategies that members of agricultural cooperatives implemented in an effort to stay on the land using their agricultural knowledge base. In doing so, these organizations taught ways to participate fully through prefigurative politics, to work toward economic independence through value-added products. They shared the collective resources as described by commons as praxis. Many of these agricultural cooperatives had a short life span, not at all as a result of their courage and bravery, but because their courage and bravery demonstrated that a community that is able to work collectively, grow its own food, and create a community based on shared goals was threatening to the White political establishment that had long

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withheld civil and human rights from those who worked their lands.

A Strategy for the Future

The food justice movement is actively engaged in questions about using resources and unearthing missing voices in agriculture. I propose that in this endeavor it is helpful to look back at the strategies agricultural cooperatives such as FFC employed in the past. Social justice was deeply woven into their DNA. The strategies they used and the objectives they embraced should serve as a model for the movement in the future. Ms. Fannie Lou Hamer described the strategy of the White power structure in Indianola as a

starvation plan (White, 2017). Her understanding that owning the means to grow healthy food was the key to empowerment should guide the food justice movement in the future.



...Down where we are, food is used as a political weapon. But if you have a pig in your backyard, if you have some vegetables in your garden, you can feed yourself and your family, and nobody can push you around. If we have something like some pigs and some gardens and a few things like that, even if we have no jobs, we can eat and we can look after our families.

—Fannie Lou Hamer
(quoted in Height, 2005, p. 188)

References

- Cooper, D. (2009). Intersectional travel through everyday utopias: The difference sexual and economic dynamics make. In E. Grabham, D. Cooper, J. Krishnadas, & D. Herman (Eds.), *Intersectionality and Beyond: Law, Power and the Politics of Location* (pp. 299–325). New York: Routledge-Cavendish.
- Escobar, A., & Harcourt, W. (2005). Practices of difference: Introducing “Women and the Politics of Place.” In W. Harcourt & A. Escobar (Eds.), *Women and the Politics of Place* (pp. 7–14). Bloomfield, Connecticut: Kumarian.
- Evans, S. M., & Boyte, H. C. (1986). *Free Spaces: The Sources of Democratic Change in America*. New York: Harper & Row.
- Futrell, R., & Simi, P. (2004). Free spaces, collective identity, and the persistence of U.S. white power activism. *Social Problems*, 51(1), 16–42. <https://doi.org/10.1525/sp.2004.51.1.16>
- Groch, S. (2001). Free spaces: Creating oppositional consciousness in the disability rights movement. In J. Mansbridge & A. Morris (Eds.), *Oppositional Consciousness: The Subjective Roots of Social Protest* (pp. 65–98). Chicago: University of Chicago Press.
- Height, D. (2005). *Open Wide the Freedom Gates: A Memoir*. New York: PublicAffairs.
- Polletta, F. (1999). “Free spaces” in collective action. *Theory and Society*, 28(1), 1–38. <http://www.jstor.org/stable/3108504>
- Rao, H., & Dutta, S. (2012). Free spaces as organizational weapons of the weak: Religious festivals and regimental mutinies in the 1857 Bengal Native Army. *Administrative Science Quarterly*, 57(4), 625–668. <https://doi.org/10.1177/0001839212467744>
- White, M. M. (2017). “A pig and a garden”: Fannie Lou Hamer and the Freedom Farms Cooperative. *Food and Foodways: Explorations in the History and Culture of Human Nourishment*, 25(1), 20–39. <https://doi.org/10.1080/07409710.2017.1270647>

Urban agricultural and sustainability program at Houston's downtown university: Combining new curriculum, hands-on projects, and a hurricane

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Abstract

The University of Houston–Downtown (UHD), a Hispanic-serving institution, launched an educational program in 2016 that engages undergraduates in a summer curriculum with a hands-on project focused on urban agriculture and sustainability. The goals are to deliver new content, create purposeful interdisciplinary teams, and engage the participants, who are largely students of color, through mentoring and professional-development activities. In this reflective essay, we discuss improvements made between the first and second year and program elements that were most effective. The 2017 cohort was simultaneously engaged in two courses and the creation of an

aquaponics system. Each student group created a system that could grow fish and hydroponic plants using solar energy. Qualitative student survey results indicate that the program increased student knowledge and affected career directions. The program was designed to extend mentoring from the summer through fall to optimize projects and prepare students for presentations on and off-campus. However, these plans had to be modified as Harvey, the most damaging hurricane in U.S. history, flooded the school and destroyed the student aquaponic systems. Fall plans now include rebuilding a single aquaponics system and consideration of resiliency in future sustainability initiatives. The most critical elements of this

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program have been shown to be students' intense immersion in curriculum and projects, creating cross-disciplinary student groups, mentoring across the program, and, finally, maintaining flexibility. The hurricane's incursion into our program also stands as a powerful backdrop for discussions not only at our university but nationally of how we create sustainable communities and agricultural systems in a world that will continue to experience climatic changes.

Keywords

Urban Agriculture; Undergraduate; Aquaponics; Hydroponics; Curriculum; Mentoring; Hurricane; Sustainable Development; Renewable Energy Systems; Resilience; Climate Change

Introduction

This is a reflective essay about a recent collaborative summer program at the University of Houston–Downtown (UHD). The two faculty mentors who designed this program come from different departments. Lisa Morano is faculty in the Department of Natural Sciences with an ecology and agricultural background, and Vassilios Tzouanas is from the Department of Computer Science and Engineering Technology with a chemical engineering and sustainable energy background. We planned to develop a collaborative summer program for undergraduates that combined curriculum and a hands-on project to accomplish several goals. First, we wanted to expose students to challenges and technical solutions to address urban agriculture and sustainability. These topics are not covered in standard biology or engineering technology curriculum. Second, we wanted students to work together in cross-disciplinary teams. This is the reality students will encounter when they enter the workforce, and we wanted to include it in their educational experience (Clark, 2006). The 2017 cohort worked in groups to build solar-powered aquaponic systems in the UHD Sustainability Garden. Third, we wanted our program to develop soft skills and student confidence so our students would be more successful in their future careers. Given the devastating flood that has just impacted the entire Houston region, a fourth goal is emerging. This goal will be to model resiliency

for our students and consider the role of resiliency in teaching about and creating sustainable systems.

Houston is the ideal place to educate the next generation about urban agriculture and sustainability. Houston is the fourth largest city in the country and the fastest growing large city in the U.S. Houston is also the most diverse city in America (Mejia, 2017, p. 2). Houston is home to numerous colleges, including private universities and a large multi-institutional medical center. The University of Houston system is the regional public university system, which comprises four separate universities, each with its own mission and population. UHD is the urban university at the heart of Houston. It is a commuter university with over 14,000 students, and its diversity matches the city of Houston. The UHD student body is 46% Hispanic, 23% Black, 17% White and the remaining percentage is Asian and other ethnicities (UHD, 2017). The student body also includes a number of nontraditional students returning to college to finish their degree. Approximately 80% of the students are eligible for Pell grants, which indicates that they are on average below the official federal poverty threshold. The mission of UHD includes a focus on academic and career preparation, and it is an inclusive community dedicated to integrating research, teaching, and community service (UHD, 2016).

Like many urban, commuter schools, UHD has challenges. Urban students have limited time as many are working full- or part-time and may have families. Serious time constraints negatively affect their ability to take advantage of opportunities (Hammer, Grigsby, & Woods, 1996). We have made several additional observations about UHD students. First, they do not have access to information about agriculture or sustainability. Texas does have large schools that specialize in these subjects, but they are the larger land-grant universities. These universities are often not an option for urban students who may not be able to leave home, have limited financial resources, have not had adequate high school preparation for entrance, or who are coming back to school. Second, we know that our students learn well through hands-on projects that are related to coursework. The reality is that this approach works well for all

students by engaging them in active construction of the concept and increasing social interaction (Krajcik & Blumenfeld, 2006). Finally, we know that many of our students lack the confidence and professional-development skills to pursue jobs for which they may be well suited. Many students at UHD are the first in their family to go to college. Our students, like other first-generation and low-income students, often perceive early failures as a lack of ability on their part rather than a step in the process of learning (Thayer, 2000). We also know students are often unclear about how to get into graduate school or enter the professional job market. Mentoring can be a critical component of academic success (Jacobi, 1991), and we know from personal experience it builds student confidence and give students personalized information vital for professional success. The challenge is to scale up the typical one-on-one mentoring to influence more students.

One additional motivation to build our collaborative program grew from a critical social justice issue in Houston. Its poorer neighborhoods are likely to be in food deserts. These food deserts are usually in impoverished neighborhoods and are defined as regions of limited fresh or healthy foods due to a lack of grocery stores or other food providers (U.S. Department of Agriculture, Economic Research Service [USDA ERS], n.d.). The problem is not a simple one to fix. Food deserts are complex and have economic, transportation, social, and educational components to be addressed. As with all problems, the most effective way to implement change is from within the neighborhoods. Many of UHD's students live within Houston's food deserts areas. As an urban university, one of our obligations should be to give the students who live in food deserts the knowledge, skills, and confidence they need to be the future leaders in their communities. Our long-term goal through education is to give students the tools to translate what they have learned into action and to make change in their neighborhoods.

Natural disasters are the ultimate reminder that humans are inhabitants, not legislators, of the planet. Western culture has numerous narratives about the interactions of humans on the planet.

There is the narrative that the pristine earth has been trampled and what remains should be protected and preserved; there is the narrative that humans have a right and dominion over the planet's resources for our own gain; and there is the narrative that science, technology, and capitalism can be aligned in partnership with nature to create a path toward a sustainable future (Merchant, 2013). Resiliency is also a critical ingredient in the model of a sustainable future (Klotz, 2016). How resilient are our cities, industries, and approaches to problem-solving in a world that will get warmer and reach 9 billion people in the next generation? Given the hurricane that struck the Houston area in August 2017, the role of resiliency in creating sustainable programs and systems will need to be incorporated into our discussions and design of our current and future programs at UHD and more broadly in the Houston region. The scientific data predicts that global warming will bring more disasters and warmer oceans will bring more devastating storms (Intergovernmental Panel on Climate Change, 2012). This will affect all future jobs, but it is particularly critical that students pursuing jobs related to sustainability have the skills to analyze data and build solutions that account for such a future.

Hurricane Harvey and the subsequent tropical storm will likely serve as a valuable backdrop to teaching resiliency and sustainability. Harvey dropped between 40 and 50 inches (102 to 127 cm) of rain in the Houston area over four days at the end of August 2017 (National Hurricane Center, 2017). Houston does have engineering for flood events, but the region is unquestionably flat and has experienced enormous development over the last two decades. Subsequently, the region was overwhelmed; it was estimated in early September that 33,800 people had to flee to shelters (Federal Emergency Management Agency [FEMA], 2017). Every resident of the region was impacted. UHD was flooded to its first floor, and the student aquaponic systems built in the summer of 2017 and most of the UHD Sustainability Garden were swept away. It will be impossible to ignore the impacts of the storm on our university and our students. As academics, we must model the path

forward of resiliency in action. We will work with students to rebuild the garden and the aquaponics systems. We will incorporate discussions of resiliency in creating the most sustainable systems of food, energy, and housing for both Houston and our future world.

Methods: Program Logistics

Program Initiation

UHD established the Center for Urban Agriculture and Sustainability (CUAS) two years ago with funding from a USDA National Institute of Food and Agriculture (NIFA) grant. This grant runs for four years and supports the creation of a new curriculum at UHD and a summer Experiential Learning through the Center for Urban Agriculture and Sustainability (EL CUAS) program. EL CUAS involves 10 students each year for an intense summer program that has obligations both in the spring before and the fall following the program. This is our second year of EL CUAS, and we will use the 2017 program as the reference and where applicable describe changes made between 2016 and 2017 to improve the program.

We advertise the program in the fall through digital fliers and direct encouragement of students we know. We meet with students a couple times prior to the start of the summer program to discuss logistics. The summer program lasts half the summer and requires students to be on campus daily from 9:00 a.m. to 5:00 p.m. In 2017 students were engaged in two summer courses, hands-on creation of a sustainable system, and professional-development activities. Students receive a stipend of US\$2,000 for engaging in the program, which they can use to cover the cost of courses or for living expenses while engaged in the full-time program.

Design of the Curriculum

We designed two courses that were incorporated into the summer program. The courses are SUST 2301, Fundamentals of Sustainability and SUST 3301, Renewable Energy Systems. These courses will also be included in a new minor in sustainability offered by UHD. Therefore, the courses are not only a requirement of the summer program, but they also count toward the minor, should

students choose to pursue further sustainability studies. Topics covered in Fundamentals of Sustainability include economics, planetary boundaries and climate change, social inclusion, education, food security, healthcare, resilient cities, and sustainable development. The Renewable Energy Systems include modules on the history, design, and engineering technology of wind, solar, and geothermal energy, and biofuels. The courses have limited prerequisites (second semester English) and no hidden science prerequisites so that they are open to any major. In summer 2017 the courses were taught on alternating days in the summer. The hands-on project of building a renewable system was linked to the curriculum of each course such that each course required a group project, group report, and oral presentation. There was also fluidity between the class and the lab space where projects were assembled so students could apply theory from class, such as how to connect up a solar panel to generate power (Figure 1).

Hands-on Project

In spring of 2017, the 10 students in the program met to decide on a summer project. The requirements were to build a system that would help solve a food scarcity issue in an urban environment while being sustainable with respect to energy consumption. The group settled on building solar-powered aquaponic systems that would allow students to raise fish in a tank and then use the waste from the fish to fertilize hydroponic plants. The students were assigned to three groups; each group had to design, build, and evaluate its system. Each group had students that were biology majors and engineering technology majors, and one group had an interdisciplinary studies major. Not only was completion of the system an obligation of the summer program, but also it was incorporated into the curriculum of the two courses. The two faculty mentors also applied for and were awarded a high-impact practices internal grant from the UHD Center for Teaching and Learning Excellence. This internal grant allowed for a budget of US\$1,000 per group to build their system. Students were required to create a preproposal and detailed budget early in the program and to make a final report and oral presentation at the end.

Professional Development

Several professional-development activities were incorporated into the program. In 2017 we took a field trip to a Houston high school where a teacher had established a successful aquaponics system. We also took a field trip to the regional Texas AgriLife Extension office to learn about the research experiments and community-engagement activities in which the extension officers participate. On Fridays we established a pot-luck lunch meeting with guest speakers. The goal of all of these activities was to create a relaxed atmosphere where faculty and students could interact with each other and the guests. Guest speakers included the director of the UHD Career Center, who talked about building a résumé, networking, and landing an interview; the director of the UHD Center for Critical Race Studies and faculty of English, who discussed diverse perspectives and the power of writing; the

director of the UHD Center for Public Deliberation, who led a discussion on interpretation of data and the role of public deliberation in creating positive community action; and the assistant vice president for the Office of Research and Sponsored Programs, who led a discussion in mastery versus performance-based goals and their role in professional success.

Changes from 2016 to 2017

At the end of 2016, we scrutinized our program for areas of improvement. We wanted to improve the interaction across disciplines. In 2016 we had science projects (growing plants, extracting DNA, and testing plants for the presence of GMOs) and engineering technology projects (building solar irrigation systems in a community garden). We observed that the students segregated by discipline and it was difficult to maintain the integration of



Figure 1. Photo of 2017 Program Participants

Clockwise from front left: Jennifer Herrera, Jonathan Garcia, Yarmilla Reyes, Brayan Calvo, Sara Lyons, Andrea Hain, Isaias Gonzalez, Sarah Graeber, Glen Wood, Sergio Diaz, and Lisa Morano.

students by major. To address this, we created more purposeful mixed groups in 2017, and the groups were given the combined assignment of building a system with specific biological and engineering requirements. In 2016 the curriculum was in the spring semester before the summer program. In 2017 the curriculum was incorporated into the daily activities of the program so that the hands-on project and concepts in class reinforced each other. In 2017 we also were awarded the internal grant funds which allowed us to give each team a supply budget to manage.

Program Outcomes

Program recruitment has been most successful by word of mouth and personal outreach to students in our classes. A personal email or conversation with a student appears vastly more effective than blanket emails or digital screen advertisements around the campus. It is a program goal to include students from across the entire university, but personal recruitment has resulted in student cohorts heavily represented by biology and engineering

technology majors. We need to determine effective ways to reach students outside the programs where we teach.

The 2017 integration of majors into assigned groups has created cross-disciplinary teams that fostered more cohesive teamwork. Each group was given specific instructions that the entire group must be involved in the engineering and biological functionality. We introduced the mixed groups with complete transparency, explaining that one of the goals was for each member of the team to gain knowledge and skills that others may be better at (e.g., calculations, electrical work, knowledge of the nitrogen cycle). These explicit instructions created a positive learning environment. Students also all worked on their projects in one large engineering lab, and this appeared to create a more cohesive experience than was observed the previous year, when students were separated.

Combining course curriculum and the project resulted in strong engagement in the content and a high quality of projects. In our first year we taught the required curriculum in the spring prior to the

summer program. With the required courses held during the summer, the students were not distracted by other courses. The requirement that students and faculty be engaged in an all-day program allowed the faculty to offer bonus lunch-time lecture reviews to make sure no one fell behind in the curriculum. Linking of the coursework to the project improved the engagement in the curriculum. Making the project a large portion of the course grade and including project benchmarks in class

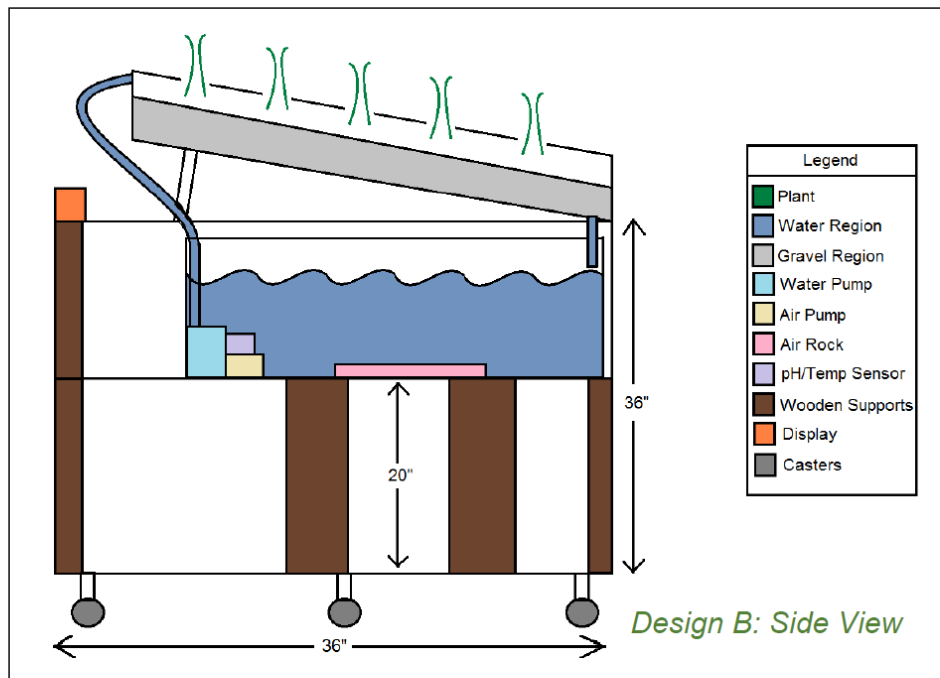


Figure 2. Sample Schematic of Student-designed System that Will Support Fish and Hydroponic Plant Growth

This is the schematic proposed, designed, and built by students Glen Wood, Jonathan Garcia, and Jennifer Herrera.

kept the projects progressing and resulted in very professional aquaponic systems at the end of the program. Each student group settled on a final design that had to be drawn up in schematic form (Figure 2). Each design was a unique design on a pump system that would take the fish waste, pump it through an area to grow plants, and then return the clean water to the fish. Completed systems were all functional and connected to solar-power panels placed in the UHD Sustainability Garden.

Complete immersion in the curriculum and project also allowed us to cover a great deal of content and to have discussions where content in courses intersected or applied to the project. Students used calculations from the Renewable Energy Systems class to determine how much solar power they would need from their system and how the cost of this system compared to systems that use fossil fuels. In Fundamentals of Sustainability, students learned about the complex interdependence of environmental science and growing food, social justice issues related to creating equitable, sustainable systems, and the role of economics in making sure a sustainable system will be adopted. The degree to which the program shifted knowledge was measured by the external evaluator for the program. The students' ability to define "sustainable resources" went from a baseline of 50% to 100%, "ethical labor practices" went from 50% to 80%, "renewable energy" went from 80% to 100% and "urban agriculture" went from 40% to 100%.

The program shifted students' interest toward sustainability and urban agriculture. There was an increase in the number of students interested in pursuing the minor in sustainability. A few students are seniors and will not have time to include the sustainability minor in their degree before graduation. Of the remaining seven students, five plan to pursue the minor. There was also a shift in career goals. Five of the students plan to pursue graduate school or medical school, and all have indicated an interest in sustainability, conservation, or sustainable public health. Of the five students planning on industry careers, there was also a major shift in their interests. At the start of the program none of the five industry students was interested in sustainability or agriculture, but at the end three stated

they have career goals such as "scientist working in food or agricultural sciences," "engineering position with renewable energy resources," or "a job in a renewable energy industry."

Students encountered many real-life issues that occur when teams must work together to accomplish a task. Some supplies were not available when promised, some original design features were not compatible with living fish or plants, or materials used in the design did not work as expected. For each problem, the group met with mentors to evaluate and choose modifications. Students had to work in groups with members from diverse backgrounds and had to learn to listen to potential issues or solutions from different perspectives. Likewise, students had very different personalities, and with such a tight timeline strong personalities created tensions that had to be talked through. To create a spirit of good communication we met almost every morning to discuss challenges of the previous day, plans for the day, adjustments that needed to be made, and responsibilities that had to be taken.

There is strong evidence that the program improved the students' confidence and ability to work as part of an interdisciplinary team. In response to a question about the item that would most stick with you, one student responded, "Cooperating with different disciplines." In response to general comments, one student said, "This program was an overall great experience, by collaborating with peers outside my discipline it allowed me to gain a new perspective"; another said, "It was a very good opportunity to collaborate with students and faculty that I otherwise would not have had." Of course, putting students in diverse, interdisciplinary teams can have its challenges. One student commented, "Make sure all participants have time to actually work on projects. Credit should not be given to those who made little to no effort to complete the project. Peer evaluations should be done." This is a challenge in mixed groups with an intense summer program, and the peer evaluations will be added next year.

One of our initial goals was to expose students to the reality and complexity of sustainability and urban agriculture. We hoped to expose

students to data related to climate change, biodiversity loss, population growth, and resource use, and to the potential role of technology in addressing these challenges. When asked about the impact of the program, the cohort from 2017 made the following comments:

“It opened my eyes about the state of the planet.”

“We have the power to change things for our communities. This program completely changed my viewpoints on environmental issues and convinced me that we have the power to change the world.”

“This program was a great opportunity to learn new techniques as well as have hands-on experience. While learning certain topics in class, we were able to apply what we learned to make our project more sustainable.”

“This program surpassed all my expectations. I came out with a completely different view of the world and changed the industry I would like to work for.”

“I loved this program very much. I learned a lot about sustainable practices and energy sources. The need for change in our current world is needed if we want to protect our environment and if we want to protect our environment and if more people learn about this, maybe something can happen sooner.”

Results: Impacts of a Hurricane

The end of August 2017 brought a hurricane and devastating floods to the region. The 2017 projects were completed in July. The original plan was to continue optimizing the aquaponic systems throughout the fall semester; all the student groups were encouraged to apply for Student Government Association funds to continue their work throughout the fall. All three groups were awarded some funds to do this. One month after completing the

systems, however, Hurricane Harvey swept through the UHD Sustainability Garden, dismantling the garden and destroying the aquaponic systems (Figure 3). A result of this flood will be a change in direction for the project. After students who have been impacted have found a safe place to live and the university reopens, we will work with our students to rebuild the aquaponics systems. Our preliminary plan is to build one central system using all the knowledge gained from building the



Figure 3. Photo of the UHD Sustainability Garden after it Was Ravaged by Hurricane Harvey

The storm destroyed the aquaponic systems and damaged other features of the garden.

individual systems. We will mentor this cohort of students through the chaos of the coming semester and engage them in discussions about the intersection of natural disasters and the creation of sustainable systems.

Discussion: Critical Elements for Building an Undergraduate Program in Urban Agriculture and Sustainability

Intense immersion of students in curricula from two classes, including a hands-on project and professional development activities, can be a powerful tool for student engagement in urban agriculture and sustainability, but also poses some challenges. Students in this program learned about the scope of issues in Fundamentals of Sustainability, and they problem-solved solutions in Renewable Energy Systems. Concepts were reinforced with the hands-on project of building a solar-powered aquaponics system. This intense summer program also included lunchtime review sessions and Friday guest speakers, allowing time to discuss and apply the content in a number of contexts. The intensity of such a program requires that the group meet at least once a day to discuss all aspects of the program including the status of supplies, communication between members, responsibilities of each group member, accomplishments for the day, and goals for the next day. Even with this focus on communication, there may be students who feel they are doing more work than others. Peer evaluation may help with this. The intensity of our program's design resulted in tired students and faculty by the end of the program. Stretching the program from half a summer to a whole summer may alleviate exhaustion, but the half-summer design allows students the flexibility to work before the fall semester or to take other courses that may be required for their degree. If we moved the program to an entire summer as is typical of other universities, we fear we would lose many of our urban students.

Cross-disciplinary programs can be challenging to establish but have a significant payoff. After working together on a previous collaborative project in sustainability, the two mentors of this program wrote a cross-disciplinary

USDA grant that received funding. The collaboration between biology and engineering technology is leading to additional creative ideas. It is likely that collaborations across numerous fields relevant to urban agriculture and sustainability would be just as productive. Those considering such a collaboration should not underestimate the initial time needed to align approaches in different disciplines. For example, the scientific method and engineering approach of design and optimization are distinct and must be reconciled. Engineering and science students (and faculty) speak different languages, and this creates challenges in working together. Working together can be slow initially and can complicate group dynamics, but participants ultimately reach a new level of communication and learning. We are confident this cross-disciplinary program will help students get more job interviews and give them advantages once they land jobs.

Mentoring a program of 10 students with two faculty members can be an effective method for impacting students. The intensity of the program was combined with as much mentoring as possible. We tried to listen to all students daily. We helped students directly with issues that came up, such as advising, financial aid, and plans after graduation. We created forums to learn about each other. This often occurred around food. Almost daily there was a shared breakfast, and faculty and students shared homemade dishes for Friday pot-luck lunches. The goal was to create an environment where students felt supported and inspired.

We have realized it is critical to think through some logistics of the program as it relates to facilities and staff and school policies. We learned there were many questions to consider before the design of the program. Is there a designated person or persons to help students order supplies and make sure they can be obtained fast enough for students to build projects over half a summer? Not only does said person need to be identified, but his or her boss must approve of the time required. Where will students work on the project? If the students will be building, what tools will they need? What safety training will they need to use these tools? Can the equipment be used without


annoying neighboring classes or setting off fire alarms? What is the required travel paperwork, and can it be done before the program starts? Finally, what funds can be used to support students when they engage in such a program? We are currently using funds from a USDA grant and are exploring ways to keep student stipends going using CUAS funds. It will be critical to have funds to run this program and provide stipends so that students can justify the time the program takes away from working.

We would advise prospective program organizers to be prepared for the unexpected. It is unlikely that others creating educational programs to promote urban agriculture and sustainability will be hit with a hurricane that floods their campus and wipes out the student projects that have just been completed. However, unexpected events may be an opportunity to model sustainability. How do we move forward and how do we learn from what has just happened? This particular disaster offers unique opportunities to discuss the role of climate change in large-scale natural disasters. What does the data say about connections between ocean temperature and hurricanes? If we embrace the narrative of sustainability that combines science, technology, and economics to create stable systems, how do we build resiliency into our systems? Our future course discussions will encourage students to consider the role resiliency will play in the design of food systems and our future cities. Resiliency to natural disasters will be a requirement for creating future sustainable systems.

References

- Cheruvilil, K. S., Soranno, P. A., Weathers, K. C., Hanson, P. C., Goring, S. J., Filstrup, C. T., & Read, E. K. (2014). Creating and maintaining high-performing collaborative research teams: The importance of diversity and interpersonal skills. *Frontiers in Ecology and the Environment*, 12(1), 31–38. <http://dx.doi.org/10.1890/130001>
- Clark, P. G. (2006). What would a theory of interprofessional education look like? Some suggestions for a theoretical framework for teamwork training. *Journal of Interprofessional Care*, 20(6), 577–589. <http://dx.doi.org/10.1080/13561820600916717>
- Federal Emergency Management Agency [FEMA]. (2017, September 1). Federal government continues response to Hurricane Harvey [Press release]. Retrieved from <https://www.fema.gov/news-release/2017/09/01/federal-government-continues-response-hurricane-harvey>
- Intergovernmental Panel on Climate Change [IPCC]. (2012). *Managing the risks of extreme events and disasters to advance climate change adaptation* (A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change) [Field, C. B., Barros, V., Stocker, T. F., Qin, D., Dokken, D. J., Ebi, K. L., ... Midgley, P. M. (Eds.)]. Cambridge, UK, and New York: Cambridge University Press. Retrieved from https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf

Conclusions

Reflections shared can assist others contemplating a summer program to teach urban agriculture and sustainability. At urban universities, students are rarely exposed to food production and sustainable technologies. An intense half-summer program with financial support allows students to justify their time spent in the program and can create an impactful experience. In the second year, we have made changes to combine curriculum, a hands-on project, and interdisciplinary student groups with professional development and mentoring. A hurricane at the end of our second summer reminds us that any educational program must be flexible. This particular disaster will be a mechanism for us to model resiliency with our students and will serve as a backdrop to discuss data and projections of climate change as it affects urban and agricultural systems. This hurricane that has devastated the Houston region is a stark reminder that any discussion of sustainability or sustainability plans must model resiliency for our changing planet. 

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- Jacobi, M. (1991). Mentoring and undergraduate academic success: A literature review. *Review of Educational Research*, 61(4), 505–532. <http://dx.doi.org/10.3102/00346543061004505>
- Hammer, L. B., Grigsby, T. D., & Woods, S. (1996). The conflicting demands of work, family, and school among students at an urban university. *The Journal of Psychology: Interdisciplinary and Applied*, 132(2), 220–226. <http://dx.doi.org/10.1080/00223989809599161>
- Klotz, L. (2016). *Sustainability through soccer: An unexpected approach to saving our world*. Oakland: University of California Press.
- Krajcik, J. S., & Blumenfeld, P. C. (2006). Project-based learning. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 317–333). New York: Cambridge University Press.
- Mejia, B. (2017, May 9). How Houston has become the most diverse place in America. *The Los Angeles Times*. Retrieved from <http://www.latimes.com/nation/la-na-houston-diversity-2017-htmlstory.html>
- Merchant, C. (2013). *Reinventing Eden: The fate of nature in western culture* (2nd Ed.). Abington, UK, and New York: Routledge.
- National Hurricane Center. (2017, August 29). Tropical Storm Harvey Discussion Number 36. Retrieved from <http://www.nhc.noaa.gov/archive/2017/al09/al092017.discus.036.shtml>
- Thayer, P. B. (2000). Retention of students from first generation and low income backgrounds. *Opportunity Outlook: The Journal of the Council for Opportunity in Education*. Retrieved from <http://files.eric.ed.gov/fulltext/ED446633.pdf>
- U.S. Department of Agriculture, Economic Research Service [USDA ERS]. (n.d.). *Food Access Research Atlas: Documentation*. Retrieved October 8, 2017, from <https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/>
- University of Houston–Downtown [UHD]. (2016). *About UHD: Mission and vision*. Retrieved September 2017 from <https://www.uhd.edu/about/Pages/about-mission.aspx>
- UHD. (2017). *About UHD: UHD quick facts*. Retrieved September 2017 from <https://www.uhd.edu/about/Pages/about-quickfacts.aspx>

Interdisciplinary food-related academic programs: A 2015 snapshot of the United States landscape

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Abstract

Interdisciplinary food-related research and study is a growing field in academia. Each year, more universities add departments, courses, majors, and minors focused on studying food and society and the complexities of growing, processing, distributing, accessing, and consuming food. In this commentary, we present our exploratory findings about interdisciplinary food-related academic programs, including food studies and food systems programs in the United States. This cross-sectional research developed a snapshot of the 2015 landscape of interdisciplinary food-related academic

programs, provided a preliminary examination of their educational offerings, and will inform future research opportunities. In this formative study, we found 82 interdisciplinary food-related undergraduate programs focused on food. Nineteen program majors, minors, or concentrations had a core disciplinary focus on sustainable agriculture. “Food studies” and “food systems” were the primary focus of 15 undergraduate programs. We found 58 interdisciplinary food-related graduate programs and extracted information on their course offerings. Organizing courses into nine course categories, 78 percent of the programs offered courses in two to five categories, and 22 percent offered courses in six to eight categories. Few courses integrated material from multiple disciplines into a single course, suggesting that these interdisciplinary programs stemmed from

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traditional academic silos. Based on this preliminary work, we propose to further investigate the interdisciplinary nature of food-related academic programs, map their growth trajectory, and solicit feedback from faculty and administrators about their challenges in establishing and maintaining these programs. In future research, we are also interested in exploring job options for graduates of food-related academic programs to inform recruitment strategies and courses of study.

Keywords

Academic Programs; Agriculture; Food Studies; Food Systems; Higher Education; Nutrition; Sustainability; United States; Universities

Introduction

Interdisciplinary food-related research and study is a growing field in academia. Each year, the number of universities with departments, courses, majors, and minors focused on studying food and its relationship to culture and society, and the complexities of growing, processing, distributing, accessing, and consuming food, increases (Holt, 2015; Jacobsen et al., 2012; Spiegel, 2012; Weissman, Gantner, & Narine, 2012). This development has been motivated by student desire to learn interdisciplinary approaches to studying food (Holt, 2015; Jacobsen et al., 2012; Spiegel, 2012).

Traditionally, food-related programs have been housed in a single department or school and organized into such fields as Agricultural Science, Food Science, Nutrition Science and Dietetics, and Culinary Arts and Hospitality. Some programs function within their historic missions as land-grant universities that were established in the 1860s to teach applied agricultural subjects (Jacobsen et al., 2012; Spiegel, 2012). In contrast, the modern wave of interdisciplinary food-related programs in higher education—"Food Studies" programs—draw from humanities, social sciences, and natural sciences, following in the footsteps of interdisciplinary programs such as Women's Studies and American Studies that employ multiple academic sectors to solve complex social and political challenges (Berg, Nestle, & Bentley, 2003; Cargill, 2005).

The impetus to develop many of these interdisciplinary food-related academic programs stems

from a growing awareness of the relationship between food choices and their impact on local and global issues such as climate change, environmental sustainability, public health, water shortages, and animal rights and welfare (McIntyre, Herren, Wakhungu, & Watson, 2009; Neff, 2014; Neff, Merrigan, & Wallinga, 2015; Pretty et al., 2010; Tomich et al., 2011; Whitmee et al., 2015). As the world population grows, develops, and globalizes, there is an increasing strain on the finite land, water, and energy resources used in the food system (Godfray et al., 2010). Single disciplines are limited in their capacity to address these changing demands on the food supply. One approach to conceptualize these multifaceted issues is to apply systems theory to food systems issues (Sobal, Khan, & Bisogni, 1998). Systems theory takes a big-picture approach to studying the various inter-related components of a system, including cycles, chains, and webs (Sobal et al., 1998). This method, referred to as a "food systems approach," often draws on methods from multiple disciplines to solve complex food system issues. These problems include how to produce an adequate caloric intake, reduce the prevalence of access and distribution challenges, and assure the environmental sustainability for future generations. Some food systems approaches focus on methods within a discipline, while interdisciplinary food systems approaches break down traditional academic silos and teach systems-level methods to problem solving across two or more academic fields.

The first programs in the United States to address interdisciplinary food-related studies and research began in the 1990s at New York University (NYU) and Boston University (BU). Building on an academic program established in the 1920s, NYU currently has a Department of Nutrition, Food Studies, and Public Health in its Steinhardt School of Culture, Education, and Human Development. Initiated by the politically engaged nutritionist Marion Nestle, this department has undergraduate, graduate, and doctoral degree programs in Food Studies in the fields of Nutrition and Dietetics, Food Studies, Food and Restaurant Management, and Public Health (Berg et al., 2003; Nestle & McIntosh, 2010). Renowned chefs Julia Child and Jacques Pépin cofounded Boston Uni-

versity's Gastronomy program, which now allows students to choose from multiple focus areas for a Gastronomy master's degree or earn a graduate certificate in Food Studies (Boston University, n.d.). Since these early programs, numerous universities have developed and launched food studies programs, with a boom over the past decade.

To increase our understanding of the growing field of interdisciplinary food-related academic programs such as Food Studies, Food Systems, and Sustainable Agriculture, our exploratory research goal was to provide a strong foundation for further, more comprehensive research. In this research commentary, we offer a snapshot of the landscape of interdisciplinary food-related academic programs in the U.S. and their educational offerings. We welcome the involvement of representatives of any of these programs in future research.

Methods

We used a multipronged approach to identify interdisciplinary undergraduate and graduate food-related academic research and study programs in the U.S., including degree and certificate-conferring online programs. To identify interdisciplinary food-related academic programs, we established two criteria. First, the program had to publicly market itself in program descriptions as providing interdisciplinary coursework, and/or listings of the coursework had to be in two or more disciplines that address food-related issues. Second, the program had to be a formal academic program of an accredited public or private educational institution that awarded degrees and/or certificates.

For undergraduate programs, we included programs where students could major, minor, or have a concentration in food-related research and study. We excluded community college programs, any programs outside the U.S., and programs that were not yet enrolling students by December 2015 to simplify and focus our research. For graduate programs, we included master's, doctoral degree, or certificate programs.

With these criteria established, we reviewed lists of food and agriculture academic programs compiled by colleagues from the University of California (UC) at Berkeley, Davis, and Santa Cruz.

During this stage, we also reviewed food studies and food systems program lists from the Association for the Study of Food and Society, the Sustainable Agriculture Education Association, and the Inter-Institutional Network for Food, Agriculture and Sustainability.¹ The programs gathered in this step were then analyzed to determine if they met our inclusion criteria. At this stage, 49 undergraduate programs and 39 graduate programs were identified.

To supplement this initial list, we performed an internet search using Google during February and March 2015 using the search terms "food studies undergraduate programs" and "food systems undergraduate programs," or "food studies graduate programs" and "food systems graduate programs." From the programs identified by the internet search terms, we reviewed the program description and course listings, if available, to confirm that the program was interdisciplinary. In this stage, an additional 23 undergraduate programs and six graduate programs were identified.

Finally, in fall 2015, we shared our aggregated list with food studies and food systems colleagues to confirm that we had identified known programs, leading to the addition of 10 undergraduate programs and 13 graduate programs.

Once an interdisciplinary food-related academic program was confirmed, we collected the following information: the department(s) and/or school(s) involved, degree awarded, program address and URL, program contact, details on an associated farm or garden program, and when the program was established. We reviewed course listings for undergraduate food-related academic programs when available, but chose not to catalog them as it was not always clear if the courses listed

¹ The food studies and food systems program lists were obtained at these sites:

- Association for the Study of Food and Society: <http://www.food-culture.org/food-studies-programs/>
- Sustainable Agriculture Education Association: <http://www.sustainableaged.org/projects/degree-programs/>
- Inter-Institutional Network for Food, Agriculture and Sustainability: <http://asi.ucdavis.edu/programs>

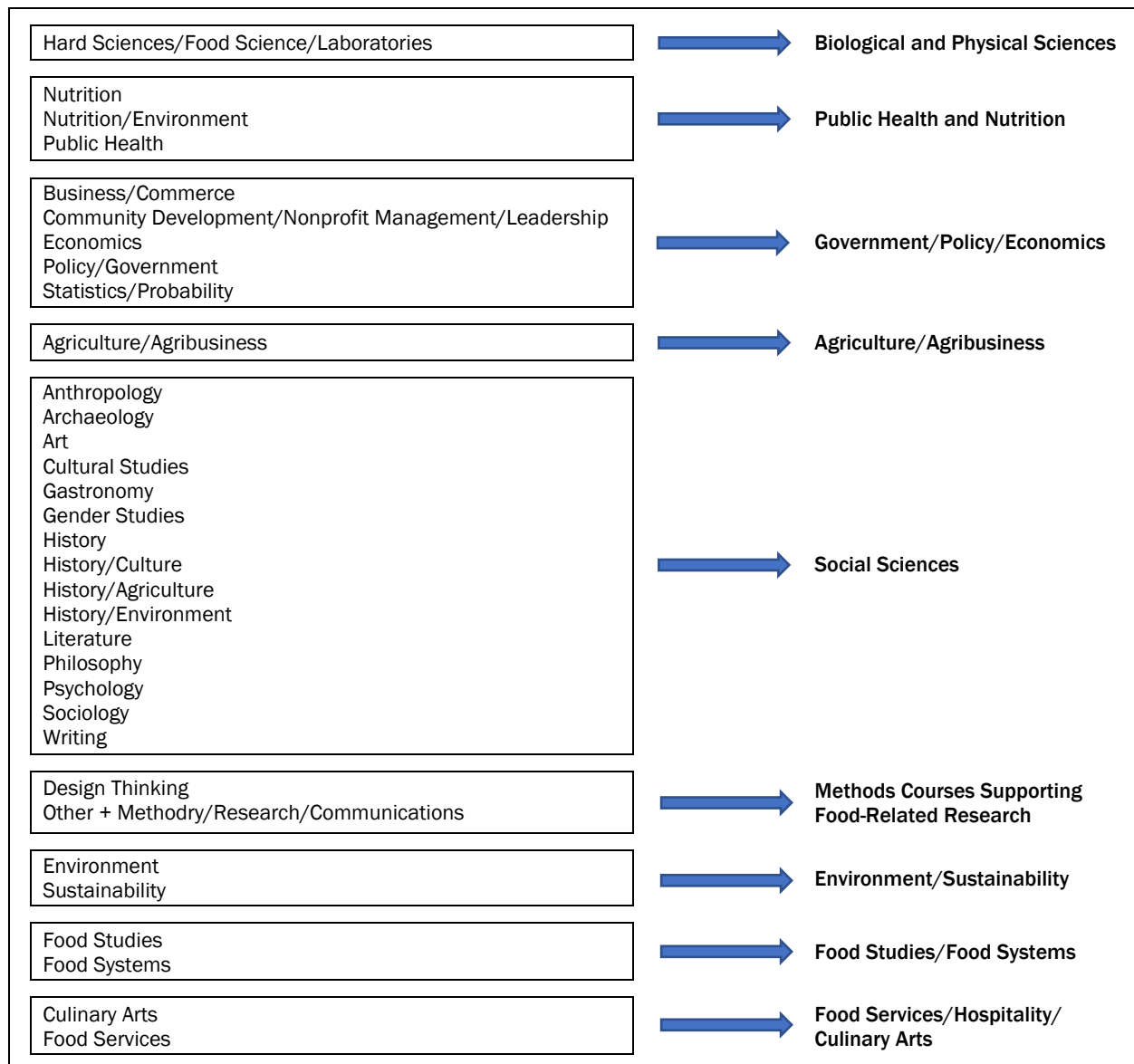
Note that the sites have been updated since this study, so their current lists will not match the lists in this article.

were necessary to fulfill school-wide or degree requirements.

For interdisciplinary graduate food-related academic programs, we obtained the required course listings. Our initial course categories were not developed *a priori*; instead, we developed course categories as we reviewed course listings. First, we distinguished “food studies” and “food systems” courses. Food studies described courses with a focus on cultural, historical, or other academic perspectives on food. For example, a food studies course might examine the importance of

grains throughout the world, or issues around hormones in meat production. We defined food systems courses as those that either explicitly used “food systems” in the title or description, or contained subject matter that included a broader examination of the inputs to food production, distribution, and consumption. Their content tended to focus on examinations of current issues in the food system. We found considerable overlap between “food studies” and “food systems” courses, so we combined these categories in our final course groupings.

Figure 1. Categorization Process for Interdisciplinary Food-Related Courses



We also distinguished between “food science” and “food services” courses. Food science courses are focused on the chemical and biological characteristics of food and are more lab- and natural science-intensive, such as Food Chemistry and Food Microbiology Laboratory. Food services courses, such as Marketing and Purchasing, focus on the food-service industry through an economic, business, logistics, or managerial lens.

By aggregating offerings from similar disciplines, the original 33 course categories collapsed into an organizational structure that resulted in a final set of nine categories (see Figure 1). The course categories include (in order of prevalence): biological and physical sciences (including food sciences courses); public health and nutrition; government, policy, and/or economics; agriculture and agribusiness; social sciences; methods courses supporting food-related research; environment and sustainability; food studies and food systems; and food services, hospitality, and/or culinary arts.

Results

Presented below is information we compiled about interdisciplinary food-related academic degree programs in the United States, organized into undergraduate programs and graduate programs.

Undergraduate Programs Identified

We identified 83 undergraduate interdisciplinary food-related academic programs offered at 63 universities. The majority of these programs had their core focus in food production, with specializations in agricultural technology, sustainable agriculture, agroecology, horticultural science, plant science, soil science, crop science, and organic farming. We found 19 programs that focused on sustainable agriculture, eight programs self-described as “food systems programs,” and seven programs with a “food studies” focus. Six of the programs were interdisciplinary environmental studies programs tied to sustainable agriculture or sustainable farming. There were 21 programs centered on nutrition and the preparation of food, including nutrition science, dietetics, culinary science, culinary arts, and food science. Four programs included a focus on the economic basis of the food system, including

agricultural economics; food business economics; and economics related to development, sustainability, and the environment; and one food security degree. Cultural aspects of food are explored in such majors as gastronomy; eco-gastronomy; and food, place, and culture (see Appendix A).

Graduate Programs Identified

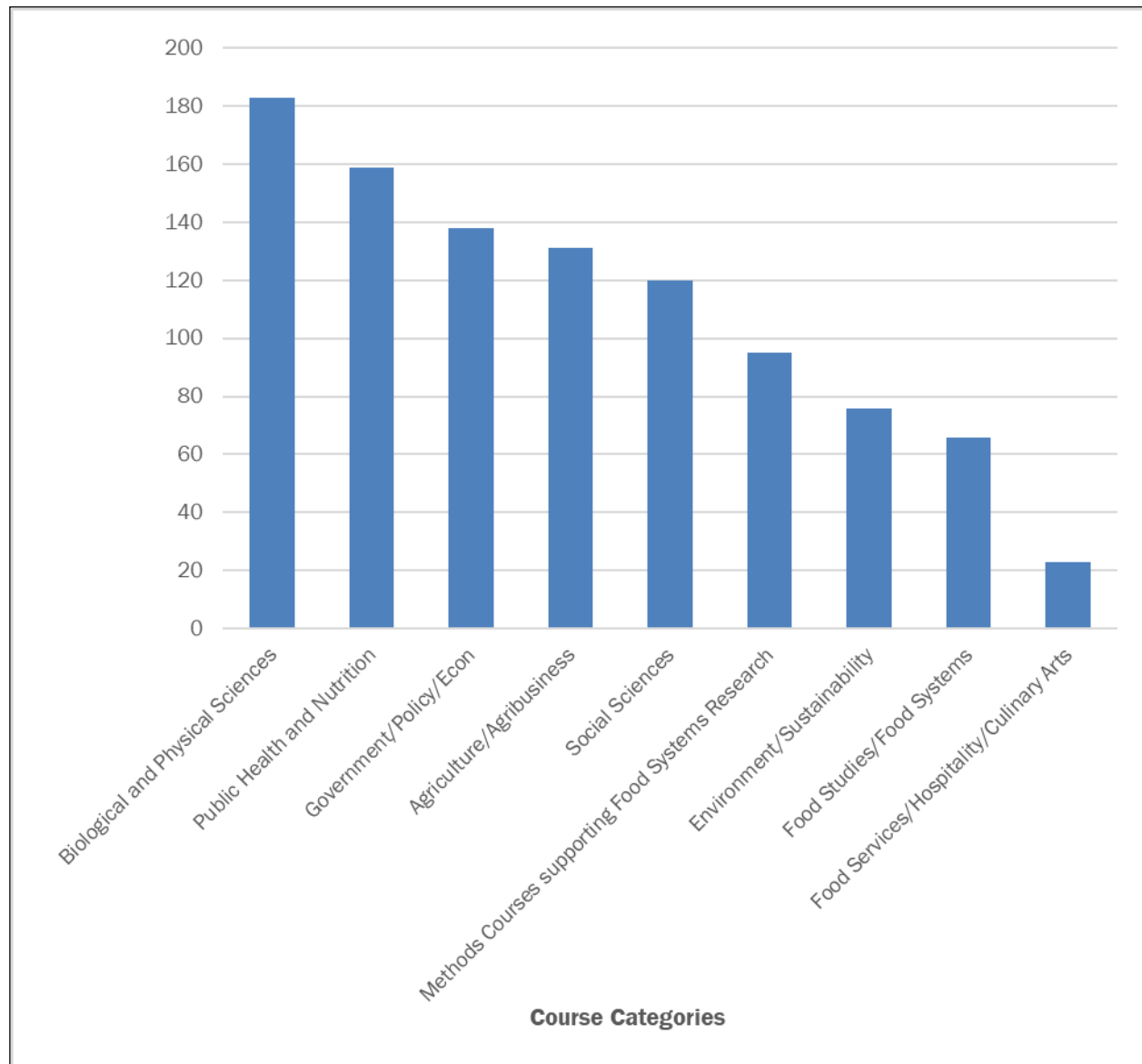
We identified 58 graduate interdisciplinary food-related academic programs housed at 42 universities, with a full listing of these graduate programs in Appendix B. Of the 58 graduate interdisciplinary programs, 55 (95%) provided online resources about their programs and course listings. After reviewing course listings for all 55 programs, the totals for each course category were calculated. We found that there were 991 courses in all that we organized into nine categories.

The most prevalent graduate school courses, as displayed in Figure 2, were in the biological and physical sciences ($n=183$), usually in support of food science research. The second highest course category was in public health and nutrition ($n=159$), followed by government, policy, and economics ($n=138$). Food Studies and Food Systems courses ($n=66$) were eighth in prevalence. In order to assess the interdisciplinary nature of these food programs, we evaluated how many different course categories each program’s classes belonged to. Within the nine course categories, 78 percent (43 of 55) of the programs offered courses in two to five categories, and 22 percent (12 of 55) offered courses in six to eight categories.

The interdisciplinary food-related academic program field is dynamic. While preparing this commentary for publication, we found that since our research was completed in 2015, more programs had emerged and some programs had been put on hold. We anticipate that the landscape has continued to change and that emergent programs will be identified and included in future research efforts.

Discussion

This exploratory research was undertaken to develop a snapshot of the interdisciplinary food-

Figure 2. Interdisciplinary Food-Related Academic Graduate Program Courses by Category

related academic programs in the United States to inform future investigations on the breadth of this growing field of research and study. We combined the practical knowledge our colleagues had of established food-related academic programs with a systematic online search for programs that met our eligibility criteria.

While we found many interdisciplinary food-related academic programs, our research yielded few truly interdisciplinary courses. Among graduate programs, we observed that many food

studies and food systems programs, although offering courses in multiple disciplines, were primarily focused in one area of study. Instead of designing courses that included multiple disciplines into one course, there was a tendency to design programs where the multifaceted knowledge about food was acquired by students taking separate courses in a variety of disciplines. We believe that this course and program design may be due to the fact that many food studies and food systems programs originated in single

disciplinary settings and are still growing into the field of interdisciplinary work. There is also the challenge of cost-effective methods to teach interdisciplinary courses, with issues such as funding faculty from single-discipline fields to co-teach an interdisciplinary course, finding funding for full-time faculty, and hiring faculty trained and specializing in interdisciplinary work. Another explanation for this single-discipline structure stems from historical underpinnings. For instance, single disciplines sometimes have established themselves as the lead food-related authority in an institution and may approach collaboration with another discipline cautiously (Weissman et al., 2012). The addition of interdisciplinary food studies and food systems programs can also create conflict because this new discipline may be competing for the same sources of funding as the established single-discipline departments. For example, an agroecology program may compete for agriculture or environmental funding.


A limitation of our study was that it was a cross-sectional assessment of available interdisciplinary food-related academic programs. Our main search methods were to contact academic food studies and food systems experts and to search for programs using online resources. Schools and/or programs that were not well known, were newly established, or did not have an internet presence at the time of our data-gathering may not have been captured with these methods. In the future, it could prove beneficial to administer a survey to all existing programs with questions that could aid in characterizing their programs. A census could gather program details to give a more complete picture of the past, current, and future directions of the emerging field of food-related academic programs. In future research, more specific data should be asked regarding the age and stage of the program, the number of currently enrolled students, the number of graduates, the jobs that program graduates attain, and a more detailed course analysis (possibly even course syllabi). By learning more about these programs, we could develop typologies of food-related academic programs to expand or refine our current findings on interdisciplinary program types such as food studies, food systems, agroecology, and ecogastronomy. In addition, open-ended

questions and select interviews could reveal details about the challenges of establishing and maintaining a program, including defining the program's niche or brand, the vision for the program, current opportunities, and prospective opportunities for collaboration.

Conclusions

The research presented here is a snapshot of the interdisciplinary food-related academic programs landscape that is emerging at universities across the country. Our preliminary findings reveal that many schools continue to focus their course offerings in traditional academic strengths, and this may indicate a need or opportunity to expand more interdisciplinary course offerings.

Metrics need to be developed for the emerging field of food-related academic programs that evaluate their curricula as well as the job attainment of graduates. Possible directions include developing metrics to assess in which fields students find employment, and determining if training prepares students for previously existing jobs exclusively or for new types of jobs and career paths. These data could be obtained through a survey of program graduates and could yield valuable information to accelerate the development of programs that better fulfill the needs of current and future students.

The widespread presence of interdisciplinary food-related academic programs in the U.S. identified in this formative study appears to have emerged fairly recently. These programs are likely developing in response to a growing sense of need to address what appears to be multiple social, environmental, and economic failings of the current food system. We hope that these academic programs will provide the pipeline of intellectual and human resources needed to solve these complex, interdisciplinary food-related problems. 

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References

- Berg, J., Nestle, M., & Bentley, A. (2003). Food Studies. In S. H. Katz & W. W. Weaver (Eds.), *Encyclopedia of Food and Culture*. New York: Charles Scribners & Sons.
- Boston University. (n.d.). *Gastronomy programs*. Retrieved from <http://www.bu.edu/met/subject/gastronomy/>
- Cargill, K. (2005). Food studies in the curriculum: A model for interdisciplinary pedagogy. *Food, Culture & Society*, 8(1), 115–123. <https://doi.org/10.2752/155280105778055371>
- Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., . . . Toulmin, C. (2010). Food security: The challenge of feeding 9 billion people. *Science*, 327(5967), 812–818. <http://dx.doi.org/10.1126/science.1185383>
- Holt, S. (2015, September 22). Majoring in food: Colleges offering more courses, degrees [Blog post]. *Civil Eats*. Retrieved from <https://civileats.com/2015/09/22/majoring-in-food-colleges-offering-more-courses-degrees/>
- Jacobsen, K. L., Niewolny, K. L., Schroeder-Moreno, M. S., Van Horn, M., Harmon, A. H., Chen Fanslow, Y. H., . . . Parr, D. (2012). Sustainable agriculture undergraduate degree programs: A land-grant university mission. *Journal of Agriculture, Food Systems, and Community Development*, 2(3), 13–26. <http://dx.doi.org/10.5304/jafscd.2012.023.004>
- McIntyre, B. D., Herren, H. R., Wakhungu, J., & Watson, R. T. E. (2009). *Agriculture at a crossroads: The global report*. Washington, D.C.: International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD).
- Neff, R. (Ed.). (2014). *Introduction to the U.S. food system: Public health, environment, and equity*. San Francisco: Jossey-Bass.
- Neff, R. A., Merrigan, K., & Wallinga, D. (2015). A food systems approach to healthy food and agriculture policy. *Health Affairs*, 34(11), 1908–1915. <http://dx.doi.org/10.1377/hlthaff.2015.0926>
- Nestle, M., & McIntosh, W. A. (2010). Writing the food studies movement. *Food, Culture & Society*, 13(2), 159–179. <http://dx.doi.org/10.2752/175174410X12633934462999>
- Pretty, J., Sutherland, W. J., Ashby, J., Auburn, J., Baulcombe, D., Bell, M., . . . Pilgrim, S. (2010). The top 100 questions of importance to the future of global agriculture. *International Journal of Agricultural Sustainability*, 8(4), 219–236. <http://dx.doi.org/10.3763/ijas.2010.0534>
- Sobal, J., Khan, L. K., & Bisogni, C. (1998). A conceptual model of the food and nutrition system. *Social Science & Medicine*, 47(7), 853–863. [https://doi.org/10.1016/S0277-9536\(98\)00104-X](https://doi.org/10.1016/S0277-9536(98)00104-X)
- Spiegel, J. E. (2012, April 13). Truly food for thought. *The New York Times*. Retrieved from <http://www.nytimes.com/2012/04/15/education/edlife/truly-food-for-thought.html>
- Tomich, T. P., Brodt, S., Ferris, H., Galt, R., Horwath, W. R., Kebreab, E., . . . Yang, L. (2011). Agroecology: A review from a global-change perspective. *Annual Review of Environment and Resources*, 36(1), 193–222. <http://dx.doi.org/10.1146/annurev-environ-012110-121302>
- Weissman, E., Gantner, L., & Narine, L. (2012). Building a food studies program: On-the-ground reflections from Syracuse University. *Journal of Agriculture, Food Systems, and Community Development*, 2(3), 79–89. <http://dx.doi.org/10.5304/jafscd.2012.023.010>
- Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., . . . Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation- *Lancet* Commission on planetary health. *The Lancet*, 386(10007), 1973–2028. [http://dx.doi.org/10.1016/S0140-6736\(15\)60901-1](http://dx.doi.org/10.1016/S0140-6736(15)60901-1)

Appendix A. Undergraduate Food-related Academic Programs: 2015 Snapshot

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
Appalachian State University	Program of Sustainable Development	Sustainable Development (BS) - Agroecology and Sustainable Agriculture Concentration	BS ^a concentration
California State Polytechnic University, San Luis Obispo	Department of Food Science and Nutrition	Nutrition	BS
	College of Agriculture, Food and Environmental Sciences (CAFES), Center for Sustainability	Sustainable Agriculture	Minor
California State University, Stanislaus	College of the Arts, Humanities, and Social Sciences; Department of Agricultural Studies	Agricultural Studies, Permaculture	BS
Clemson University	College of Agriculture, Forestry, and Life Sciences; School of Food, Nutrition, and Packaging Sciences	Food Science; Packaging Science	BS
	College of Entomology, Soil, and Plant Sciences	Soils and Sustainable Crop Systems	BS
College of the Atlantic	None specified	Farming and Food Systems	BS
Culinary Institute of America	New York Campus	Applied Food Studies	BPS ^b
City University New York, Hunter College	School of Urban Public Health	Nutrition and Food Science	BS
Delaware Valley College	Department of Plant Science	Sustainable Agriculture Systems	BS
Evergreen State College	None specified	Food, Health, and Sustainability	BA ^c or BS
		Food, Place, and Culture	BA or BS
		Practice of Sustainable Agriculture	BA or BS
Ferrum College	School of Natural Sciences and Mathematics, Department of Agricultural Sciences	Agriculture with emphasis in Agroecology	BS emphasis area
Fort Lewis College	School of Natural and Behavioral Sciences, Department of Biology and Agriculture	Agroecology/Sustainable Agriculture	Minor
George Mason University	College of Health and Human Services	Global and Community Health, Nutrition Concentration	BS
Georgia Southern University	College of Health and Human Sciences	Nutrition and Food Science	BS
Green Mountain College	None specified	Sustainable Agriculture and Food Production	BA
Kentucky State University	College of Agriculture, Food Science, and Sustainable Systems	Agriculture, Food, and Environment	BS
Le Cordon Bleu of Culinary Arts (USA) (online)	Le Cordon Bleu	Culinary Arts/ Pâtisserie and Baking Program/Hospitality & Restaurant Management Program/Culinary Management Online	BA/Associates

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
Lipscomb University	College of Leadership and Public Service: Institute for Sustainable Practice	Environmental and Sustainability Science, focus on Agroecology	BA
	Department of Nutrition	Food Systems Management	BS
Loyola University Chicago	Institute of Environmental Sustainability	Environmental Science: Food Systems and Sustainable Agriculture	BS
Michigan State University	Department of Food Science and Human Nutrition, College of Agriculture and Natural Resources	Food Science and Human Nutrition	BS
	College of Agriculture and Natural Resources, Department of Plant, Soil, and Microbial Sciences	Sustainable Agriculture and Food Systems	Minor
Montana State University	Colleges of Agriculture and Education, Health and Human Development	Sustainable Food and Bioenergy Systems	BS
Montclair State University	College of Education and Human Services; Department of Nutrition and Food Science	Nutrition and Food Science with a concentration in Food Systems	BS
Morningside College	Regina Roth Applied Agricultural and Food Studies	Applied Agricultural and Food Studies	BA, BS, minor
New School for Public Engagement	The New School For Public Engagement	Food Studies	BA or BS
North Carolina State University	Department of Crop Science	Crop science with concentrations in: Agroecology, Agronomic Business, Agronomic Science, Crop Biotechnology, Crop Production	BS
	Department of Soil Science	Soil Science	BS
The New School	Schools for Public Engagement	Food Studies	BA or BS
New York University	Steinhardt School of Culture, Education, and Human Development; Department of Nutrition, Food Studies, and Public Health	Food Studies	BS
		Nutrition and Dietetics	BS
Ohio State University	College of Food, Agricultural, and Environmental Sciences	Environment, Economy, Development, and Sustainability	BS and minor
Pennsylvania State University	College of Agricultural Sciences, Plant Science	Plant Sciences	BS
Prescott College	None specified	Environmental Studies and Sustainability-Agroecology	BS
Purdue University	College of Agriculture, Department of Food Science	Food Science	BS
		Culinary Science	BS
Ramapo College of New Jersey	School of Social Science and Human Services	Food Studies	Minor

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
Rutgers	Department of Food Science, School of Environmental and Biological Science	Food Science	BS
Stanford University	School of Earth, Energy, and Environmental Sciences; Earth Systems Program	Sustainable Food and Agriculture Track	BS track
Sterling College	Sterling College	Sustainable Food Systems	BA
Syracuse University	Department of Public Health, Food Studies, and Nutrition	Nutrition	BS
		Nutrition Science	BS
		Food Studies	BS
University of California, Berkeley	College of Natural Resources (CNR), Department of Environmental Science, Policy & Management (ESPM)	Food Systems Minor	Minor
University of California, Davis	Agricultural Sustainability Institute	Sustainable Agriculture and Food Systems	BS
	Department of Agricultural and Resources Economics	Agricultural Economics	BS
	College of Agricultural and Environmental Sciences, Department of Food Science and Technology	Food Science	BS
University of California, Santa Cruz	College of Environmental Studies	Environmental Studies, Agroecology and Sustainable Agriculture Emphasis	BS
Unity College	The Center for Sustainability and Global Change	Sustainable Agriculture	BS
University of Florida	Horticultural Sciences Department	Horticultural Science	BS and minor
University of Georgia	College of Agricultural and Environmental Science, Department of Food Science and Technology	Food Science and Technology	BS
University of Hawaii, West O'ahu	Bachelor of Applied Sciences Programs	Sustainable Community Food Systems Concentration	BAS ^d concentration
University of Kentucky	College of Agriculture, Food, and Environment	Sustainable Agriculture	BS and minor
University of Maine	Departments of Plant, Soil and Environmental Sciences, Biology, and Resource Economics and Policy; Sustainable Agriculture Program	Sustainable Agriculture	BS
University of Massachusetts, Amherst	Stockbridge School of Agriculture	Sustainable Food and Farming	BS
University of Michigan	College of Literature, Science and Arts	Sustainability Food Systems Minor	Minor
University of Minnesota	Institute for Sustainable Agriculture	Sustainable Agricultural Systems	Minor
University of Missouri	College of Agriculture, Food, and Natural Resources; Department of Agriculture	Sustainable Agriculture	BS and minor

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
University of Montana	College of Humanities and Sciences, Environmental Studies Department	Environmental Studies, Sustainable Food and Farming Emphasis	BA emphasis
University of New Hampshire	Dual Degree in EcoGastronomy	EcoGastronomy	Dual Degree
	Sustainable Agriculture and Food Systems	Sustainable Agriculture and Food Systems	BS, BA
The University of Southern Mississippi	Department of Nutrition and Food Systems	Nutrition Science	BS
		Nutrition and Dietetics	BS
University of Tennessee	Institute for Agriculture, Department of Plant Sciences	Organic Production	BS concentration
University of Vermont	Plant and Soil Science	Ecological Agriculture	BS and minor
	Food Systems Initiative	Food Systems Minor	Minor
University of Washington	School of Public Health, Nutritional Sciences Program	Nutritional Sciences	Minor
University of Wisconsin, Madison	Department of Food Science	Food Science	BS
University of Wisconsin, Stout	Food Science and Technology Program	Food Science and Technology	BS
University of Wyoming	Department of Plant Sciences and Ecosystems Science and Management	Agroecology	BS and minor
Virginia Polytechnic Institute and State University	Departments of Horticulture; Agricultural, Leadership, and Community Education; Human Nutrition, Foods, and Exercise; Agriculture and Life Sciences; Animal and Poultry Sciences; Crop and Soil Environmental Sciences; Plant Pathology, Physiology, and Weed Science	Civic Agriculture and Food Systems	Minor
Warren Wilson College	Department of Environmental Studies	Environmental Studies with emphasis on Sustainable Agriculture	BA, BS concentration
Washington State University	College of Agricultural, Human, and Natural Resource Sciences	Organic Agricultural Systems	BS
		Agricultural Technology and Production Management	BS
		Agricultural Education	BS
		Agricultural and Food Business Economics	BS
		Agricultural and Food Security	BS
Western Washington University	Fairhaven College of Interdisciplinary Studies	Self-Designed Concentration in Sustainable Agriculture	BA concentration
Xavier University (in Ohio)	Land, Agriculture, and Community	Land, Farming, and Community	BA

^a Bachelor of Science; ^b Bachelor of Professional Studies; ^c Bachelor of Arts; ^d Bachelor of Applied Sciences

Appendix B. Graduate Food-related Academic Programs: 2015 Snapshot

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
Boston University	Metropolitan College	Gastronomy	MLA ^a
		Food Studies	Certificate
Chatham University	Falk School of Sustainability	Food Studies	MA ^b
College of the Atlantic	None specified	Sustainable Food Systems	MPhil ^c
George Mason University	College of Health and Human Services; Department of Nutrition and Food Studies, Department of Geography and Geoinformation Science	Food Security	Certificate
	Not specified	Sustainable Food Systems	MS ^d
Indiana State University	College of Health and Human Services, Department of Applied Health Sciences	Public Health Nutrition	MS Concentration
Indiana University, Bloomington	Departments of Anthropology, Archeology, Political Science, Nutrition, Biology, Geography, Comparative Literature	Anthropology of Food	PhD ^e
Iowa State University	Sustainable Agriculture	Sustainable Agriculture	MS, PhD
Johns Hopkins University	Bloomberg School of Public Health	Food System, Environment and Public Health	Certificate
Kansas State University	Urban Food Systems; Horticulture, Forestry, and Recreation	Horticulture with an emphasis in Food Systems	MS
Kentucky State University	College of Agriculture, Food Science, and Sustainable Systems	Environmental Studies	MS
Marylhurst College (Online with some on-campus courses)	Department of Food Systems and Society	Food Systems and Society	MS
Michigan State University	Plant, Soil and Microbial Sciences	Ecological Food & Farming Systems	MS, PhD
	Department of Agricultural, Food, and Resource Economics	Agricultural, Food, and Resource Economics	MS, PhD, Dual Degrees
Montana State University	Department of Health and Human Development	Food, Family, and Community Health Sciences Option; Sustainable Food Systems Program	MS
New Mexico State University	Anthropology	Food Studies	MA Minor
New York University	Steinhardt School of Culture, Education, and Human Development; The Department of Nutrition, Food Studies, and Public Health	Food Studies, Global Public Health/Nutrition and Dietetics, Global Public Health/Food Studies, Nutrition	MS, PhD
North Dakota State University	Agribusiness and Applied Economics	Agribusiness and Applied Economics	MS
	Plant Sciences, Veterinary and Microbiological Sciences, and Agricultural and Biosystems Engineering	Cereal Sciences	MS, PhD

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
	School of Natural Resource Sciences; Departments of Entomology, Environmental and Conservation Sciences, and Natural Resources Management	Entomology	MS, PhD
	Agribusiness and Applied Economics	International Agribusiness	MS
	School of Food Systems; faculty participants from the Colleges of Agriculture, Food Systems, and Natural Resources; Arts, Humanities, and Social Sciences; Engineering and Architecture; Human Development and Education; and Science and Mathematics	International Infectious Disease Management and Biosecurity	MS, PhD
	Plant Pathology	Plant Pathology	MS, PhD
	Plant Sciences	Plant Sciences	MS, PhD
	Agriculture, Food Systems, and Natural Resources; Arts, Humanities and Social Sciences; Engineering and Architecture; Human Development and Education; and Science and Math	Food Safety	MS, PhD
	Agricultural and Biosystems Engineering	Agriculture and Biosystems Engineering	MS, PhD
Ohio State University	Environmental Science Graduate Program with faculty from Colleges of Biological Sciences; Engineering; Food, Agricultural, and Environmental Sciences; Mathematical and Physical Sciences; Medicine; Social and Behavioral Sciences; and Veterinary Medicine	Environmental Science, Agrosystems Science Graduate Specialization	MS, PhD
Rutgers	Food Sciences	Food Science	MS, PhD
Santa Clara University	Leavey School of Business, Food and Agribusiness Institute	Food and Agribusiness Concentration	MBA Concentration
Syracuse University	Nutrition Science and Dietetics	Nutrition Science	MA or MS
Texas A & M University	The Departments of Soil & Crop Sciences, Agricultural Economics, Veterinary Pathobiology, and Veterinary Physiology & Pharmacology	Regulatory Science in Food Systems	Certificate
Texas Women's University	Nutrition & Food Sciences	Food Science	MS
		Food Systems Administration	MS
Tufts University (Online)	Friedman School of Nutrition Science and Policy	Sustainable Agriculture and Food Systems	Certificate
University of California, Berkeley	School of Public Health	Public Health Nutrition	MPH ^f
	College of Natural Resources	Environmental Science, Policy, and Management	PhD
University of California, Davis	Food Science and Technology	Food Science	MS, PhD

Institution Name	School/Department/Programs Involved	Degree Name	Degree Awarded
University of California, Santa Cruz	Environmental Studies Department	Environmental Studies with a focus on Agroecology and Sustainable Agriculture	PhD
University of Massachusetts	College of Natural Sciences	Sustainability Science with a focus on Sustainably Food Systems and Agriculture	MS
University of Michigan	School of Natural Resources and Environment	Sustainable Systems, Food Systems Theme	MS
University of Minnesota	Minnesota Institute for Sustainable Agriculture	Sustainable Agricultural Systems	Minor for MS, MA & PhD
		Food Science and Nutrition	MS, PhD
University of Missouri	Food Science College of Agriculture, Food and Natural Resources	Food Science	MS, PhD
University of Missouri (Online)	Center for Agroforestry	Agroforestry	MS
University of Montana	College of Humanities and Sciences	Environmental Studies, Sustainable Food and Farming Emphasis	MS emphasis
University of North Carolina, Chapel Hill	Department of Anthropology	Food, Environment, and Sustainability	Concentration
University of North Texas School of Public Health	School of Public Health	Certificate in Food Security and Public Health	Certificate
University of Oregon	College of Arts and Sciences, Environmental Studies Program	Food Studies	Specialization
University of the Pacific	College of the Pacific	Food Studies	MA
		Food Systems Graduate Program	MS
		Animal, Nutrition, and Food Science	PhD
University of Rhode Island	College of the Environment and Life Sciences	Biological and Environmental Systems, Specialization in Sustainable Agriculture and Food Systems	MS, PhD Specialization
The University of Southern Mississippi	College of Health; Department of Nutrition & Food Systems	Nutrition and Food Systems	MS
University of Vermont	Nutrition and Food Sciences Department	Nutrition and Food Studies	MS
University of Wisconsin-Madison	College of Agricultural and Life Sciences	Agroecology	MS
University of Wisconsin-Stevens Point	School of Health Promotion and Human Development	Sustainable and Resilient Food Systems	MS
Washington State University	College of Agricultural, Human, and Natural Resource Sciences; Department of Horticulture	Agriculture	MS

^a Master of Liberal Arts; ^b Master of Arts; ^c Master of Philosophy; ^d Master of Science; ^e Doctor of Philosophy; ^f Master of Public Health

Bridging crop diversity and market development in the Northeast grain renaissance

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Abstract

The local food movement has grown significantly over the past several years, producing and marketing fresh fruits and vegetables, and meat and dairy. Recently there has been a push in the Northeastern U.S. to grow small grains, primarily high-protein wheat varieties for baking bread and for malting barley for brewing and distilling, for local and regional markets. University researchers, nonprofit organizations, and government institutions are supporting this advance in the regional food system by working with farmers to increase production of these crops and develop markets for their sale. This paper argues that these farming systems, starting with the early stages of

field crop production work, should include diverse crop rotations that will provide farmers with multiple revenue streams, improve soil quality, and reduce the incidence and severity of pest outbreaks. Consumers in the existing and developing regional grain market will benefit from increased availability of fresh, flavorful, and healthy grains, beans, and oilseeds. The paper draws connections between the farming, research, and market-development communities that are working toward improved farm biodiversity.

Keywords

Collaboration; Development; Diversity; Field Crops; Grain; Markets; Regional; Resilience; Rotation

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Henry Blair works for GrowNYC's Greenmarket Regional Grains Project, a nonprofit organization that operates in this field. The program may be eligible for grants or other funding for outcomes discussed in this paper.

Introduction

Since the 1970s, the local and regional food movement has grown significantly, with evidence of the shift abundant on multiple fronts. Thus, it is not uncommon today for consumers to inquire about the origins of food and demand transparency. Food companies label products as “natural,” “local,” “family farm,” and so forth to offer clarity to their customers. Municipalities are investing in urban agriculture programs, states are promoting food hubs and local labels, such as Colorado Proud, NY Grown and Certified, Made in Montana, and PA Preferred, and the federal government is investing as well in organic agriculture and crop diversification (Low et al., 2015). At the farm level, farms marketing directly to consumers increased 17 percent from 2002 to 2012, and farmers markets increased 180 percent between 2006 and 2014 (Low et al., 2015). Such changes have resulted in robust farm production for local markets, as farmers produced US\$8.6 billion worth of edible products sold in local markets in 2015 (U.S. Department of Agriculture, National Agricultural Statistics Service [USDA NASS], 2016).

Until recently, much of the local food attention has focused on fresh fruit, vegetable, meat, and dairy production, leaving field crops largely out of the discussion. For good reasons, local and regional food advocates have turned their attention to grain production to increase the diversity of locally and regionally produced foods. Grains make up a significant portion of diets, suggesting that a ready market exists. Furthermore, ancient and heritage grains, the types most compatible with local and regional food systems, offer rich genetic diversity, which is compelling to farmers seeking stress tolerance and adaptability.

Nationally, four of the ten top states producing for local markets are in the Northeast¹: Massachusetts (MA), New York (NY), Pennsylvania (PA), and Vermont (VT) (USDA NASS, 2016). Furthering this strong regional interest in local production, Northeast farmers have been working directly with millers, maltsters, bakers, and brewers for grain variety selection and production feedback. Once

appropriate varieties are identified, selection and crossing for modern wheats follow. The ancient and heritage grains suitable for the regional climate are varieties once readily found in the Northeast when farms were more diversified, before the nationalization of agriculture. Ancient and heritage wheats have greater genetic diversity and offer traits with more resistance to pest and disease pressure, and sometimes are more resilient to drought and excess moisture. Selecting and crossing ancient and heritage varieties produces hardier and more resilient crops for the Northeast (Rogosa, 2012). Rebuilding the regional system for grains from the early stages of cultivation presents an opportunity to implement diverse and ecologically sound production models.

Targeting regional markets for the reestablishment of grain production involves selecting varieties for flavor, preserving the identity and integrity of products and producers, and relieving the negative social and environmental damage created by intensive monocrop agriculture (Cornell University, 2017; Rogosa, 2016). Markets available to regionally grown small grains and rotation crops include home cooks and bakers, brewers and distillers, restaurants and bakeries, institutions such as schools and hospitals, livestock farms, biofuel companies, and food processors. Ancient and heritage grains especially pique the interests of chefs and bakers, who seek out their complex flavor profiles for higher quality end-products (Cornell, 2017). These markets have begun to open for grain growers in the Northeast and may be further expanded as production increases.

Actively fostering environmental qualities, such as biodiversity and soil quality, is an important component of thoughtfully developing a regional market for grains. Crop rotation is a crucial aspect, as farms are healthier systems when grains are grown in sequence with other crops, such as dry beans, oilseeds, and forages. Crop rotation, biodiversity, and soil conservation have been identified as key elements of sustainable farm management (Kirschenmann, 2010). Diverse crop rotations have many benefits for the farm ecosystem.

Rhode Island, New York, Pennsylvania, and New Jersey.

¹ The nine states that make up the Northeast are Maine, Vermont, New Hampshire, Massachusetts, Connecticut,

These systems cycle and make available macro- and micronutrients in the soil, add organic matter to the soil to improve aeration and granulation, increase both water-holding capacity and drainage, disrupt pest cycles, provide additional revenue streams in the event of crop failure, promote beneficial microbial, insect and wildlife habitat, and slow soil erosion (Kirschenmann, 2010; Kroeck, 2011; Lazor, 2013; Lengnick, 2015; Rogosa, 2016).

To effectively promote crop biodiversity on the farm, it is important to build markets for various rotation crops. It is less compelling for farmers to dedicate time, energy, and land to harvests that are unmarketable. Input costs are high for grain farms: cultivation, harvest, and cleaning and storage equipment are expensive to purchase and maintain. The supply of clean, high-quality seed for field crops is low in the Northeast, and prices are often high, especially for heritage grains and heirloom beans. Seed saved on farms or from unknown sources may be contaminated with disease and weed seed (Lazor, 2013). It is difficult to make the case to farmers to grow crops which require additional resources, such as time and handling space, and which then may not be sold (Rogosa, 2012).

Based on the relevant literature and several years of experience working and studying in the field, we make a case for active market development for rotation crops so that farmland in field crop production is improved, farmers can adopt systems for profitable crop diversity, new businesses that use various field crops can emerge and grow, and consumers are able to buy a greater variety of local farm products.

History of Grain Production in the Northeast

In the mid- to late-19th century, technological advances in farm and food processing, widespread construction of canals and railroads, and new breeding techniques to select for high-yielding spring-sown wheat varieties drew grain production from the Northeast to the Midwestern states (Cronon, 1991; Lazor, 2013; Rogosa, 2016). Landscapes in the west were vast and transportation became cheap. The development of the grain reaper and combine in the 1830s, the grain elevator in the 1840s, and the roller mill in the 1870s

allowed for significant economies of scale in grain production, storage, processing, and transportation to take hold over the course of the century (Cronon, 1991; Jacob, 2007). Farmers in the Midwest produced ever larger quantities of grain, seed companies and food processors expanded, and field crop production became fully industrialized and specialized (Cronon, 1991; Jacob, 2007; Kroeck, 2011). Food processing and manufacturing increased across the country into the 19th century. These efficiencies made it possible for fewer farmers to produce greater quantities of food.

While the Midwest expanded these technologies to increase production, the Northeast struggled to compete. Markets for Northeastern wheat expanded during the Civil War, and farmers planted it continuously for several years. Lack of crop rotation, however, mined soils of nutrients over time and increased pest pressure. Outbreaks of Hessian fly and black stem rust, and degraded soils, combined with the inability to compete with Midwestern farmers, convinced farmers in New York to discontinue grain production and either shift to and specialize in more perishable goods, such as dairy and fresh vegetables, or forgo farming altogether (Kroeck, 2011; Lengnick, 2015).

The departure of Northeast grain farms rippled through the region. Throughout the 20th century, mills, malt houses, breweries, and distilleries in the Northeast shut down (Platel & Russell, 2015). During this time, advances in farming, food processing, and transportation technologies continued, allowing for increased yield and production efficiency with less human labor in the supply chain. Knowledge of grain husbandry and value-adding in the region became more fragmented and attenuated over the course of the 20th century. Existing grain cultivation and handling equipment fell into disrepair and most new machinery was designed for the massive-scale farms in the Great Plains. Though breweries and distilleries remained in New York through the 19th century and into the 20th, they quickly closed during Prohibition. Grain elevators across the region remained vacant, mills were abandoned and destroyed, and midscale processing became non-existent (Platel & Russell, 2015). Market forces and technological development, combined with inadequate cropping systems

and poor land stewardship, led to the collapse of the Northeast grains economy.

This reflects broader changes in the agricultural sector. Between 1910 and 1970, U.S. agricultural output nearly doubled, while farm acreage decreased; farm labor decreased 54 percent from 1950 to 1972, while labor productivity quadrupled and total farm output increased 55 percent (Heady, 1976). As crops became standardized on large Midwestern farms, grains lost their specificity and traceability. At the same time, due to standardizing commodities for baking and distilling, baked goods and spirits lost their local character and, consequently, consumers became further removed from food production (Halloran, 2015).

Despite this collapse of regional infrastructure, some farmers continued to produce crops, mainly rye, oats, corn, and buckwheat, for the emerging dairy industry (Platel & Russell, 2015). The back-to-the-land movement of the 1970s exhumed some of the old knowledge and slowly brought back grain farming and milling on a small scale. Many of these farmers and processors continue to be highly valuable resources for the development of robust and resilient regional grain and field crop production. They produce various crops for growing markets and are valuable mentors to new growers.

Current and Developing Regional Grain Markets

The Northeastern grains movement has grown significantly since 2009. The impact of the revival is visible in every sector of the supply chain, which is developing as more farms grow grains for regional markets and as mills and malt houses are built to process grain. The intermediaries—breweries, distilleries, bakeries, and restaurants—are seeking sources of regional grain products for the growing consumer demand. Support structures, such as extension and testing services, are developing expertise and best practices for grain cultivation and quality analysis. (Kucek et al., 2017). A great deal of literature is being produced about local and regional grain systems for farm stewardship and concerns such as environmental health, human health, local food systems, and flavor (Bland, 2013; Halloran, 2015; Koenig, 2010; Mars, 2015; Razon, 2017; Rogosa, 2016; Sen, 2015). Because grain

needs to be carefully tested, cleaned, and processed before coming to market, institutional support and policy levers are activating across the region.

Northeast communities have engaged with grain growers and processors to strengthen their economies. Since 2010 this kind of work has been occurring in central and northern Maine, led by the Maine Grain Alliance (MGA) and the Somerset Gristmill. MGA formed with a mission to increase grain production in Maine for the economic benefit of farmers, support of the local economy, and provision of high quality, local food for consumers (MGA, n.d.). The Somerset Gristmill acts as a liaison between growers and consumers, judging grain baking quality, testing for disease, and developing markets. The availability of local grain has led to the growth of malt houses, breweries and bakeries, and related tourism in the area.

Many other organizations in the Northeast are having a similar impact. In Vermont, the Northern Grain Growers Association (NGGA) formed in 2004 to support existing regional grain growers and encourage expansion. The group engages various stakeholders across the region to share research and best practices for grain production and processing (NGGA, n.d.). The Organic Growers' Research and Information-Sharing Network (OGRIN) began in New York to conduct on-farm research of organic production practices. It has acted as a liaison between the research and farming communities, providing valuable insight into the development of sustainable, regional organic farming (OGRIN, 2017). Heritage Grain Conservancy (HGC), a farmer-owned research program in Massachusetts, researches and shares best production practices for ancient and heritage wheats that exhibit strong potential for Northeast production (HGC, n.d.). The HGC also offers seed and planting guidelines for regional farmers. The Northeast Organic Farming Association (NOFA) chapters in Massachusetts and New York have also hosted workshops, field days, and lectures to showcase growing practices and offer market assistance to Northeast organic farmers interested in grain production (NOFA/Mass, 2014).

Technical assistance is becoming more readily available to growers through extension services offered by the land-grant university system.

Pennsylvania State University (PSU) offers a webinar outlining organic grain quality indicators and information about the production of high-quality organic heritage wheat (PSU, 2013). Cornell offers advice for growing high-quality specialty small grains and has a robust small grains breeding program (O'Dea, 2013). The University of Vermont (UVM) supports grain and dry bean growers in the state, with a lab for quality analysis (UVM Extension, 2017).

It is vital for sustainable growth of a regional grain system to include development of substantial markets for the critical rotation crops. Despite all that the research and farming communities know about the health of complex rotation systems and ecologically balanced farming methods, the need for economic viability is often a deciding factor for increasing crop diversity. It is important to recall the practices and events of the 19th century, when resources were treated as unlimited and markets for a select few specific crops were insatiable: crop loss and systems collapse ensued.

The Greenmarket Regional Grains project has been developing the market for food grains in New York City since 2004. First, the project began conducting supply chain and market outreach and education. In 2009, Greenmarket adopted a rule requiring the use of local flour in all baked goods sold at over 50 Greenmarkets across the city. In 2014, the program grew to include the Grainstand, a retail booth for education, outreach, and sales of grains and flours at target markets (GrowNYC, 2016). Local flour can now be found in many shops, grocery stores, and bakeries across the city, and the mill businesses have grown tremendously. This is just one market locale of many across the Northeast, from Pennsylvania to Maine. Farms and mills in the region have been supplying restaurants and bakeries with local, fresh flour for several years. Retail sale of these products, to home cooks and bakers, has been increasing as well.

Multiple other markets exist for grain products, however, including craft beverages, animal feed, and biodiesel fuel. The craft beverage industry has been growing for several years across the Northeast. In 2012, New York State passed legislation to encourage brewery and distillery business development, creating farm brewery, distillery, and

cider production licenses that require the use of New York agricultural products. Farm brewers and distillers must use 20 percent New York ingredients, to increase to 60 percent in 2019 and 90 percent in 2024 (New York State Governor's Office, 2013). Since 2005, there has been an increase of 278 breweries—130 of which are farm breweries—and 124 distilleries in New York, with an estimated economic impact of US\$27 billion since 2012 (Empire State Development, 2017). The requirements for grain use paired with the growing demand for craft beer and spirits in New York markets signal a significant need to increase food- and beverage-grade grain production in New York State. Though these breweries and distilleries are reliant in large part on malting barley, there is growing interest in alternative grains such as wheat, rye, corn, and buckwheat as competition in the marketplace demands more interesting and unique flavor profiles.

Though New York State has passed the most aggressive legislation in support of these businesses, which has led to increased grain production in the state, other states are seeing growth in this sector as well. Vermont passed legislation in 1988 to allow for the operation of brewpubs, permitting the sale of beer in the same location it is brewed. Vermont is a leader in microbrewery and craft beer production; currently, the state has 51 craft breweries in operation, the highest number of breweries per capita in the nation (Vermont Brewers Association, 2017; Vermont Pub & Brewery, 2014). In 2014, craft breweries in Vermont had over US\$199 million in economic activity, supporting over 1,500 jobs (Kavet, Rockler & Associates, LL, 2015). Maine currently has 82 breweries that employ over 1,600 people and that had an economic impact of over US\$221 million in 2016. Output has increased 25 percent since 2013, and the state is expecting a 39 percent increase in 2018 and 41 percent by 2020 (Crawley & Welsh, 2017).

The impact of the Northeast grains system reaches several layers of the regional economy. Malthouses returned to the Northeast with the 2009 launch of Valley Malt in Hadley, MA. Since then over a dozen malt businesses and hundreds of breweries and distilleries have sprung up. There are currently 14 malt houses in New York, while 10

years ago there were none in the entire Northeast (Cazentre, 2017). In the last 10 years, at least four commercial flour mills started in the Northeast, and several more existing mills became reinvigorated with the availability of and demand for local flour. These businesses continue to create jobs, purchase crops from local and regional farms, support regional distributors, engage regional research institutions, and promote agricultural and food and beverage tourism.

Dairy and livestock farmers, recognizing consumer demand for organic and local products, are increasingly seeking certified organic grain for feed. Perhaps because they have access to land and equipment, some have begun turning part of their own fields over to grain production to produce their own feed (Lazor, 2013). This is a market opportunity for growers whose grain falls below beverage- and food-grade quality standards; beginning growers who are concerned with missing quality targets for beverage and food markets may find interested livestock farmers. This is especially attractive to transitional or organic growers who may experience quality disruptions. Additionally, by-product from food, beverage, and fuel grains, such as hulls, straw, bran, spent grain, and pellets from crushed oilseed are viable products for livestock feed. Animal feed is a market opportunity for

forage crops that can be grown in rotation with food and beverage grains.

Rotation Crops for Northeast Grain Farms

Systems that incorporate crop rotation, when compared to monocropping systems, support soil health and farm level agro-ecology (Gliessman, 2016). The primary barriers to instituting these practices now are production capability and underdeveloped market demand. Existing farms may be more willing to incorporate increased crop diversity if there are demonstrated markets for the harvested product. The increased number of grain farms in the Northeast offers an opportunity for diverse products from field crop systems. Rotation offers various benefits for farmers, including multiple revenue streams in the event of crop loss, pest habitat disruption, and increased soil health. Rotation is an especially important practice for organic growers, who are prohibited from using synthetic fertilizers and pesticides. Having a range of crops offers consumers multiple products and product varieties for their specific needs.

Table 1 provides examples of rotation crops that perform well on Northeast farms. These crops include a variety of plant families that interact with soil, pests, and diseases in different ways. The crops have different root structures, nutrient needs

Table 1. Rotation Crops Suitable to the Northeast

Crop	End Use	Plant family	Benefits
Dry Beans	Food, feed	<i>Fabaceae</i>	Fixes atmospheric nitrogen
Buckwheat	Food	<i>Polygonaceae</i>	Fine root structure, soil granulation, phosphorous extraction, rapid growth
Sunflower	Food, oil	<i>Asteraceae</i>	Deep taproot
Canola	Food, oil	<i>Brassicaceae</i>	Cold tolerant
Corn	Food, feed	<i>Poaceae</i>	
Wheat	Food, feed	<i>Poaceae</i>	High value
Oats	Food, feed	<i>Poaceae</i>	
Emmer	Food	<i>Poaceae</i>	Drought and pest tolerant, high value
Rye	Food, feed	<i>Poaceae</i>	Grows on poor soil, cold tolerant, winter cover
Mustard Seed	Food, oil	<i>Brassicaceae</i>	
Flax	Food, oil, fiber	<i>Linaceae</i>	High value

Sources: Kroeck, 2011; Lazor, 2013; Rogosa, 2016.

and recycling ability, and marketability. These provide multiple benefits to farmers by increasing soil organic matter—thereby increasing water-holding capacity and decreasing fertilizer requirements—protecting against total crop loss, generating multiple revenue streams, and increasing the potential for long-term farm resiliency (Kroeck, 2011).

Legumes are grown in rotation with grains to replenish nutrients back into the soil by transferring atmospheric nitrogen into the soil. This process makes nitrogen, essential for plant growth, available for the following year's crop, thus reducing the need for synthetic fertilizers. In addition, legumes interfere with many pest and disease cycles that become common when a field is left in a single crop year after year. By alternating between leguminous crops and grasses (grain crops), pest and disease loss is often lessened. Expanding rotation to include a greater variety of crops increases resiliency even further (Kroeck, 2011; Lazor, 2013; Lengnick, 2015).

Common legume crops in the region are black beans, kidney beans, clover, and alfalfa. Combine-ready peas and beans in the Northeast offer large-scale farms the capacity to grow legumes in rotation with grains and offer institutional buyers the option for more standardized ingredients in larger volumes. Higher-value legumes offer increased revenue for farmers and access to more interesting and better-tasting products for consumers. Heirloom beans command higher prices in specialty markets across the region. Challenges for specialty beans, however, include a clean seed supply and delicate post-harvest handling procedure (Gifford, 2015; Lazor, 2013).

Recognizing the need for rotation, some businesses, such as Vermont Bean Crafters, have begun to focus on rotation crops to increase environmental and food system sustainability. The company began in 2010 with the goal of increasing production of staple crops in Vermont and enhancing farm diversity. It coordinates with over a dozen growers in Vermont and New York to produce and process up to a thousand pounds (454 kg) of dry beans per week (Gifford, 2015). Vermont Bean Crafters also produces several value-added products, such as bean burgers, that

are sold to institutions such as hospitals and care facilities, the University of Vermont food services, and Vermont school food programs. These products replace commodity products with items produced from crops that economically and ecologically benefit regional farms (Carter, 2013; Gifford, 2015).

Oilseeds, such as sunflower, canola, and flax, may be better suited to larger-scale production than the region currently provides. Nevertheless, these crops, as they belong to different families with different growth stages and root structures than grasses and legumes, are beneficial additions to crop rotations. The harvested crops may be used in the form of whole seed for human or livestock consumption, pressed for culinary oil, and pressed and refined for biodiesel. Waste product produced by pressing for oil can also be sold as livestock feed. These processes may be done by outside enterprises or, depending on the scale involved, performed on the farm itself, providing lucrative value-added products for farmers. More research is needed to evaluate and identify varieties of other oilseed crops such as flax and pumpkin suitable for field crop systems.

Discussion and Conclusions

There is an important distinction between understanding the importance of crop rotation and having the resources and market opportunity to increase farm diversity through crop rotation. Structural and social support are essential elements for more widespread adoption of diversity-promoting farm management practices (Kirschenmann, 2010). Farmers are generally aware of the benefits of crop rotation for soil health and pest resistance, as researchers have been investigating and promoting crop rotation for many years and numerous programs and organizations are gaining a better understanding of these processes and interactions. However, market development for a wide range of crops is critical for making a substantive transition to diverse systems. Local and sustainable food systems professionals are needed to engage and develop markets for rotation crops as a means of encouraging the adoption of diverse cropping systems

The markets for high-quality bread wheat and

malting barley have been demonstrated, following years of research and commitment by various organizations and businesses. Attention must remain fixed on the overall goals of agro-ecological stewardship and farm resilience, in order to establish financial independence for farmers in the face of increased food system consolidation and the effects of climate change. Policy and economic incentives, such as the New York Craft Act, Vermont microbrewery laws, farm-to-institution programs, Greenmarket's 15 percent flour rule and the Greenmarket Regional Grains Project, and research and grant work provided and supported by NGGA, OGRIN, NOFA/Mass, Cornell University, UVM, Penn State, MGA, Sustainable Agriculture Research and Education (SARE), and others have significantly affected development of the re-established Northeast grains industry. With collaboration from diverse stakeholders, more work can be accomplished to engage markets, increase demand for diverse crops, and increase farm revenue and overall resiliency. Ideally, stakeholders and advocates for sustainable regional food systems would work with bakers, chefs, brewers, distillers, livestock producers, millers, and

grain farmers to further develop demand for legumes, oilseeds, ancient grains, forages, and other rotation crops.

There are several areas for further study and engagement. Technical assistance is needed for developing diverse crop systems on regional farms. The availability of equipment to handle various grains and field crops on the farm and throughout the supply chain is deficient in the Northeast and is a limiting factor for system expansion. Institutional support—from local and state departments of agriculture, food policy, and economic development—is needed to promote and encourage multiple-crops and farm conservation practices for resilient farming to become more widespread in the region. Education and outreach programs focusing on intermediary buyers and end-point consumers are needed to grow the marketplace for a greater diversity of field crops. Feedback mechanisms between farmers, processors, handlers, and consumers can be studied, strengthened, and formalized to increase efficiencies in sharing best practices, specifications, and needs throughout the supply chain.

References

- Bland, A. (2013, June 25). Going against the grain: Small-scale grain farms are the next wave of the locavore movement. But can they actually make a profit? *Slate*. Retrieved from http://www.slate.com/articles/life/food/2013/06/small_scale_grain_farmers_can_local_grains_be_profitable.html
- Carter, R. (2013, July 1). Locally grown beans in the college cafeteria: Vermont's Farm to Plate Network offers farmer and producer examples of navigating the regional supply food chain to serve 'local' at institutions. *Cornell Small Farms Program Quarterly*. Ithaca, NY: Cornell Cooperative Extension, Cornell Small Farms Program. Retrieved from <http://smallfarms.cornell.edu/2013/07/01/locally-grown-beans-in-the-college-cafeteria/>
- Cazentre, D. (2017, September 21). 1886 Malt: Upstate NY's big new brewery supplier could be game-changer [Online newsgroup]. Syracuse, NY: Advance Media New York. Retrieved from http://www.newyorkupstate.com/breweries/2017/09/1886_malt_upstate_nys_big_new_brewery_supplier_could_be_a_game-changer.html
- O'Dea, J.. (2013). *Some resources on growing small grains in the Northeast*. Kingston, NY: Cornell University Cooperative Extension-Ulster County. Retrieved from <http://www.hort.cornell.edu/expo/proceedings/2016/Hops%20and%20Grains.%20The%20Cornell%20malt%20barley%20update.pdf>
- Cornell University. (2017, July 20). Heritage and ancient grain project feeds a growing demand. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2017/07/170720103129.htm
- Crawley, A., & Welsh, S. (2017). *The economic impact of the craft brewing industry in Maine* (Staff Paper SOE-630). Orono: University of Maine, School of Economics.
- Cronon, W. (1991). *Nature's metropolis: Chicago and the Great West*. New York: W. W. Norton.
- Empire State Development [ESD]. (2017). *The case for building your craft beverage business in New York State—distilled*. Albany: NYS Government, ESD. Retrieved from <https://esd.ny.gov/industries/craft-beverage>

- Gifford, A. (2015, Summer). Putting beans in the center of the plate. *Quarterly Newsletter of the Northeast Organic Farming Association of Vermont*. Richmond: NOFA-VT. Retrieved from https://nofavt.org/sites/default/files/files/resources/nofanotes_summer2015.pdf
- Gliessman, S. (2016). Transforming food systems with agroecology. *Agroecology and Sustainable Food Systems*, 40(3), 187–189. <https://doi.org/10.1080/21683565.2015.1130765>
- GrowNYC. (2016). About Greenmarket's Regional Grains Project. New York: GrowNYC. Retrieved from <https://www.grownyc.org/grains/about>
- Halloran, A. (2015). *The new bread basket: How the new crop of grain growers, plant breeders, millers, maltsters, bakers, brewers, and local food activists are redefining our daily loaf*. White River Junction, VT: Chelsea Green.
- Heady, E. O. (1976). The agriculture of the U. S. *Scientific American*, 235(3), 106–127. <https://doi.org/10.1038/scientificamerican0976-106>
- Heritage Grain Conservancy [HGC]. (n.d.). Heritage Grain Conservancy: Restoring the cuisine of forgotten grains. Colrain, MA: Author. Retrieved from <http://growseed.org/About%20HGC.pdf>
- Jacob, H. E. (2007). *Six thousand years of bread: Its holy and unholy history*. New York: Skyhorse.
- Kavet, Rockler & Associates, LLC. (2015). *The economic impact of craft brewing on the Vermont economy in 2014*. Belmont, MA: Kavet, Rockler & Associates, LLC. Retrieved from [http://legislature.vermont.gov/assets/Documents/2018/WorkGroups/Senate/Economic Development/Vermont Brewers Association/W~Sean Lawson~Economic Study - VT Brewers Assoc.~1-11-2017.pdf](http://legislature.vermont.gov/assets/Documents/2018/WorkGroups/Senate/Economic%20Development/Vermont%20Brewers%20Association/W~Sean%20Lawson~Economic%20Study%20-%20VT%20Brewers%20Assoc.%20~1-11-2017.pdf)
- Kirschenmann, F. L. (2010). *Cultivating an ecological conscience: Essays from a farmer philosopher*. Berkeley, California: Counterpoint Press.
- Koenig, L. (2010, March 22). The breadbasket of America: New England? *The Atlantic*. Retrieved from <https://www.theatlantic.com/health/archive/2010/03/the-breadbasket-of-america-new-england/37830/>
- Kroeck, S. (2011). *Crop rotation and cover cropping: Soil resiliency and health on the organic farm*. White River Junction, Vermont: Chelsea Green.
- Kucek, L. K., Dyck, E., Russell, J., Clark, L., Hamelman, J., Burns-Leader, S., ... Dawson, J. C. (2017). Evaluation of wheat and emmer varieties for artisanal baking, pasta making, and sensory quality. *Journal of Cereal Science*, 74, 19–27. <https://doi.org/10.1016/j.jcs.2016.12.010>
- Lazor, J. (2013). *The organic grain grower: Small-scale, holistic grain production for the home and market producer*. White River Junction, Vermont: Chelsea Green.
- Lengnick, L. (2015). *Resilient agriculture: Cultivating food systems for a changing climate*. Gabriola Island, British Columbia, Canada: New Society.
- Low, S., Adalja, A., Beaulieu, E., Key, N., Martinez, S., Melton, A., ... Jablonski, B. (2015). *Trends in U.S. local and regional food systems: Report to Congress* (Administrative Publication No. 068). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/42805/51173_ap068.pdf?v=42083
- Maine Grains Alliance [MGA]. (n.d.). History. Skowhegan, Maine: Maine Grains Alliance. Retrieved September 17, 2017, from <http://kneadingconference.com/history/>
- Mars, M. M. (2015). The framing and celebration of the American local grain movement [Review of the book *The New Bread Basket: How the New Crop of Grain Growers, Plant Breeders, Millers, Maltsters, Bakers, Brewers, and Local Food Activists Are Redefining our Daily Loaf*, by A. Halloran]. *Journal of Agriculture, Food Systems, and Community Development*, 6(1), 209–211. <https://doi.org/10.5304/jafscd.2015.061.002>
- New York State Governor's Office. (2013, October 9). *Governor Cuomo welcomes 14 licensed farm breweries in New York State* [Press Release]. Albany: NYS State Capitol Building. Retrieved from <https://www.governor.ny.gov/news/governor-cuomo-welcomes-14-licensed-farm-breweries-new-york-state>
- Northeast Organic Farming Association-Massachusetts Chapter [NOFA/Mass]. (2014). Growing grain in Massachusetts. Barre, Massachusetts: NOFA/Mass. Retrieved from <https://www.nofamass.org/events/growing-grains-massachusetts>
- Northern Grain Growers Association [NGGA]. (n.d.). Our association. St. Albans, Vermont: NGGA. Retrieved from <http://northerngraingrowers.org/our-association>

- Organic Growers' Research and Information Sharing Network [OGRIN]. (2017). About. Bainbridge, New York: OGRIN. Retrieved from <http://www.ogrin.org/about>
- Pennsylvania State University [PSU]. (2013, February 14). Management for high-quality organic wheat and ancient grain production in the Northeast [Webinar]. eXtension.org. Retrieved from <http://articles.extension.org/pages/66869/management-for-high-quality-organic-wheat-and-ancient-grain-production-in-the-northeast>
- Platel, R., & Russell, J. (2015). *Meeting the demand for small grains in New York State* [White paper]. Rensselaerville, New York: Carey Institute for Global Good and New York Empire State Development.
- Razon, K. (2017). *A guide to Northeast grains* (Master's thesis, Green Mountain College, Poultney, Vermont). Retrieved from <https://www.amazon.com/Guide-Northeast-Grains-Kristina-Razon-ebook/dp/B06W5DLKTV>
- Rogosa, E. (2012). *Northeast organic wheat; an extension program for on-farm crop improvement in organic systems and local market partnerships* (Final Report No. LNE08-270). College Park, Maryland: Sustainable Agriculture Research & Education. Retrieved from <https://projects.sare.org/project-reports/lne08-270/>
- Rogosa, E. (2016). *Restoring heritage grains: The culture, biodiversity, resilience, and cuisine of ancient wheats*. White River Junction, Vermont: Chelsea Green.
- Sen, I. (2015, September 15). Against the grain: With local farms growing wheat, will New York revive its appetite for local grain? *Edible Hudson Valley*, Fall 2015. Retrieved from <http://ediblehudsonvalley.ediblecommunities.com/food-thought/against-grain>
- University of Vermont [UVM] Extension. (2017). Northwest crops and soils program. Burlington, Vermont: University of Vermont Extension. Retrieved September 17, 2017, from <http://www.uvm.edu/extension/cropsoil/>
- U.S. Department of Agriculture [USDA]. (2015). *Dietary guidelines 2015-2020, Appendix 3: Healthy U. S.-style eating pattern*. Washington, D.C.: USDA, Center for Nutrition Policy and Promotion. Retrieved from <https://health.gov/dietaryguidelines/2015/guidelines/appendix-3/>
- USDA, National Agriculture Statistics Service [USDA NASS]. (2016). Total direct marketed sales of food and number of farms selling directly. Washington, D.C.: USDA NASS. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Local_Food/
- Vermont Brewers Association. (2017). Economic impact. Burlington, Vermont: Author. Retrieved September 17, 2017, from <https://www.vermontbrewers.com/about/economic-impact/>
- Vermont Pub & Brewery. (2014). History. Burlington, Vermont: Vermont Pub & Brewery. Retrieved October 16, 2017, from <http://www.vermontbrewery.com/history>

Community food work as critical practice: A faith-based perspective through narratives

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Abstract

Community food work is a framework for understanding the interconnections and complexities of food systems issues such as farm sustainability, food access and health equity, environmental resiliency, and social justice. An emerging yet overlooked perspective of community food work is the role of faith-based organizations and practitioners. In this single case study of six faith-based practitioners focused on urban food security in Virginia, we use narrative inquiry to explore how they understand and perform their community food work from a faith-based and social justice context. Our methods included interviewing each practitioner to create stories of their everyday work, researcher-participant analysis of those

stories, and a collective reflection session of the group's narratives. The final narratives not only point toward specific social justice values and practices aimed at addressing race and class inequity in the food system as significant elements of their community food work, but also created new space for practitioner reflection and discovery of the way white privilege and class-based assumptions can be uncovered and challenged in the work itself. In this way, the research describes what community food work looks like through a faith-based lens, while also showing how storytelling and narratives can be used as an approach to create possibility for critical reflection about power and privilege in our everyday practice. We conclude with suggestions for using storytelling and narrative inquiry in similar food system contexts as a strategy for community change.

Keywords

Community Food Work; Critical Consciousness; Faith-Based Organization; Food Security; Narrative Inquiry; Whole Measures for Community Food Systems

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Introduction and Literature Review

Wickedness of Food Insecurity in the U.S.

For many, food insecurity is a wicked problem that brings together various explanations as well as approaches to addressing the issue (Hamm, 2009). Descriptions of what is defined as food security range from household to community perspectives based on policy, grassroots, and academic influences (see Hamm & Bellows, 2003). For instance, the U.S. Department of Agriculture (USDA) deems households with members who face times where they do not have access to enough food for an active, healthy life as food insecure (Coleman-Jensen, Nord, & Singh, 2013). For others, food security work emphasizes food system change with the goal of developing healthy communities and local capacity that addresses community needs (Abi-Nader et al., 2009). According to the USDA, in 2016 food insecurity affected approximately 12.3% of households and has not significantly declined since a 2011 high of 14.9% (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017).

Since the early 1900s, many food-insecure Americans have avoided hunger by accessing government entitlement programs, also called the food “safety net” (Poppendieck, 1998; Winne, 2008). These subsidy programs—such as the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infant, and Children (WIC)—attempt to close the gap between some of those with low incomes and the marketplace (Fisher, 2017). However, these programs were downsized during the Reagan administration (Winne, 2008). As the federal government withdrew funding from these programs, charitable organizations stepped in to close the hunger gap. This move signaled the rise of institutionalized emergency food, primarily managed by nonprofit organizations and faith-based institutions (Winne, 2008).

While entitlement programs and charity reduce hunger, their entanglement in various political agendas and lack of focus on the underpinnings of hunger—poverty and inequality—generally leaves these programs as less-than-sufficient stopgap measures

(Poppendieck, 1998; Winne, 2008). Although these channels were intended to be temporary, they have become essential resources, initiating greater criticism of the industrial anti-hunger charity system (see Fisher, 2017). For instance, Cadieux and Slocum (2015) critique anti-hunger charity as a patronizing system of programs that do not seek systemic change. Anderson (2008) argues that the lack of public participation and decision-making in these programs, and the industrial food system altogether, perpetuates food insecurity. Furthermore, Fisher (2017) asserts that anti-hunger charity does not hold businesses accountable for low wages, worker exploitation, benefits cuts, and more. The limits and insufficiencies of charities do not go unnoticed by their staff, as Winne (2008) describes from his first-hand experience with food bank operators in Hartford, Connecticut.

Faith-Based Organizations and Food Security

Faith-based organizations (FBO) provide a space for members to express their faith through the missions and activities of the organizations’ programming (Schneider, Wittberg, Unruh, Sinha, & Belcher, 2011). According to Todd (2012), FBOs have played a role in development efforts by creating supportive community settings that may also help reduce social marginalization of historically underserved communities. Although the work of FBOs has been varied and at times controversial, we point to three primary reasons that faith-based organizations are involved in food systems work. First, there is an historical connection between faith and food because food serves faith-based functions across several religions (Mann & Lawrence, 1998). Second, many faith traditions have a philosophy to care for the poor (McGovern, Dole & Messer, 2005). Third, faith-based organizations generally have social and cultural capital that make them adept at engaging in social justice work (Rosenberger, Richards, Nevin Gifford, & Gossen, 2006; Todd, 2012); research suggests that high levels of social capital can increase a group’s success at food systems change (Crowe & Smith, 2012).

According to Dixon (2015), FBO staff and volunteers are candidates for social justice work.

They may advocate for social change by inquiring into and challenging the assumptions that those accessing emergency food fit the master narrative of being “too lazy to work” or “suffering a temporary hardship,” instead realizing that there are structural inequities that systematically disadvantage groups of Americans. Examples of faith-based organizations that perform social justice and advocacy work include Come to the Table in North Carolina,¹ the Baltimore Interfaith Food and Farms Program (Johns Hopkins Center for a Livable Future), and Ecumenical Ministries of Oregon,² all of which are dedicated to supporting the development of socially and environmentally just food systems. Each of these organizations has a commitment to long-term food systems change and equitable structures that engage people across racial and class lines.

Food Security and Community Food Work

Alternative food discourses and their respective food movements incorporate issues of human rights, sustainable production, human health, and democratic policy change that generally counter the corporatization of our agricultural and food systems. To some scholars, while social change is the goal, these alternative food movements have created spaces that build social, physical, and financial barriers for low-wealth and historically marginalized groups (Cadieux & Slocum, 2015; Guthman, 2008; Slocum, 2007). We find Slocum’s (2006, 2007) conceptualization of *community food work* as the prime way to infuse the alternative food movement with a more critical perspective on the complexities of food systems change.

According to Slocum (2006), community food work is food systems work that promotes fair prices, sustainable practices, and accessible, affordable, culturally appropriate, healthy food for all people. There are numerous intersecting practices that fall within these bounds, but they do not necessarily value inequity in food systems as a serious obstruction of justice. Community food work is naturally political and even criticizes alternative food movements (e.g., sustainable

agriculture, local food, animal rights) for their failure to acknowledge institutionalized biases in the food system, especially biases rooted in race, class, and gender politics (Guthman, 2008; Slocum, 2007, 2006). In the context of community food work, a recurring trend in U.S. history is the marginalization of minorities, especially people of color, which has resulted in a disproportionate rate of food insecurity now present in households within those communities (Alkon & Agyeman, 2011; Ramírez, 2014). In 2016, homes with a Black head of household had a food insecurity rate of 22.5%, whereas homes with a white head of household had a rate of 9.3% (Coleman-Jensen, et al., 2017). Anderson (2008) and others also argue that the U.S. agrifood system perpetuates food insecurity through the lack of participation in political decisions about food, elimination of traditional foodways, and environmental degradation that affects the sustainability of land and water resources.

In this research, we focused on community food work as one illustration of food systems change from a faith-based perspective. The increase in faith-based community food work organizations prompted us to explore (1) what values for pursuing community food work are present in everyday practice; (2) to what extent practitioners perform community food work from a social justice perspective (i.e., one that brings issues of power and privilege to the forefront of practice); and (3) how storytelling and narratives of community food work help create space for critical reflection about the ways in which we can better “see” and enact socially just community change. In the remainder of the paper, we illustrate the growing shift from faith-based charitable work to community food work to begin addressing these questions. We also highlight the ways in which practitioners understand and address the issue of social justice as a radical change in their efforts to create meaningful and inclusive food systems change. We focus on a single case study of six faith-based practitioners addressing urban food security in Virginia. From this perspective, we use narrative inquiry as a methodology to explore how these practitioners understand and perform their community food work from a faith-based and social justice context.

¹ <http://rafiusa.org/cttt/>

² http://www.emoregon.org/food_farms.php

Our methods included interviewing each practitioner to create stories of their everyday work, researcher-participant analysis of those stories, and a collective reflection session of the group's narratives. We begin with a description of the conceptual framework that guides our research and findings.

Conceptual Framework

We used a threefold conceptual framework in the design of this study. First, we drew from Slocum's (2006, 2007) concept of community food work, which focuses on the integration of such themes and domains as farm sustainability (e.g., farmer support, market linkage, and education), nutrition education (e.g., health and diet-related disease prevention), environmental sustainability (e.g., ecology and land-based sustainability), and social justice (e.g., farmworker/producer rights and hunger/food insecurity). This is reinforced by Tanaka, Indiano, Soley, and Mooney (2015), who describe community food work as simultaneously a community organizing *process* for concerned citizens, activists, and professionals to create new food systems, and a *goal* for attaining food security for their community.

We argue that locating their practice within the concept of community food work makes it more transparent and accessible for practitioners to communicate and share their complex work and the values that drive their actions (Abi-Nader et al., 2009). In this vein, we point toward a team of food security practitioners/scholars who created Whole Measures for Community Food Systems (CFS) to plan, evaluate, and talk about community food work and holistic food systems change. We used Whole Measures CFS as the second piece of our conceptual framework because it places a reflective lens on the work by focusing on practitioner dialogue around six fields and practices: *justice and fairness, strong communities, healthy people, vibrant farms, thriving local economies, and sustainable ecosystems* (Abi-Nader et al., 2009). These fields and practices are grounded in the values and value systems that inform the work of the practitioners and the communities in which they operate.

The third piece of our framework is the act of critically reflective practice, a concept from the

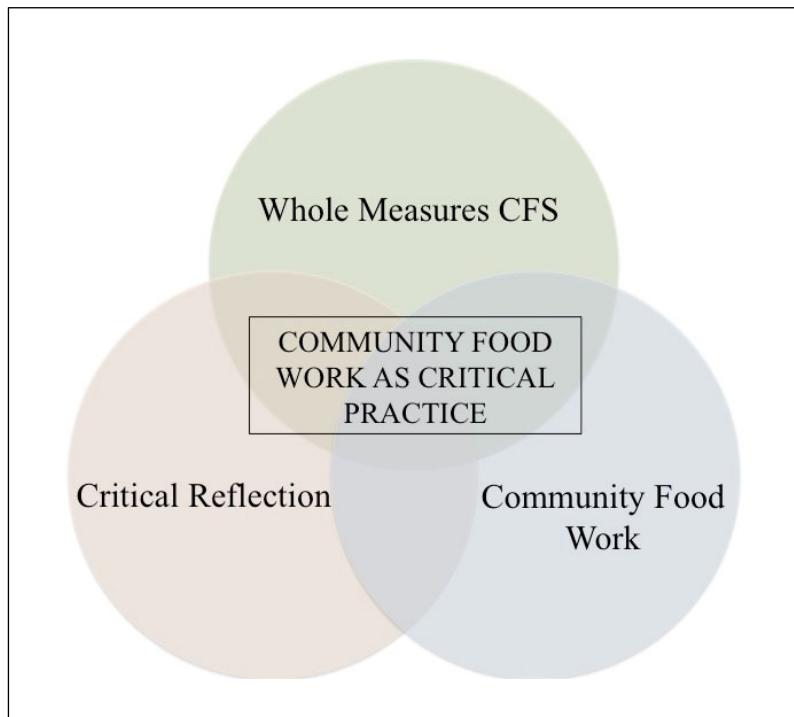
field of adult education.³ According to Brookfield (2001), critically reflective practitioners are those who take a mindful and purposeful approach to their educational work and seek to name and question the power relations that inform and govern educational actions and agendas. This approach is similar to Freire's (1972) critical pedagogy, in which critical reflection and dialogue about one's practice are sources of new ideas and possibilities for socially just ideas and actions. Thompson and Pascal (2012) and Cervero and Wilson (2001) further help us see how educational practice is a matter of negotiating the way micro and macro power structures influence our everyday decisions as practitioners; thus the role of critical reflection is important in order to "see" the way power governs educational and community change work.

We specifically used Brookfield's (1995) four lenses of critical reflection to explore the practice of community food work practitioners, framing the practice as a political act of education and social justice (Freire, 1972; Giroux, 2006). The lenses of critical reflection are (1) the autobiographical, (2) the students' eyes, (3) our colleagues' experiences, and (4) theoretical literature (Brookfield, 1995). Educational practice in this sense is the ongoing conversation between theory and reflection by the practitioner (Ford, Johnston, Brumfit, Mitchell, & Myles, 2005; Lather, 1991). These internal and external conversations about the way community food work is understood and performed are explored from the narratives in this study.

These three concepts come together to guide our research as a holistic conceptual framework (Figure 1). The intersection of these areas helps us illustrate the ways in which our case study practitioners understand and address the issue of social justice as a shift in their efforts to create meaningful and inclusive food systems change.

³ Critically reflective practice finds its roots in the German Frankfurt School, which stemmed from Marx's theories of false consciousness, commodification, praxis, and emancipation (Brookfield, 2001; Morrow & Torres, 2002). The philosophers of the Frankfurt School built a lineage of critical social theories critiquing capitalism. Thinkers including Hegel, Kant, Marcuse, and Habermas influenced the concepts of critical reflection and the critically reflective practitioner that we incorporated into this research.

Figure 1. Diagram of the Conceptual Framework Guiding this Study



Methodology

We designed a qualitative study and received approval from the Virginia Polytechnic and State University Institutional Review Board. We took a constructivist approach (Brookfield, 2009) for this research, which is important for two reasons. First, it placed practitioners as the experts of their own experiences and included them as co-creators of the knowledge presented in this research. Second, it allowed for new perceptions of the work to emerge as we learned throughout the story-making process. We used narrative inquiry to generate the stories with participants from this study, making them socially constructed and interpreted narratives (Brookfield, 2009). Therefore, the perspectives generated in the research are based on the social and political reality of the participants (Brookfield & Holst, 2011).

Narrative inquiry is a qualitative research method that captures experiences and meanings from the telling and retelling of stories (Clandinin & Connelly, 2000). We use “narrative” to mean both a storytelling process and a product (Richmond, 2002). This includes treating the narrative as the process of creating the story, as

well as the material outcome of the story itself.

Study Site and Participant Recruitment

The primary researcher contacted several organizations working in the mid-Atlantic and Appalachian regions of the U.S. for a preliminary discussion about participating in the study. The executive director of Welcome Table was the first to express interest. We had several phone conversations and formally invited the organization to participate after the executive director confirmed similar interest with the staff and board. We selected this organization because of its open expression of faith in its work, its farm- and city-based programs, and its participation in city and even statewide conversations and coun-

cils about food systems. From these observations, it was clear that this organization is a leader in food systems work in the Virginia city in which it operates. After agreeing to participate, the executive director served as our organizational liaison to invite his staff and program partners to participate in the research. At the end of recruitment, we had practitioners from two organizations take part in the project. It was important for the partnering organization to participate in the study because they are also faith-based and play an active role in Welcome Table’s flagship program. Following our IRB protocol, we assigned pseudonyms to the organizations and the participants to ensure anonymity of the participants and their organizations.

Welcome Table is a faith-based 501(c)(3) affiliated with a Christian church that engages in social and economic justice issues in a Virginia city and the surrounding region. Its flagship program is a prescription produce program, where food is grown on a 6-acre (2-hectare) organic farm and provided to program participants onsite in public housing communities as a weekly prescription coupled with health check-ups. Other programs include a youth-run farm stand that employs and

serves public housing and low-income communities; farmer-in-residence and social-work intern programs; and myriad volunteer experiences on the farm. Each of these programs aims to fulfill the organization's threefold goals of (1) growing healthy produce for underserved communities; (2) providing experiential learning to youth and adults; and (3) linking community groups. The partner agency, Fresh Start, is a coalition that works to reduce childhood obesity and collaborates with Welcome Table to administer the prescription produce program. Table 1 describes the practitioners who participated.

Data Collection and Analysis

We implemented a three-part data collection process. First, drawing upon a process similar to Peters and Hittleman (2003), Peters, Grégoire, and Hittleman (2004), and Niewolny and D'Adamo-Damery (2016), we conducted a 45 to 90-minute in-depth interview with each participant. The interview protocol was adapted from Niewolny and Landis (2014). This instrument was designed for the Appalachian Foodshed Project Practitioner Profiles in which practitioners were interviewed using three categories of prompts: (1) background and motivations for doing this work; (2) a practice story about a specific program or project; and (3) reflections on the practice story presented.

The second point of data collection also served as an analysis through the retelling of stories. We

provided each participant with their interview transcript to not only vet it for accuracy but to respond with emergent themes they found significant and excerpts to support their selections. Participant analysis was a crucial element to this study because it included participants as researchers and demanded concentrated individual reflection. We combined these participant analyses with our own analysis up to this point to plan the collective reflection session—the final piece of data collection and another piece of analysis.

Third, the collective reflective session was a time for dialogue between the practitioners as they reflected and learned about their work as a group and individually. We began the session by providing each participant with a Whole Measures CFS packet and discussing how we used the fields and practices to code the data. Next, we read excerpts from each narrative interview aloud to each other and facilitated continued conversation through a set of prompts. The reflective session allowed the retelling of stories shared in the narratives and the telling of new stories as they emerged.

The primary researcher managed all data collection and analysis. We recorded audio from all interviews and the collective reflection session, transcribed them, and uploaded them into Atlas.ti for analysis. The primary researcher coded all transcripts three times with regular input from the second researcher. We coded the transcripts using *a priori* codes developed from our conceptual

Table 1. Practitioner Roles and Demographics

Practitioner	Role	Age	Race	Education Level
Eddie	Welcome Table; executive director for five years	30s	White	Bachelor's
Taylor	Welcome Table; farm manager for five years	30s	White	Master's
Onyx	Welcome Table; board chair for less than one year; board member previously	50s	White	PhD
Terry	Welcome Table; community advocate; previous prescription produce plan participant; community resident	20s	Black	High School
Blaire	Welcome Table; newly hired program coordinator; previous social work intern	20s	White	Master's
Casey	Fresh Start; childhood obesity coalition coordinator; partners with prescription produce plan	40s	White	Master's

framework, codes identified by the practitioners through their vetting and analysis, and emergent codes. This dual inductive and deductive approach allowed us to address the guiding research questions while remaining open to other opportunities for depth and richness to emerge.

Results

We organized our findings around four primary themes. First, faith played a role at varying scales in each practitioner's work. Second, several of the fields and practices from Whole Measures CFS emerged through the practitioners' stories, primarily *justice and fairness*, *healthy people*, and *strong communities*. Third, critical reflection was practiced not only in the daily work of the practitioners, but over the entire course of this inquiry. Lastly, based on this reflection in the storytelling process, the practitioners uncovered and explored how power and privilege operate in their community food work.

Faith-Based Practice

Since each practitioner identified as a person of faith, we first grounded their practice in their spiritual or religious beliefs to the extent that the data allowed. The practitioners referenced faith directly 27 times during this narrative inquiry, despite only one question in the protocol directly referencing the practitioners' faith. However, there was a spectrum of significance among the participants. On one end of the spectrum, Onyx stated that her faith is the whole reason she is involved in this work:

Well I mean I go back to the faith piece. I mean I think for me that's it...I would say that many of us around this table get up in the morning knowing that we are doing this to create God's kingdom, or however we want to frame it in our heads, and that this is a hell of a lot of work and you don't do it unless you've got some bigger purpose.

At the other end of the spectrum, Taylor stated that he would be doing this work even if he were not a person of faith, simply because he loves the work.

But I don't want to act like that the reason I do what I do has anything to do with my faith as much as it has to do with just loving the work. I want to be fair. I wouldn't do it if I believed that this is the best thing that someone could be doing who really truly believed in God if I didn't really just love doing this kind of stuff.

Eddie brings a new perspective into the conversation by modeling his faith through actions rather than explicitly sharing his beliefs with others.

Faith is certainly kind of the guiding force and the reason why I do my work. We sort of as an organization probably embody that cliché, what people call the Francis idea, but I don't think St. Francis ever really said it: "Preach the gospel at all times, use words when necessary." I think for myself and Taylor that certainly drives the work we do. Not about trying to literally preach the gospel to anyone or use our work as an explicitly evangelical or evangelizing tool, but as a way to fulfill what we feel is our own obligation and desire and joy and gift and to be able to share that with others. That being said, with the exception of giving talks like I did on Sunday at a church or working with a church garden on Wednesday, I think a lot of our vocabulary is not explicitly Christian because these ideals are often broad universal ideals. They are beyond being Judeo-Christian ideals. I think we also feel an obligation to make sure that the work that we do doesn't turn anyone off or scare anyone away and allows folks to all feel like they have a place at the table here. So we try to use as welcoming programs and as welcoming language as possible without trying to hide from who we are and why we do what we do. Which is a delicate balance.

This might be cliché, but again as a result of my upbringing from my parents, whether you want to look at him as a historical figure, a mythical figure, or just a figure in the faith tradition, Christ is this cool example of

this food justice advocate, right? And it's a pretty cool model.

A primary theme of faith-based practice was the idea of being called to serve. Blaire offers this perspective from her place of faith:

I would say my faith tradition places a lot of emphasis on justice and how people of faith are called to promote justice, so I think justice and fairness and strong communities come a lot from recognizing that we have a responsibility to others and that we can't operate alone, so kind of looking at the body of believers and seeing that encompasses a lot of people. So knowing that we can't only look at taking care of one aspect—so our own community or our own family—and kind of seeing that all as interconnected so you can't see your own family without seeing another family.

The role of faith cannot be separated from the values incorporated in one's community food work, nor is faith the only source of practitioners' values. Keep this complexity in mind while reading and reflecting on the excerpts that follow.

Values from Whole Measures for Community Food Systems

Every field and practice from Whole Measures CFS emerged at some point throughout the narrative, although some were more prevalent than others. Justice and fairness, strong communities, and healthy people were the three fields and practices most heavily discussed. Following these were vibrant farms, thriving local economies, and sustainable ecosystems. Perhaps more revealing than what fields and practices were evident, is how these fields and practices are performed. Justice and fairness, strong communities, and healthy people were predicated on building and leveraging relationships. This piece of the work permeated our entire inquiry. Building relationships set the stage for practitioners and participants to develop trust and learn from each other, community members to meet each other and nourish their health (social, emotional, mental, spiritual), community members

to be connected to other resources, and partnerships to be created to deliver more holistic and effective programs. Blaire identified strong relationships as one of her own themes:

I think this is a core value for me, because strong communities and strong relationships are both developed over time for everyone—and are often neglected when we think about community needs. I also believe that these are essential to sustainable change and working towards social justice. Building a sustainable food system doesn't mean a lot unless there are groups of people in [the] community that are present and committed to supporting and participating in the system....As far as what makes them strong—I think that is harder to identify. I think I personally feel like I have strong relationships or am in a strong community when there is a sense of support and validation, and [a] perception of agency over circumstances or surroundings.

Terry sees a daily impact of the prescription produce program on relationships among the residents it serves.

I've seen relationships develop. Some of our clients didn't know anybody. A couple of them didn't come outside—they didn't get with anybody. And now they have a couple friends that they deal with. So I enjoy seeing that.

Healthy people is a theme that arose often out of Casey's narratives. There is the obvious connection here to the field of *healthy people* from Whole Measures CFS, and it is evidence that although we are separating faith from the fields and practices in theory, they are inseparable in practice. Casey's excerpt from the collective reflection session summarizes the role of faith in her work and the significance of the body as a gift:

I had mentioned that I think people of faith shouldn't accept the world the way it is, but that they should recognize and have

commitment to making the world a better, more vibrant, dynamic, just, fair place. So that's something that faith motivates me to action—to not accept the current reality. I also think from the faith perspective just that the body is a gift and that there's so much joy to be found in the body, but that's a challenge for so many people. And I think what the core values for me are just that food is so essential—so fundamental to people's health, happiness, spirituality, sense of community, and that's probably why all of us choose to work in this area, because it's so core to people's wholeness and wellness.

The theme of sustainable ecosystems emerged more in the collective reflection session after we provided the practitioners with the Whole Measures CFS framework. Eddie stated that this was important to him for the theological values of creation care and stewardship. Taylor also found meaning in these values and felt a responsibility to be the voice for those organisms without one, such as microbes in the soil. In the excerpt below, Taylor shares how he drew inspiration from feminist Christian theologian Sallie McFague, who wrote extensively about the earth as a metaphor for God's body.

So her [Sallie McFague] thing was that our primary vocation as a people is outlined in Genesis and that is to serve and to keep the earth. It's been translated a lot of different ways, but for her our vocation as a people is to do that. When I read it the first time I remember thinking, "You know one of the only ways I can think of for me to be able to do that is through growing food for people."

Critical Reflection on Practice

We sought for this research to facilitate critical reflection and explore how the practitioners reflect on their practice. Each lens that Brookfield (2001) identifies (autobiographical, students' eyes, colleagues' perspective, theoretical literature) is present in the practitioners' community food work.

The most common form of reflection our participants in this study perform is autobiographical reflection, but the group also references literature, makes occasional time to reflect through their colleagues' eyes, such as in staff meetings, and through their participants' eyes in conversation and program evaluations. The three points of reflection we facilitated were the (1) narrative interview, (2) participant analysis, and (3) collective reflection session.

Their reflections on race, specifically white privilege, demonstrate their critical awareness of inequity within food systems and other socioeconomic systems. The hegemony of traditional charity and class-based assumptions were topics of scrutiny for the practitioners too. A critical perspective emerged from Onyx's interview, as demonstrated below.

I think ideally we all envision, and I'm sure we have different visions, but it involves neighborhoods that have enough to eat; communities that everybody has enough to eat. Everybody has good food to eat and it's not brought in on a food bank truck and given away, or people don't have to go stand in line and fill out paperwork—do degrading things just to get good food or just to get food, period. Sustainable change would somehow turn all of that upside down, and it's all wrapped up in poverty, it's all wrapped up in racism, and those things are not solved by a food stand, unfortunately. So as wonderful as what we're doing is, it's a long way from making real systemic change, which is eliminating poverty, which is making the playing field fair, which is having a quality education not dependent on your zip code, having a safe place to live. I'm not sure that food and agriculture [practitioners] can make that change, but I think we can partner with enough other groups and enough other people and citizens and neighbors who together maybe we could start to turn those things around.

The excerpt from Eddie below gives us a glimpse into how he makes sense of himself and

his programming in a different cultural space, and how he addresses this friction in hopes of creating a safe, respectful space for dialogue to recognize difference and sameness.

To start by saying, “We’re all going to go around and say a healthy food that we really feel good about liking and an unhealthy food that we really like a lot as well.” That sort of creates open spaces for equity and saying, “Hey we’re all in this together, we all have a unique relationship with food.” Which for me is hovering between that space between acknowledging difference and saying, “Hey I want to get to know that difference” and then also being able to use that in a disarming way and say, “Hey because it’s food and it’s unique and individual, it’s personal, we can just talk one on one. This is not just me making any assumption about you or your culture, or you making any assumptions about mine.” This isn’t a black guy saying, “I can’t possibly have anything in common with what a white guy eats,” when we realize at the end of the day it’s just personal.

Beyond fostering greater personal fulfillment, reflection has pragmatic implications on one’s practice. Here, Casey explains how she makes decisions about what work to pursue by checking in with her values.

I feel like we’re just inundated all the time with more and more possibilities and they’re all exciting and you want to do all of them, but you can’t do all of them well. I can’t, so maybe for me it’s keeping these guiding principles somewhere visible so I’m reminded when a new opportunity comes I can be like, “Does this fit with what I care about? Does this further what is most important to me or us as an organization?” Just a check. It feels like we’re just trying to figure out one thing when we’re trying to start another thing when we’re trying to follow up with another thing we didn’t finish. So values and guiding principles are impor-

tant, and I think I can do a better job of checking in with those more often.

Eddie found a new way to reflect on his work when he was introduced to a new way of framing cultural competency. He acknowledges that he is an outsider in the communities he serves and makes no pretense of knowing exactly how to relate.

Somebody used the phrase cultural humility for me, which is a whole area of research that I wasn’t even really aware of, even though it’s an area that what they’re talking about makes perfect sense to me, but I never had a word for it before. I kept looking at it through the language and lens of cultural competency, which I think there’s still something to. I think they can be separate and both valuable. But that was a big “aha” moment to me, was to stop thinking about how can you make sure that your programs are totally understanding of this unique identity of this specific neighborhood, this specific culture, and how can you be more reflective on your role as an outsider and that all the research and planning and focus groups in the world are never going to make you understand what it’s like to live in poverty, what it’s like to live in the south side of this city or anything else. So how can we have that humility and reflectiveness built into our programs?

In this next excerpt from the collective reflection session, Blaire expresses her desire for more time for reflection, which was a common theme among the practitioners.

I think it’s really easy for your week to all of the sudden become a to-do list so then you stop thinking about why you’re doing your work, so then your work starts going in a different direction. Then at the end of the week you’re kind of like, “Wait, I don’t even remember what the point of the program is.” You’re just like, “I just need to get this produce out!” You forget, “Oh, I’m doing

this because it's a justice issue." So you kind of forget the whole right and privilege framework. I think it would definitely be helpful to start checking in with that more often...

These and other remarks indicate the absence of critical reflection afforded in practice as well as the potential fruits it can yield. The following interaction from the collective reflection session demonstrates the open peer-to-peer conversations that can enhance understanding and appreciation for one another, and lead to explaining intentional organizational choices.

Casey: Just getting people excited and exuberant about the possibilities of good food and then changing the environment so that they can act on that excitement, that commitment, and desire.

Taylor: To me that sounds so much more difficult than growing the food. Because I know where my skills are.

Onyx: You don't want me at the farm.

Terry: No, first bug I'm gone. Hot, rain, you got a tough job on you.

Blaire: Well, you know how you were talking about not feeling connected or not feeling like the program stuff is within your scope? That's totally me at the farm. I'm like, "Wow, we grow a lot of stuff out here!" Even if it's just lettuce.

Eddie: I do think that's a part of our organizational goal or truth that we try to acknowledge, and we've done more and more of that I think in the last year, which is as an organization having people that have very different skill sets, that can do what they do very differently knowing that it's very complex problems.

Revealing Power in Community Food Work

The stories additionally illustrate how practitioners challenged dominant power structures in their work. The group of practitioners specifically refer-

red to white privilege, class-based assumptions, and charity throughout their stories and group reflections. White privilege surfaced the most frequently as a concept the practitioners were wrestling with themselves and something they wanted to bring to light within the wider community. The excerpt below from Blaire's narrative demonstrates her acute awareness of her privilege, and the struggle it still presents to her on a daily basis at work.

I think definitely the privilege part of having to come to terms with like, "I'm a privileged white girl that's trying to do good things at the right communities" is really challenging. I mean in this city no matter what underserved community you're part of, it's probably not a white community, which was really challenging because coming from a more rural place I identified with a lot of the communities I was serving.

Eddie offers a similar perspective and a critical awareness of biased systems that have afforded him his privileges.

So I have been lucky and blessed not only to have every advantage in my backpack, but to also be able to see that that's not an accident. That why I'm here is not an accident and that there are systems propping me up that allow me to be here that as a result I feel a responsibility, when able, to be a part of dismantling those systems, and creating just, verdant, and equitable communities, to use the NPR Foundation.

The recognition of difference and white privilege came from the Welcome Table program participants as well, although they may not have labeled it as such. Furthermore, the data below comes from the practitioners and not Welcome Table's participants, so it is impossible to draw strong conclusions about their criticality. Terry and Onyx, respectively, provide glimpses into the consciousness-raising effect that Welcome Table's programs have on youth.

The little children they really enjoy it. They're like, "Those people are rich!" Do you know that she has a house?" Even though the program is mainly about vegetables, just to see people from other places is great for them.

I think that people have to get angry. I work with a lot of teenagers from the Southside and Northside from the housing projects, and they're not angry. They don't realize how unfair it is. Some of them do. Actually some of them *really* do, but they're a small number.

Essential to revealing hegemonies is pushing oneself out of one's comfort zone. By engaging with these new experiences, practitioners are learning about themselves and their boundaries in their practice. One of the benefits of doing the work is the ability to push those boundaries and be better because of it, as reflected through Casey's excerpt below.

I think our involvement is not just to help others, but to help ourselves become compassionate and more patient and more aware and conscious. I don't see this work just to help others. I feel like I'm also helping myself and my family—all of us be better.

Similarly, Onyx acknowledges how worthwhile it is to push the boundaries of comfort as she was compelled to make change.

It has to be hard....We have to get out of our comfort zone, and I guess I can't make anybody else change, but I have to figure it out for myself. And then the path just started opening. I can't say that I specifically sought anything out or did anything, I just said, "Yes" to things that got put in my path, and so this organization was sort of my baby step in that direction. They were dealing with those hard issues, and it wasn't too scary, you know? I didn't have to go alone into the housing projects, I didn't have to get to know people too intimately, but it

was a step in the right direction and it gave me a little bit of awareness that I didn't have before. It just helped me start learning.

Acknowledgement of such a pervasive power does not remove its ability to dictate social circumstances. However, it is an important first step to reveal and name the way power governs our community food work in the everyday sense. These stories illustrate how practitioners understand the ways in which their daily practice is influenced by their assumptions, which, if not addressed, can unwittingly influence their practice. To read the full narratives from the research, see Landis (2015).

Discussion

Community food work and its emancipatory potential are underexplored compared to other, long-standing food systems discourses, such as food security and food sovereignty. In this study, we frame community food work as critical practice. Specific aspects of community food work that resemble critical practice as community development include an asset-based approach that draws upon the talents of individuals in the community (Mathie & Cunningham, 2003), building leadership and capacity from within the community (Anderson, 2008), and creating collective movements and institutions (Brookfield & Holst, 2011). From an assets-based perspective (see Emery & Flora, 2006), we argue that community food work is a space for learning, especially through storytelling. Telling one's own story and hearing colleagues' stories may expand our practitioner perspective and help us navigate new ideas, roles, and opportunities for socially equitable outcomes. Through their efforts to build and nurture relationships, provide public housing communities with the resources to access produce, and create leadership from within those communities, the practitioners in this study are working to raise what Freire (1973) refers to as critical consciousness. In other words, there is the potential within community food work to consider one's own thoughts, implicit biases, and assumptions that undergird not only the work, but also one's participation in the larger social context of food security and social justice. This reconsideration allows for new possibilities to emerge.

While the activities of their community food work are similar to countless organizations, these practitioners' faith-based approach, combined with their critique of structural inequity, elevate their practice as an informative window into community food work from a faith-based and social justice context. Much of the work they do would fall under Guthman's (2008) characterizations of nascent food justice work, including growing fresh produce, providing it at below-market prices, and educating residents about the food. This narrative inquiry reveals that there is positive potential in these projects and that they are not necessarily creating patronizing relationships. Guthman (2008) names the problem in many of these endeavors as the "effect of white desire to enroll black people in a particular set of food practices" (p. 433). The practitioners seem to be countering this by using their programs as a venue for dialogue and relationship-building, and through their constant effort to consider the perspectives of program participants. However, we make this claim tentatively, since a far deeper inquiry would be needed to draw a more informed conclusion.

The practitioners in this research know their work is not easy, but they do not allow themselves to become paralyzed in the struggle. Rather, they seek to support their communities by finding the positive and possibilities for hope. Peters, Grégoire, and Hittleman (2004) emphasize how important it is to practice a pedagogy of hope, and we see this pedagogy embodied in the practitioners' stories. Niewolny and D'Adamo-Damery (2016) relate this need for hopefulness directly to learning for food systems change, emphasizing the possibilities and strategies in our everyday meaning-making through story, which can humanize and bring dignity to the work itself. In practice, hope can come from the small victories that encourage and give life to the sometimes tumultuous and conflicting moments of community food work. The commonality of faith to each practitioner in this study likely contributed to the bonding social capital of the group (Emery & Flora, 2006).

On a hopeful note, Slocum (2007) suggests that practitioners move past critiques of neoliberalism and capitalism to look for the possibilities offered by community food work. She wishes to

see how racial difference and connection can be better understood through these practices. The narratives do just that. They help us understand how messy and complicated, yet deeply rewarding, the practice of community food work is at the everyday level. They also show us where the tensions lie, pointing toward the spaces that could lead to harmful actions in our practice for food systems change (Slocum, 2007). In this way, despite the practitioners' criticisms of charity work, they see the present need for it and are hopeful that their work will diminish that need for future generations.

There are myriad challenges to building community food systems. Community food work is premised on critiquing and transforming the current agrifood system into more just and equitable systems. Faith-based organizations are integral players in this work. This study has demonstrated how in one case they actually conduct the work with a critically reflective practice in mind, and hope to continue that reflection as a result of sharing their stories of work. In conclusion, this narrative inquiry was not meant to raise a certain set of practices as the gold standard for community food work through a faith-based lens. Instead, the stories indicate how the work is messy, challenging, and never complete. The stories create space for critical engagement with such complexity in hopes of creating new and just opportunities in the future.

Recommendations for Research

While our approach was productive in meeting our research goals, the interviews and reflection sessions we used could be arranged using different techniques to stimulate further reflection; we see space here for creative approaches to organizing reflection individually and collectively. To expand upon the narrative methods from this study, we suggest using an adapted version of Stephen Brookfield's Critical Incident Questionnaire to begin a collective reflection session (Brookfield, n.d.). This is a straightforward start, using only a few questions to elicit reflection on critical moments, such as "aha" moments or meaningful moments. Furthermore, techniques and steps used in Appreciative Inquiry (Whitney & Cooperrider, 1998) would provide an assets-based approach to

engage practitioners in autobiographical and peer reflection. These steps would include interviewing a colleague about a positive experience and then reporting back to the larger group. Appreciative Inquiry may also help to bridge the divide between silos of work because it builds a collective vision and uses a group process to choose steps to achieve that vision. Additionally, future research could incorporate even more participant analysis. Lather (1991) and hooks (1994) suggest such methods as an emancipatory approach to teaching and research. We recommend providing the participants with several opportunities to engage in analysis and meaning-making. A process could be designed where each party would build upon previous analyses, such that both are active subjects in the creation of the knowledge (hooks, 1994). This process would improve the reliability of the study as described by Lather (1991). Although these additional reflective methods were outside the scope of this study, they would likely yield rich insights into more cases of community food work.

Enhancing practitioner perspectives with program participant and community member perceptions could further illustrate the concepts of critical consciousness-raising according to Freire (1973). Richmond (2002) explains that transformative learning can occur when groups come together to critically reflect. Understanding how community food work can raise critical consciousness was not an intent of this research; rather it emerged toward the conclusion of our analysis. Its significance to social justice and social change, and connection to critical reflection as ideology critique in food systems, warrants further exploration.

We believe it is important to emphasize narrative inquiry as research directly with practitioners. The practitioner perspective, through storytelling, is less understood yet is needed to support the work of food systems advocates and change-makers. The role of faith-based practitioners in community food work is even less explored. Hamilton and Appleby (2009), among others, state that practitioners research has the potential to contribute to the use of practical knowledge for those both in and outside of that role. To build upon the methodologies from this practitioner-focused research, we recommend spending time

building trust with the participants to allow for a deep level of reflection and openness. This will take a lengthier time commitment from participants, and may be impractical in the many situations where practitioners are extremely busy with work-related duties. Exploring ways to build this into our organizational culture of applied food systems research could be an additional avenue for this research to continue.

Lastly, Reynolds and Vince (2004) challenge the predominant notion that reflection is an individual process, and present ways of thinking about learning through reflection as a collective endeavor. Organized reflection with practitioners engages collective experience to inform individual experience (Raelin, 2004). Reynolds and Vince (2004) believe that the internal dialogue of reflection is stimulated and enhanced by external dialogue, and does not end once the external dialogue ends. Future research could better explore the impact of collective reflection on individual experience by juxtaposing collective reflection sessions with subsequent individual interviews in a long-term study of practitioners of community food work.

Recommendations for Practice

For those interested in using narratives and storytelling to learn more about their and their organization's work, we have some suggestions for next steps. First, we stress that a discussion about and allocating time for reflection in your work should be prioritized. Crafting stories and periodically discussing them as a group can enhance reflection. This would mirror the collective reflection session, which was a positive experience for the group of practitioners in this study. Further, a significant aspect of these practitioners' work is to reflect on and celebrate the small victories of the work. Although community food work challenges systemic inequality, small changes can be the building blocks to systemic change. It is important to remain positive as a practitioner and enjoy the small victories and the people along the way.

We also suggest using Whole Measurers CFS as a tool to begin with or continue the process of reflection through the planning and evaluation of programs and projects. Whole Measures CFS need not be used in its entirety. It can be useful by

referring to specific sections as an appropriate starting point to begin reflecting on the values that inform our work. Similarly, the example of Dixon's (2015) use of counter-stories to disrupt deeply held beliefs about hunger and poverty as a pathway to mobilize charity volunteers as advocates of policy change is a practical application of critical reflection informing practice.

It is also important to point out that the narratives have numerous ways in which they can help generate opportunities for learning about community food work beyond the faith-based perspective. According to Niewolny and D'Adamo-Damery (2016), this would include appreciating the stories as personal experiences where we can learn about actual practice or strategies to put into practice. They also suggest viewing narratives as spaces of understanding that can help humanize the wickedness of the issues that inform and shape our community food work. For some, food insecurity is one such issue. In this way, we suggest that narratives not only help create understanding when read and shared, but also can generate a deeper sense of empathy for those whose lives are most affected, which in turn brings more hope and dignity to our communities. For more examples of stories of community food work that stretch across a region and address practitioner perspectives, including faith-based community food work, visit the Stories of Community Food Work in Appalachia initiative (Niewolny, 2016).

Conclusion

Community food work presents an opportunity whereby practitioners and participants alike are faced with critical issues such as racial and class inequality. This case study revealed how faith-based practitioners used critical reflection, through storytelling, to confront and begin restructuring current racial and class disparities in food systems. Such disparities are a consequence of deep-rooted power imbalances in our political and economic systems.

References

- Abi-Nader, J., Ayson, A., Harris, K., Herrera, H., Eddins, D., Habib, D.,... Villanueva, L. (2009). *Whole measures for community food systems: Values-based planning and evaluation*. Retrieved from <http://wholecommunities.org/resources/>
- Alkon, A. H., & Agyeman, J. (2011). *Cultivating food justice: Race, class and sustainability*. Cambridge, Massachusetts: MIT Press.

The role faith played in their work varied among the practitioners, from being the foundation of their involvement in the work to being an auxiliary benefit. Using Whole Measures CFS as a stimulus for critical reflection was an effective method to generate these values-based insights on community food work. Justice and fairness, especially racial and economic, were prominent themes throughout the narratives. Building strong communities emerged in the sense of forging strong, trusting relationships between the practitioners and program participants as well as between the participants themselves. By bridging racial, economic, and cultural divides, the practitioners engage with program participants who are systemically marginalized yet are full of opportunity to make the change they seek. By conducting the research in this way, the role of critical consciousness-raising is brought to the forefront, which encourages us to realize and acknowledge this marginalization and to begin dismantling systemic oppression where it connects with our community food work. Healthy people was the third most common field of practice to emerge from the narratives, and from the practitioners' collective perspectives, healthy people took on a holistic sense, including mind, body, and spirit.

To conclude, the conversation between theory and practice is a necessary element of critical practice. As we have illustrated in this study, the conversation is valuable to community food work practitioners. Storytelling is an effective approach to stimulating critical reflection. Stories can reveal new perspectives and possibilities in one's community food work as well as humanize the work itself. Blurring the line between practitioner and scholar allows for the co-creation of knowledge that is useful to inform both community food work theory and its practice. The research methods applied here can easily be transferred to other settings, revealing more about the values-based nature of community food work and its potential for enacting socially just community change.



- Anderson, M. D. (2008). Rights-based food systems and the goals of food systems reform. *Agriculture and Human Values*, 25, 593–608. <http://dx.doi.org/10.1007/s10460-008-9151-z>
- Brookfield, S. (n.d.). Critical Incident Questionnaire. Retrieved March 16, 2016, from <http://www.stephenbrookfield.com/ciq/>
- Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey-Bass.
- Brookfield, S. (2001). Repositioning ideology critique in a critical theory of adult learning. *Adult Education Quarterly*, 52(1), 7–22. <http://dx.doi.org/10.1177/07417130122087368>
- Brookfield, S. (2009). The concept of critical reflection: Promises and contradictions. *European Journal of Social Work*, 12(3), 293–304. <http://dx.doi.org/10.1080/13691450902945215>
- Brookfield, S. & Holst, J. (2011). *Radicalizing learning: Adult education for a just world*. San Francisco: Jossey-Bass
- Cadieux, K. V., & Slocum, R. (2015). What does it mean to *do* food justice? *Journal of Political Ecology*, 22, 1–26. Retrieved from http://jpe.library.arizona.edu/volume_22/Cadieuxslocum.pdf
- Cervero, R. M., & Wilson, A. L. (2001). *Power in practice*. San Francisco: Jossey-Bass.
- Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass.
- Coleman-Jensen, A., Nord, M., & Singh, A. (2013). *Household food security in the United States in 2012*. USDA Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/45129/39937_err-155.pdf?v=42199
- Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2017). *Household food security in the United States in 2016* (Economic Research Report No. ERR-237). Washington, D.C.: USDA Economic Research Service. Retrieved from <https://www.ers.usda.gov/publications/pub-details?pubid=84972>
- Crowe, J., & Smith, J. (2012). The influence of community capital toward a community's capacity to respond to food insecurity. *Community Development*, 43(2), 169–186. <https://dx.doi.org/10.1080/15575330.2011.575230>
- Dixon, B. (2015). Rewriting the call to charity: From food shelf volunteer to food justice advocate. *Journal of Agriculture, Food Systems, and Community Development*, 5(2), 71–79. <http://dx.doi.org/10.5304/jafscd.2015.052.010>
- Emery, M., & Flora, C. B. (2006). Spiraling-up: Mapping community transformation with community capitals. *Community Development*, 31(1), 19–35. <http://dx.doi.org/10.1080/15575330609490152>
- Fisher, A. (2017). *Big hunger: The unholy alliance between corporate America and anti-hunger groups*. Cambridge, Massachusetts: MIT Press.
- Ford, P., Johnston, B., Brumfit, C., Mitchell, R., & Myles, F. (2005). Practice learning and the development of students as critical practitioners—some findings from research. *Social Work Education*, 24(4), 391–407. <http://dx.doi.org/10.1080/02615470500096910>
- Freire, P. (1972). *Pedagogy of the oppressed*. New York: Continuum International Publishing Group.
- Freire, P. (1973). *Education for critical consciousness* (M. B. Ramos, Trans.). New York: Seabury.
- Giroux, H. (2006). Academic freedom under fire: The case for critical pedagogy. *College Literature*, 33(4), 1–42. <https://dx.doi.org/10.1353/lit.2006.0051>
- Guthman, J. (2008). Bringing good food to others: Investigating the subjects of alternative food practice. *Cultural Geographies*, 15(4), 431–447. <http://dx.doi.org/10.1177/1474474008094315>
- Hamilton, M., & Appleby, Y. (2009). Critical perspectives on practitioner research: Introduction to the special edition. *Studies in the Education of Adults*, 41(2), 107–117. <https://dx.doi.org/10.1080/02660830.2009.11661576>
- Hamm, M. W. (2009). Principles for framing a healthy food system. *Journal of Hunger and Environmental Nutrition*, 4(3-4), 241–250. <https://dx.doi.org/10.1080/19320240903321219>
- Hamm, M., & Bellows, A. (2003). Community food security and nutrition educators. *Journal of Nutrition Education and Behavior*, 35(1), 37–43. [https://dx.doi.org/10.1016/S1499-4046\(06\)60325-4](https://dx.doi.org/10.1016/S1499-4046(06)60325-4)
- hooks, b. (1994). *Teaching to transgress: Education and the practice of freedom*. New York: Routledge.
- Landis, R. (2015) *Community food work as critical practice: A faith-based perspective*. Unpublished master's thesis, Virginia Polytechnic and State University, Blacksburg, Virginia. Retrieved from https://vtechworks.lib.vt.edu/bitstream/handle/10919/56581/Landis_RD_T_2015.pdf?sequence=1

- Lather, P. (1991). *Getting smart: Feminist research and pedagogy with/in the postmodern*. New York: Routledge.
- Mann, P., & Lawrence, K. (1998). Rebuilding our food system: The ethical and spiritual challenge. *Earth Ethics*, 1998 (Spring/Summer), 21–26.
- Mathie, A., & Cunningham, G. (2003). From clients to citizens: Asset-based community development as a strategy for community-driven development. *Development in Practice*, 13(5), 474–486.
<http://dx.doi.org/10.1080/0961452032000125857>
- McGovern, Dole & Messer. (2005). *Ending hunger now*. Minneapolis, MN: Fortress Press.
- Morrow, R. A. & Torres, C. A. (2002). *Reading Freire and Habermas: Critical pedagogy and transformative social change*. Amsterdam, New York: Teachers College Press.
- Niewolny, K. (2016). *Stories of community food work in Appalachia: Opening space for storytelling and learning*. Blacksburg: Virginia Tech. Retrieved from <http://blogs.lt.vt.edu/niewolny/>
- Niewolny, K., & D'Adamo-Damery, P. (2016). Learning through story as political praxis: The role of narratives in community food work. In J. Sumner (Ed.), *Learning, food, and sustainability: Sites for resistance and change* (pp. 113–132). New York: Palgrave/Macmillan.
- Peters, S. J., Grégoire, H., & Hittleman, M. (2004). Practicing a pedagogy of hope: Practitioner profiles as tools for grounding a guiding collective reflection in adult, community, and youth development education. In M. Reynolds & R. Vince (Eds.), *Organizing reflection* (pp. 194–219). Hampshire, England: Ashgate.
- Peters, S. J., & Hittleman, M. J. (Eds.). (2003). *We grow people: Profiles of extension educators*. Ithaca, NY: Cornell Cooperative Extension.
- Poppendieck, J. (1998). *Sweet charity? Emergency food and the end of entitlement*. New York: Penguin Group.
- Raelin, J. (2004). Forward. In M. Reynolds & R. Vince (Eds.), *Organizing reflection* (pp. xi–xii). Hampshire, England: Ashgate.
- Ramírez, M. M. (2014). The elusive inclusive: Black food geographies and racialized food spaces. *Antipode*, 47(3), 748–769. <http://dx.doi.org/10.1111/anti.12131>
- Reynolds, M., & Vince, R. (2004). *Organizing reflection*. Hampshire, England: Ashgate.
- Richmond, H. J. (2002). Learners' lives: A narrative analysis. *The Qualitative Report*, 7(3). Retrieved June 1, 2015, from <http://www.nova.edu/ssss/QR/QR7-3/richmond.html>
- Rosenberger, N., Richards, L., Nevin Gifford, L., & Gossen, K. (2006). *From our own soil: A community food assessment Benton County, Oregon, and its foodshed*. 2006. Portland: Ecumenical Ministries of Oregon. Retrieved from <http://www.emoregon.org/pdfs/IFFP/CorvallisFoodAssessmentReport-logo.pdf>
- Schneider, J., Wittberg, P., Unruh, H., Sinha, J., & Belcher, J. (2011). Comparing practical theology across religions and denominations. *Review of Religious Research*, 52(4), 405–426.
- Slocum, R. (2006). Anti-racist practice and the work of community food organizations. *Antipode*, 38(2), 327–349. <http://dx.doi.org/10.1111/j.1467-8330.2006.00582.x>
- Slocum, R. (2007). Whiteness, space and alternative food practice. *Geoforum*, 38, 520–533. <https://dx.doi.org/10.1016/j.geoforum.2006.10.006>
- Tanaka, K., Indiano, E., Soley, G., & Mooney P. H. (2015). Building capacity for community food work: The geographic distribution of USDA community food projects competitive grant program. *Journal of Agriculture, Food Systems, and Community Development*, 5(3), 97–111. <http://dx.doi.org/10.5304/jafscd.2015.053.006>
- Thompson, N., & Pascal, J. (2012). Developing critically reflective practice. *Reflective Practice: International and Multidisciplinary Perspectives*, 12(2), 311–325. <http://dx.doi.org/10.1080/14623943.2012.657795>
- Todd, N. R. (2012). Religious networking organizations and social justice: An ethnographic case study. *American Journal of Community Psychology*, 50, 229–245. <http://dx.doi.org/10.1007/s10464-012-9493-y>
- Whitney, D., & Cooperrider, D. (1998). The appreciative inquiry summit: Overview and applications. *Employment Relations Today*, 25(2), 17–28. <http://dx.doi.org/10.1002/ert.3910250203>
- Winne, M. (2008). *Closing the food gap: Resetting the table in the land of plenty*. Boston, Massachusetts: Beacon Press.

Oregon producer and consumer engagement in regional food networks: Motivations and future opportunities

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Abstract

Local and regional food marketed through direct and intermediated channels has been increasing in the U.S., with studies of producers and consumers conducted at different places and times illuminating the trend. Oregon producers and consumers have shown long-running interest in local agriculture, with direct markets providing a well-established connection between fresh and local food. To examine motivations and barriers for the continued development of the Oregon regional

food network (RFN), we conducted in-depth surveys of Oregon producers and consumers across economic, social, and environmental variables. We identify some salient characteristics of farm enterprises that contribute to the RFN through different types of marketing channels, and consumer perceptions and utilization of RFN marketing channels. By analyzing producer and consumer surveys side by side, we identify opportunities for greater integration of food system actors within the RFN if producers, supply-chain partners, and consumers come together to realize the potential in regional marketing channels, particularly sales to retail, institutions, and regional distributors with differentiated products based on place of origin. Using Oregon as an example, we find overall trends and nuanced distinctions by looking across the diverse agricultural and marketing landscapes, giving some insight into local and regional food

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system motivations that may also be useful to farmers, policy makers, and researchers in this and other regions.

Keywords

Food Systems; Regional Food Network; Environment; Production Practices; Farm Size; Local Food Systems; Producer Survey; Consumer Survey; Beginning Farmers

Introduction and Literature Review

Oregon agriculture is very diverse, with long-running interest in alternative production and marketing practices. Over 220 crops are produced by more than 35,000 small- to large-scale farms over a range of landscapes, from the fertile wet Willamette Valley to the high deserts of eastern Oregon (Sorte & Rahe, 2015). Oregon has both dense population centers and many isolated rural communities, where consumer access to local foods varies considerably. Oregon has been a leader in the alternative and local food movement for decades: it is home to one of the first third-party organic certifiers, Oregon Tilth (Guthman, 2004), it has the fifth-highest acreage in organically certified production (USDA NASS, 2015), and ranks eleventh in number of farms engaged in direct-to-consumer food sales and 18th in sales value (Oregon Department of Agriculture, 2016). The strong interest in local and regional food may stem from the integral role farming and ranching plays in Oregon's economy and culture, as 20 percent of the state agricultural output stays in the state (Oregon Department of Agriculture, 2016; Sorte & Rahe, 2015).

Food production and consumption within the state can be thought of as a regional food network (RFN), which is smaller than the global and national food distribution networks but still participates in these larger chains through imports and exports. The Oregon RFN is also composed of local food systems that vary in size based on local production and marketing capacity, transportation and infrastructure, and consumer demand (Clancy & Ruhf, 2010). While public policy and supply-chain partners can play a role in motivating and removing barriers to RFN development, opportunities to enhance and expand the Oregon RFN

ultimately must involve a "meeting of the minds" between producers and consumers in the marketplace. Producers benefit from consumer data to direct their farm production and certification investments more effectively, while public and private RFN actors must better understand opportunities and constraints so they can make appropriate investments in education and infrastructure. Although Oregon has a unique and well-developed culture of RFN marketing, emerging RFNs in other parts of the world may learn from successful RFNs such as Oregon.

While many researchers have interviewed subsets of agricultural producers, and others have sought to understand consumer interest in local or regional foods, fewer have simultaneously surveyed both producers and consumers in a region, as we did in 2016. We identified salient characteristics, motivations, and barriers for producers contributing to the Oregon RFN, while gauging consumer perceptions and utilization of RFN marketing channels. By analyzing producer and consumer surveys side by side, we explore opportunities for greater integration of food system actors within the RFN. We perceive some overall trends and nuanced distinctions by examining the diverse agricultural landscapes of Oregon, thus gaining insight into local and regional food system motivations that may be useful to farmers, policy makers, and researchers in this and other regions.

Surveys of Agricultural Producers

In the U.S., producer participation in local and regional food systems has grown in recent decades, both direct-to-consumer sales and intermediated sales to institutions, restaurants, distributors, and retailers (Low et al., 2015). Research into producer motivation shows that small and midsized producers utilize multiple marketing channels (Liang & Dunn, 2014; Low & Vogel, 2011). Many studies have focused on one region and one type of alternative marketing channel, such as agritourism, community supported agriculture (CSA), farmers markets, or intermediated sales. In one survey, smaller operations were more motivated by consumer and community connections and enhancing sustainability; while facing more barriers, a significant number felt that participation in alternative

marketing channels improved their financial viability (Liang & Dunn, 2014; 2016). In California, CSA producers were motivated by an obligation toward CSA members, while farm income ranked relatively low (Galt, 2013). Research on alternative food supply chains that sell into regional or national markets is a rich and growing field, but most involve case studies of the supply-chain business partners rather than focusing on the producers (e.g., Ostrom, 2013; Stevenson, 2013; Stevenson & Lev, 2009; 2010; 2013).

Surveys of Local and Regional Food Buyers

A comprehensive USDA review of local food systems reports the ample work on consumer perceptions and willingness to pay for local or regional food (Martinez et al., 2010). Some studies find that local food purchasers resemble all grocery shoppers demographically, while others show a stronger interest in local foods from shoppers who are female, have higher income and education, cook at home more, have more interest in personal health, and have preferences for the type of foods available locally (Chang, Xu, Warmann, Lone, Munzimi, & Opoku, 2013; Maples, Morgan, Interis, & Harri, 2013; Wilson, Di Salvo, Quinn, Englot, & Mitchell, 2014; Wolf, Spittler, & Ahern, 2005).

Consumer surveys have shown that social and environmental concerns have become increasingly important over time (Knudson, 2010). In a national survey, the most important reason for buying local food was “proven health benefits,” while public attributes dominated the next three reasons: “supporting local economy,” “farmers receiving fair share of economic returns,” and “maintaining local farmland” (Onozaka, Nurse, & McFadden, 2010). Other studies have found salient motivations such as animal welfare, environmentally sensitive production practices, and improved public health (Knudsen, 2010; Thilmany, Bond, C. A., & Bond, J. K., 2008).

Studies in various states of the willingness to pay for different types of locally labelled products shows 9 percent to 50 percent price premiums depending on perishability, base price, and attitudes toward local foods (Burnett, Kuethe, & Price, 2011; Martinez et al., 2010, Figure 9). One study of willingness to pay concluded that

consumer demand for local food is independent of typical attributes of local foods, such as freshness (Darby, Batte, Ernst, & Roe, 2008).

Institutions, restaurants, and retailers are also responding to consumer demand for local foods (Martinez et al., 2010). Nelligan, Cameron, Mackinnon, & Vance (2016) found institutional buyers in Canada motivated by getting fresher food from local producers and supporting the local economy, although they reported little demand from customers and did not perceive a price premium. However, different clientele can provide other motivations: collegiate food service managers were willing to pay a price premium for sustainable production practices, reflecting that college students wanted their campus food to be produced sustainably and humanely, with workers receiving a fair wage (Feenstra, Allen, Hardesty, Ohmart, & Perez, 2011).

Surveys of Both Producers and Buyers

Looking at consumer and producer preferences separately—by time, place, and demographic groups—limits our ability to understand the relationships and networks formed in an RFN. Studies of both producers and consumers are limited to certain marketing channels; for example, one study found that both CSA farmers and members were motivated by moral obligation and concern for the environment, more than by the price of the farm share (Cone & Myrhe, 2000). A study of intermediated sales found that distributors and grocery stores had uneven support for environmental and social values, while growers shared core values of economic, environmental, and social sustainability (Lerman, 2013). Peterson, Selfa, and Janke (2010) found that the only value statement shared by producers and institutional buyers was a “sense of belonging” to the Kansas local community. These studies conclude that a mismatch in values inhibits producer gains from intermediated RFN sales, because information about farm practices may not be adequately transmitted to consumers and consumers may not perceive benefits from their purchases to local and regional producers.

The broadest research on both consumers and producers was conducted by Ostrom and Jussaume

(2007) in Washington state in 2002 on direct marketing. Farms of all sizes used direct marketing to diversify their marketing mix to reduce risk associated with wholesale markets. However, direct markets were used primarily for fresh produce and had not developed for livestock and grains, particularly in the arid eastern part of the state. Practical considerations such as proximity to urban markets made direct marketing an opportunistic rather than intentional approach for many producers. Consumers also expressed practical goals, motivated by quality, taste, nutrition, and convenience rather than by environmental or community goals; as a result, they were mostly interested in obtaining local fresh produce. From these practical considerations, public benefits may develop in the future, such as articulating the ability of direct marketing to keep local farmers on the land. This research provides a historical baseline for understanding producer and consumer interests in direct marketing in Washington and the Pacific Northwest. It can help us to understand some of the institutional and market shifts in recent years, such as government support for direct marketing strategies and the increase in farmers markets and other alternative food marketing (Ostrom & Jussaume, 2012).

Applied Research Methods

Two separate surveys were distributed in 2016 using mixed-mode convenience sampling, one to Oregon producers and one to consumers (Bernard, 2011). The producer survey was intended to gather responses from producers active in the Oregon RFN. As there is no definitive list of RFN producers, we distributed the survey via avenues where RFN producers congregate: the Oregon State University Small Farms Conference in Corvallis, Oregon, and farmers market vendors in different parts of the state (postage-paid return envelopes and the online version were provided simultaneously). A broader distribution occurred online via email and social media through several different farm organizations, including the Oregon Department of Agriculture. Because the consumer survey was intended to reach consumers from all parts of the state, it was distributed via email listservs and newsletters of several county economic development offices throughout the state (to reach a large

geographic area) and on social media through food and farm organizations, and paper copies were distributed in-person and through county economic development offices in eastern Oregon to ensure coverage of rural areas.

A total of 193 producer survey responses and 614 consumer survey responses were recorded; however, when respondents were not from Oregon or did not answer every question their data was dropped from analysis where appropriate. Data from both surveys were analyzed using correlation analysis and Pearson's chi-squared test for independence. Because many of our survey questions allowed multiple responses ("check all that apply"), we applied the Pearson's chi-squared test pairwise for all possible responses to multiple-by-multiple response questions and for each multiple-response option in single-by-multiple response analysis, to avoid problems of within-subject dependence among responses (Agresti & Liu, 1999; Bilder & Loughin, 2004).

Results

Producer Survey

Because this was a convenience sample, intended to obtain information from Oregon RFN producers, the respondents differ from the general Oregon farm population in some ways, which provides a window into the RFN sector. It is important to keep in mind that the data reflects only producers that were motivated to participate in an RFN study. Demographically, respondent age distribution was more even than the population of Oregon operators: 19 percent under the age of 35 (compared to 4 percent of all operators), 34 percent between 35 and 54, 30 percent from 55 to 64, and 16 percent 65 or older (the average age of all Oregon operators is 60) (USDA NASS, 2014a). Most respondents held college degrees (61%) or had at least some college education (12%). Gender was roughly equal (46% female), which is more like direct farm marketers than the general farm operator population (20 percent of principal operators are female), and 97% identified as White, close to the state farm operator population (Oregon Department of Agriculture, 2016; USDA NASS, 2014a). Most respondents were new and beginning

farmers, with 60 percent operating for less than 10 years, which differs significantly from the general farm population, with only 24 percent on their farm for less than 10 years (USDA NASS, 2014a, 2014b). Therefore, our sample was younger, had less farming experience, were more likely to be female, and had a high level of educational attainment.

Most farms (51%) were in the central Willamette Valley and north-central coast, 23 percent in the Portland area, 7 percent in the southwest, 10 percent in the central region, and 6 percent in the eastern region (Figure 1). For our analysis we aggregate the Willamette Valley and Portland areas, which have a similar growing season and where the concentrated urban areas are located. We also aggregate the more rural regions in southwestern, central, and eastern Oregon, which are more sparsely populated with smaller population centers and are dominated by forest or the more arid climate east of the Cascades mountain range. The differences in growing region and population in the Willamette Valley (WV) versus the rest of the state (NWV) may provide a significantly different environment for the operation of the Oregon RFN.

Farm Characteristics

Measuring farm size by gross farm income, respondents had a more even distribution over income

categories than the overall farm population (Table 1). Our respondents skew to higher income categories, possibly due to the number of active small commercial farms responding to our survey, whereas the Census of Agriculture gathers data from all farms, including “point farms” that are not farming but that are capable of generating at least US\$1,000 in farm income per year (Hoppe, 2014).

Many of our respondents reported negative farm net income, while some netted over US\$100,000 in 2015. On average, 39.6 percent of respondent household income came from the farm or ranch, with a median of 25 percent, ranging from none to 100 percent. The number of acres (owned and leased) in respondent operations ranged from 0.02 acres to 60,000 acres. Approximately 61 percent of our respondents operated under 50 acres; about half of those were under 10 acres (Table 2). Our survey population is fairly similar to the population of Oregon farms and ranches in terms of acres, although we captured a slightly higher proportion of the larger acreage farms. Combining the farm size data, our respondent farm acreage is very similar to the total farm acreage of Oregon, while respondent gross farm income skews higher. Considering differences between the Willamette Valley and other parts of the state, the non-Willamette Valley producers reported higher acreage and average farm income than the Willamette Valley producers.

Figure 1. Proportion of Respondents in Each Region of Oregon

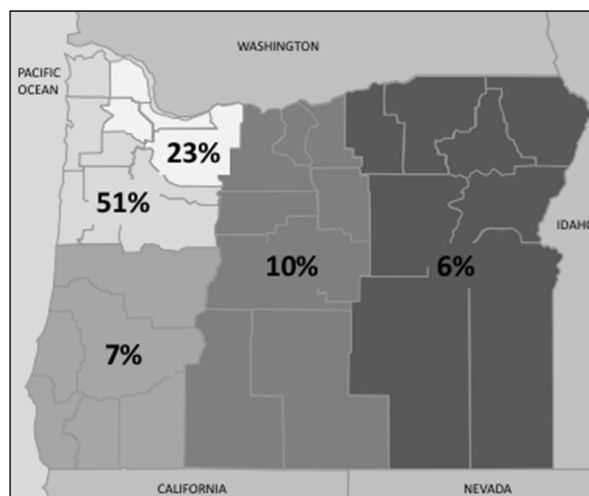


Table 1. Comparison of Surveyed Farms vs. All Oregon Farms' Size by Gross Farm Income (all income in US\$)

Gross Farm Income	% of survey respondents (n=101 farms)	% of all Oregon farms ^a (n=35,439)
Under \$2,500	6.9%	37.9%
\$2,500–\$9,999	14.8%	25.0%
\$10,000–\$24,999	19.8%	11.9%
\$25,000–\$99,999	23.8%	11.8%
\$100,000–\$249,999	9.9%	5.1%
\$250,000–\$499,999	9.9%	3.1%
\$500,000 or more	14.8%	5.2%

^a Source: 2012 Census of Agriculture (USDA NASS, 2014a, Tables 64 and 66).

Table 2. Comparison of Surveyed Farms vs. All Oregon Farms' Size by Acres

Farm Size (acres)	% of survey respondents (n=155 farms)	% of all Oregon farms ^a (n=35,439)
0.02–9	29.0%	25.7%
10–49	32.2%	35.7%
50–99	10.9%	11.5%
100–219	10.9%	10.0%
220–999	7.6%	10.3%
Over 1000	9%	6.7%

Note: 1 acre=0.4 hectare

^a Source: 2012 Census of Agriculture (USDA NASS, 2014a, Tables 64 and 66).

Farm and Ranch Production Practices

Survey respondents indicated products raised on their farm from among 18 categories. There was diversity in production among and within farms, with an average of 3.2 products per farm. Only 26 percent of farms chose just one category, and 16 percent produce six or more categories with a maximum of nine product categories. Of those that raised animals, 70 percent produced both plant and animal products. Of those that produced animal products, 45.5 percent produced two or more different animal products, and 15 percent produced four or more animal products.

Regarding production practices, 28.2 percent used conventional methods, 13.4 percent reported certified organic production and 59 percent used organic practices but were not certified. Beyond the conventional/organic categories, 52.3 percent used other alternative methods: conservation tillage or no-till, cover crops, integrated pest management (IPM), and nutrient management plans. Of those that raise animals, 93.2 percent reported free-range methods, 61.4 percent used antibiotic- and hormone-free production, and 71.6 percent used grass- or organic-fed.

When asked about the reasons for choosing their production practices, 80 percent selected “alignment with my environmental values.”

Eighteen percent took the opportunity to write in other motivations, many of which offered specific ethical, religious, and political values, or specific environmental concerns. In addition to values, 32 percent chose “more profitable,” 29 percent chose “local or regional support and infrastructure,” and 25 percent chose “access to established markets.”

While certified organic production and other conservation practices were not correlated with any motivation, those using organic practices without certification were positively correlated with the “alignment with my environmental values” motivation ($r=0.37^{****}$).¹ Those identifying their practices as “conventional” were negatively correlated ($r=0.5^{****}$) with the “alignment with my environmental values” motivation and were positively correlated ($r=0.25^{***}$) with the “more profitable” motivation.

We grouped the various production practices into two general categories, conventional and alternative (those that chose any additional environmental or animal husbandry practice). While there were no significant differences in conventional and alternative practices by region of Oregon or age, we found that those who have been farming less than 10 years were significantly more likely to choose alternative production practices ($\chi^2=17.9^{****}$). Furthermore, farmers of all production practices most often rely on other farmers for advice, training, education, and technical support (>96% in all categories), indicating that farmer information-sharing networks could be contributing to the spread of practices among different types of farmers.

Marketing Practices

Farmers indicated their marketing practices by reporting the percent of 2015 gross farm income derived from the following channels: agritourism (e.g., U-pick, farm stay), direct sales to consumers (e.g., farmers markets, CSAs), sales to local retailers or restaurants, sales to local or regional institutions (e.g., hospitals, schools), sales to local or regional distributors who brand the products as locally and regionally produced, and sales to national and

¹ Throughout, we report statistical significance at $p<0.1^*$, $p<0.05^{**}$, $p<0.01^{***}$, $p<0.001^{****}$.

international distributors (commodity markets).

Marketing channels both among and within farms were highly diverse. While the average farm used two marketing channels, 35 percent used only one marketing channel and two farms used five marketing channels. As Table 3 illustrates, those that used either direct-to-consumer or national/international distributors derived most of their gross farm income from those channels, showing some specialization with those categories. Of the direct-to-consumer farms, 30 percent used only direct marketing, and of those that used national and international distributors, 36 percent used only that marketing channel. The other categories of local and regional sales to retail, restaurants, and institutions account for less than 30 percent of gross farm income, with few relying on those channels for their full farm income. Local and regional distributors seem to be a more robust channel, although fewer farms used them. Agri-tourism seems to be a supplemental income source, with only 19 percent of average gross farm income coming from agritourism and no one reporting 100 percent reliance on that channel.

It is also evident that different products fit different marketing channels (Appendix A, Table A1). Grain production was significantly correlated with national and international distribution ($r=0.54^{***}$), but negatively correlated with direct-to-consumer ($r=-0.40^{***}$). Vegetable production shows the reverse, with a significant positive correlation with direct-to-consumer ($r=0.17^*$) and local retail and restaurant distribution ($r=0.40^{***}$), and a negative correlation with national and international distribution ($r=-0.17^*$).

Production practices also have strong relationships to marketing channels (Appendix A, Table A1). Direct-to-consumer sales are negatively correlated with conventional practices ($r=-0.37^{***}$), but positively correlated with noncertified organic practices ($r=0.26^{***}$), grazing/free range ($r=0.27^{**}$), and antibiotic and hormone-free practices ($r=0.25^*$). Certified organic production is positively correlated with sales to local retail or restaurants ($r=0.27^{**}$) and local/regional distributors ($r=0.20^{**}$), probably because they require the certification label for marketing and a price premium. Conversely, sales to national and/or international distributors are positively correlated with conventional practices ($r=0.47^{***}$), but negatively correlated with organic practices ($r=-0.26^{***}$), grazing/free range ($r=-0.21^*$), and antibiotic/hormone-free practices ($r=0.29^{**}$).

Considering farm size, the farms with very small acreage and low income engage in direct channels, with significant positive correlations for less than ten acres for direct-to-consumer ($r=0.22^{**}$), while 80 percent of the farms that use direct sales are in the bottom two income categories (up to US\$250,000, half of which gross less than US\$25,000), and have a significant negative correlation with national and/or international distribution channels. The highest income category, over US\$500,000 gross farm income, was significantly correlated with both local and regional distributors ($r=0.34^{***}$) and national distributors ($r=0.47^{***}$). The highest income category was negatively correlated with direct-to-consumer marketing ($r=-0.36^{***}$), consistent with findings

Table 3. Contribution of Marketing Channels to Gross Farm Income (GFI)

	Agritourism	Direct to Consumers	Local Retail and/or Restaurants	Local/Regional Institutions	Local/Regional Distributor	National and/or International Distributor
% of respondents using channel	14.2%	85.0%	54.0%	9.7%	25.7%	9.7%
Average % of GFI derived from channel	19%	72.6%	24%	28.4%	45%	67.8%
Minimum % of GFI derived from channel	0.1%	1%	0.05%	1%	3%	10%
Maximum % of GFI derived from channel	80%	100%	100%	100%	100%	100%
% using maximum % of GFI derived from channel	6.3%	30.2%	3.3%	9.1%	10.3%	36.4%

that smaller farms are taking advantage of direct markets (Martinez et al., 2010). Local and regional retail and restaurant sales are associated with small to midsize farms, positively correlated with farms grossing US\$25,000 to US\$249,000 per year ($r=0.19^*$) and 50 to 219 acres ($r=0.20^{**}$). We found no significant differences between the Willamette Valley and other parts of the state in marketing channel use.

Just as farmers who have been operating for less than 10 years are using more alternative farming practices, they also have higher rates of local and regional marketing channel use, with a significant positive correlation with direct marketing ($r=0.28^{***}$), and a negative correlation with national and international distributors ($r=-0.30^{***}$). Established farmers operating more than 10 years have a positive correlation with use of distributors, which is statistically significant for national and international markets ($r=0.30^{***}$). However, farmer age does not show significant differences in use of marketing channels. The fact that older farmers are using direct marketing could reflect the rise in “retirement” farms on small acreage with low farm sales, which can also be beginning farms (Brekken, Gwin, Horst, McAdams, Martin, & Stephenson, 2016).

Marketing Motivations and Barriers

The producer survey asked respondents to indicate their motivations and barriers for each local and regional marketing channel (agritourism, direct to consumer, local retailers and restaurants, local/regional institutions, and local/regional distributors). We analyzed the results with respect to reported gross farm income as a measure of farm size.

We specified nine motivations for local and regional marketing: “increase farm revenue,” “promote farm’s connections with customers/community,” “promote locally made products,” “diversify farm operation/revenue sources,” “provide employment opportunities,” “enhance local economy,” “support local/regional health and food security,” “provide educational channel for others,” “lifestyle choice for me and my family.” All motivations had some statistically significant correlation between marketing channel and gross

farm income. We also asked about 12 barriers to using each RFN marketing channel; eight had some significant correlation to an income category and marketing channel: “family or operation does not fit market,” “not profitable,” “handling or food safety costs,” “labor costs,” “lack of demand,” “lack of market supply-chain partners,” “lack of training,” and “lack of networks and support systems.” Four other categories were not significantly correlated with any marketing channel or income category: “time constraints,” “lack of capital,” “transportation costs,” “poor coordination,” and “inconsistent payment.” Appendix A, Table A2 condenses results for each motivation and barrier, omitting barriers with no significant correlations.

Overall, “increase farm revenue” was the highest motivator, followed closely by motivations that were public in nature, “connecting to community” and “promoting locally made products,” with similar motivations in all parts of the state (see Appendix A, Table A2). The NWV producers were more motivated by “support local health/food security,” which is consistent with the fact that food security is a prominent issue in rural Oregon, with loss of rural grocery stores and lack of access to fresh foods (Oregon Food Bank, 2016).

Although no one barrier was selected by more than 50 percent of the respondents, “family or operation doesn’t fit market” was ranked first and “time constraints” second; both rankings are understandable, as no one marketing channel will fit all types of farms (see Appendix A, Table A2). The “not profitable” barrier was rated significantly higher in the Willamette Valley than elsewhere, the only barrier that was significantly different by location. Willamette Valley RFN producers may struggle with profitability due to the barriers that they indicated in food safety and labor costs, which were ranked higher there than in other parts of the state. For rank order by location, RFN producers outside of the Willamette Valley were more focused on finding consumers, ranking “lack of demand” fourth, while in the Willamette Valley it was ranked seventh. Outside of the Willamette Valley, “not profitable” was ranked fifth, tied with transportation costs and labor costs. Although the differences were not statistically significant, their

differences in relative importance could provide insight into the barriers that producers face in different parts of the state.

We also analyzed each motivation with respect to marketing channel and farm size as measured by gross farm income, to gain more detailed insights into the motivations and barriers of farms based on scale. For the smallest farms (<US\$25,000), “lifestyle choice” for direct-to-consumer marketing was the only motivation with a significant positive correlation ($r=0.20^*$). They identified “family or operation doesn’t fit market” as a barrier for local/regional institutions and distributors ($r=0.24^*$, $r=0.21^*$), and “lack of training” as a barrier to agritourism ($r=0.30^{**}$).

For small to midsize farms (US\$25,000–US\$250,000), agritourism was motivated by increasing farm revenue ($r=0.26^*$), promoting connection to community ($r=0.25^*$), and diversifying the farm operation ($r=0.27^*$). Direct-to-consumer marketing was motivated by supporting local/regional health and food security ($r=0.30^{***}$) and providing educational opportunities ($r=0.21^*$). This group also engages in sales to local retail and restaurants to diversify farm marketing ($r=0.22^*$). The only positive significant barrier for sales to local and/or regional distributors was handling or food safety costs ($r=0.24^*$).

For midsize farms (US\$250,000–US\$500,000), agritourism and direct sales were motivated by providing employment (agritourism $r=0.27^*$, direct $r=0.19^*$) and supporting local health and food security (agritourism $r=0.31^{**}$, direct $r=0.21^*$), while direct sales were also motivated by enhancing the local economy ($r=0.24^{**}$). Promoting connection to community ($r=0.23^*$) and supporting health and food security ($r=0.22^*$) were motivations for selling to local retail and/or restaurants. Higher-volume sales to local and/or regional retail and restaurants ($r=0.24^*$), institutions ($r=0.28^{**}$), and distributors ($r=0.23^*$) were inhibited by the “not profitable” barrier, and lack of market supply-chain partners was a barrier to direct sales ($r=0.30^{**}$) and sales to local retail and restaurants ($r=0.37^{***}$). These channels do not require supply-chain partners per se, but may be an indicator that a farmers market, food hub, or other intermediary is not available, or that retailers and restaurants are not

receptive to local products.

The largest farms (>US\$500,000) had the most statistically significant motivators for local and regional sales. Providing employment motivated agritourism ($r=0.30^{**}$) and direct sales ($r=0.22^{**}$), while agritourism was also motivated by providing educational opportunities ($r=0.24^*$). Sales to local and regional institutions and distributors were motivated by diversifying farm revenue (institutions $r=0.31^{**}$, distributors $r=0.39^{***}$), providing employment (institutions $r=0.41^{***}$, distributors $r=0.31^{**}$), and as a lifestyle choice (institutions $r=0.38^{***}$, distributors $r=0.43^{***}$); additionally, sales to institutions were motivated by increased farm revenue ($r=0.28^{**}$), promoting locally made products ($r=0.33^{**}$), and enhancing the local economy ($r=0.33^{**}$). As we would expect, for both the direct marketing and local retail or restaurant channels their barriers were related to the smaller-volume marketing channels, “the family or operation doesn’t fit the market” (direct $r=0.42^{***}$, retail/restaurant $r=0.36^{***}$) and “lack of demand” (direct $r=0.22^*$, retail/restaurant $r=0.24^*$), while handling or food safety costs were a barrier to direct sales ($r=0.25^{**}$) and high labor costs were a significant barrier to local retail or restaurants ($r=0.21^*$).

Consumer Survey

A total of 617 responses were recorded from consumers living in 20 Oregon counties (out of 36) as well as some outside of Oregon. The convenience sampling method limits the general applicability of our results; although we attempted to sample a broad geographic range in Oregon and did not target consumers with a specific interest in RFN foods, the consumers who chose to complete the survey may be motivated by an intrinsic interest in local foods. Even so, it is valuable to understand the motivations of those consumers who are seeking out local foods to connect them more effectively to producers in the Oregon RFN.

The sample was 70 percent female, and most respondents had completed some college or held a college degree (63%), followed by those who held a post-college/graduate degree (30%). Annual income was rather evenly distributed, with 25 percent earning less than \$25,000 per year, 23 percent

earning between \$25,000 and \$50,000, 32 percent between \$50,000 and \$100,000, and 20 percent earning more than \$100,000 per year. The age of respondents ranged from 18 to 81.

Attitudes Toward Local and Regional Food

For the definition of “local” food, 32 percent considered food from within the state to be “local,” 20 percent said within 100 miles (161 km) of the consumer, 27 percent said within 50 miles (80 km), and 14 percent said within 25 miles (40 km). There was no statistically significant difference between consumers in the Willamette Valley region and other parts of the state in their definition of local.

Most respondents typically buy groceries from a supermarket chain (83.9%) or a locally owned grocery store (60.2%), shopping weekly to once per month. The third most frequent venue was a farmers market (35.1%) and fourth was food co-ops (33.4%), each varying by location and season. When shopping for groceries, 52.2 percent of respondents always or usually check where the product was made or grown. When buying fresh foods, “locally produced” was considered “important” or “somewhat important” (81.3%), essentially equal to price (81.8%) and convenience (79.5%), two main food choice drivers, while regional

brands were considered important for 42 percent of respondents, and national brand important for only 12.3 percent (Table 4).

Most respondents (74%) were willing to pay a premium of either 10 or 25 percent above typical price to obtain local foods. People with higher education levels ($\chi^2 p=0.00****$), who had visited a farm in the previous year ($\chi^2 p=0.00****$), females ($\chi^2 p=0.01**$), those who had higher annual income ($\chi^2 p=0.03**$), those who cook more at home ($\chi^2 p=0.04**$), and those who spend more on groceries ($\chi^2 p=0.05**$) were willing to pay more for local or regional food. Those aged 30–49 were more likely to be willing to pay 25 percent above typical price (41.4%), while every other age group preferred a 10 percent price premium (~40% for each age group) ($\chi^2 p=0.10*$) (Appendix B, Table B2).

When asked their motivations for purchasing local food, 81 percent indicated “support local farmers” (Table 5). The next top response was “tastes better,” at 48 percent. Public motivations were next, with “environmental concerns” at 45 percent, “promote local food” at 42 percent, and “preserve agricultural landscapes” at 39 percent. Twenty-six percent felt that local or regional food is “safer to buy.” Given the opportunity to write in

Table 4. “Most Important” and “Important” When Shopping for Nonprocessed Food

Product Attribute	Percent	Rank	Non-Willamette Valley (n=93)	Willamette Valley (n=320)	Difference	χ^2 p-value
Freshness of the products	97.3%	1	97.8%	97.8%	0.0%	0.44
What my family usually eats	85.5%	2	89.2%	84.1%	5.2%	0.34
Variety of the products	82.8%	3	83.9%	81.9%	2.0%	0.70
Price	81.8%	4	83.9%	82.8%	1.1%	0.62
Locally produced	81.3%	5	71.0%	81.6%	-10.6%	0.03**
Convenience of the location	79.5%	6	77.4%	77.8%	-0.4%	0.68
Quality and appearance of the packaging	61.0%	7	59.1%	60.3%	-1.2%	0.73
Non-genetically modified	58.8%	8	48.4%	55.0%	-6.6%	0.32
Operation hours of the stores	58.1%	9	58.1%	55.9%	2.1%	0.80
Organic	52.8%	10	33.3%	52.2%	-18.9%	9.53E-04****
Regional brand	41.7%	11	26.9%	44.1%	-17.2%	0.002***
Name of the store	17.4%	12	12.9%	17.8%	-4.9%	0.26
National brand	12.3%	13	10.8%	12.8%	-2.1%	0.58

other motivations, nine percent noted reasons such as fresher, ripper, longer lasting, and (sometimes) cheaper; personal knowledge of production practices (non-GMO and others); transportation costs; supporting the local economy; and access issues, such as lack of nearby grocery stores.

Examining more closely perceptions of food purchased at farmers markets as a specific example of local food, most said that farmers market food is higher in quality (76%) and environmentally sustainable (65%), but noted that the price was also higher (56%). Thirty-four percent said that food from a farmers market was safer, while 35 percent said it was equal in safety to food bought at a supermarket.

Environmental Concerns

Concern about environmental impacts was the third-ranked reason for buying local foods, expressed by 45 percent of respondents. However, consumers showed significant variation in this motivation. Women, those with college education, those over the age of 30, middle-income categories (US\$25,000–US\$50,000 per year), and those who cook more at home were also more likely to be motivated by environmental concerns (Appendix B, Table B1). The environmental motivation was more strongly felt in the Willamette Valley, where 51 percent indicated environmental motivations versus 28 percent of NWV respondents (Table 5). Of those that were willing to pay at least 50 percent over typical prices for local foods, 78 percent were motivated by environmental concerns, ranked third behind “support local farmers” and “promote local food.” A majority of the respondents (55%) willing to pay a 25 percent price premium was also motivated by environmental concerns, indicating that a belief that local foods have environmentally sensitive production may contribute to greater willingness to pay for local foods.

Regional Differences

Some interesting differences emerged between consumers in the Willamette Valley and those in more rural areas of Oregon. Demographically, our survey respondents from the Willamette Valley were younger and more evenly distributed over income categories. Outside the Willamette Valley,

the respondents were older ($\chi^2 p=0.00****$) and fell into middle-income categories between US\$25,000 to US\$100,000 per year ($\chi^2 p=0.02**$). (See Appendix B, Table B3.)

While there was no statistical difference between the regions in their definition of local (the highest choice in each region was “within my state”), those in the Willamette Valley were willing to pay more for local and regional food (Appendix B, Table B3). While a 10–25 percent price premium was the most popular answer for both regions, 33.7 percent of the non-Willamette Valley group was willing to pay equal to or less than the typical price, compared to 18.3 percent in the Willamette Valley.

The places where the respondents frequently shop (“at least once a week” and “every few weeks to a month”) for groceries varied by region. Willamette Valley shoppers were statistically more likely to shop at supermarket chain stores ($\chi^2 p=0.03**$) and food coops ($\chi^2 p=0.00****$) while non-Willamette Valley residents shopped at locally owned grocery stores ($\chi^2 p=0.01***$). Other food outlets such as convenience stores, farmers markets, farm stands, and CSAs did not differ significantly between the regions. When shopping for nonprocessed food, regardless of venue, more Willamette Valley respondents rated as important locally produced food ($\chi^2 p=0.03**$), regional brands ($\chi^2 p=0.00***$), and organic ($\chi^2 p=0.00****$) (Table 4).

The motivations for buying local and/or regional food also varied significantly by region, except for “safer to buy” (Table 5). Of note, “promote local food” was the one motivation that was significantly higher outside of the Willamette Valley. As expected from the “organic” importance in shopping for nonprocessed foods, environmental concerns were the most significant difference between the two regions, with the Willamette Valley residents having much higher environmental motivations.

Discussion

Producers and consumers must meet in the marketplace to create opportunities to enhance and expand Oregon’s RFN. USDA’s “Know Your Farmer, Know Your Food” initiative (Low et al.,

Table 5. Consumer Motivations for Buying Local/Regional Food, Ranked and by Region

Reasons to Buy Local/Regional	Total % (ranked)	Non-Willamette Valley (N=96)	Willamette Valley (N=323)	Difference	Chi ² p-value
Support local farmers (N=341)	81.4%	71.9%	84.2%	-12.3%	0.006***
Tastes better (N=200)	47.7%	36.5%	51.1%	-14.6%	0.01**
Environmental concerns (N=190)	45.3%	28.1%	50.5%	-22.4%	0.00****
Promote local food (N=174)	41.5%	53.1%	38.1%	15.0%	0.02**
Preserve agricultural landscapes (N=164)	39.1%	27.1%	42.7%	-15.6%	0.006***
Safer to buy (N=108)	25.8%	22.9%	26.6%	-3.7%	0.47

2015) can be interpreted as a personal endeavor by consumers to seek out their local producers. Likewise, producers can “know their customer” through direct marketing channels, but to understand how to connect to more consumers and access other types of markets, producers need to understand the community of shoppers and potential supply-chain partners. To further develop the RFN, supply-chain partners and policymakers need to understand the characteristics and the motivations and barriers of various RFN markets to facilitate producer and consumer participation in the regional food system.

The “who, what, how, and why” of local food marketing can be discovered by analyzing producer and consumer surveys side by side. Digging more deeply into the “why,” we find economic, social, and environmental motivations that could contribute to greater integration of food system actors within the RFN. If producer and consumer motivations are aligned, this could suggest more places to meet in the marketplace and in other public realms that influence the food system. Understanding motivations and opportunities could, in turn, indicate long-term economic, social, and environmental outcomes for the communities in which local and regional food networks are embedded.

Who Is Using Local and Regional Marketing Channels?

Although both our producer and consumer surveys were gathered with convenience sampling, we saw significant variation in the data for subsets of respondents, with our results resembling other producer and consumer surveys conducted in other

parts of the country. Producers diversify their product types and marketing channels, and a majority were motivated to participate in the RFN to “diversify farm operation” (64%). Small operations tend to use direct marketing channels, while large operations use distributors, and there is specialization in those channels, with over 30 percent of those producers who use each of the channels using it exclusively.

We found some strong differences between beginning farmers and established farmers. Beginning farmers were significantly more likely to use direct marketing, while established producers used national and international distributors. Beginning farmers were also more likely to use environmentally sensitive production practices, which is also correlated with direct marketing channels. Of note, this distinction is with length of time farming, but is not correlated with age; people come into farming at all ages and make their own choices when beginning an operation. Our survey captured a far greater proportion of new and beginning farmers than is present in the Oregon farm population, giving an interesting window into that demographic. As Oregon farm operations transition to new owners, beginning farmers could benefit from networks and supports that target their production and marketing interests.

The consumer demographics also resemble those of some other studies, showing that people with higher income and education, who spend more on groceries, are over 30, females, those who cook more at home, and those in the Willamette Valley are willing to pay more for local and regional food, most strongly 10-25 percent above typical prices.

Which Products and How Are They Moving in Local and Regional Markets?

As in the Ostrom and Jussaume (2007) study of Washington state producers in 2002, grain producers tend to sell into national or international distribution channels, and fresh produce is popular in direct markets. In addition, we found significant sales of fresh produce to local retail and restaurant outlets, and positive but insignificant correlations with sales to local and regional institutions. No strong results were found for animal products; there could be barriers in the processing and distribution for animal products that we did not probe.

Production practices are another characteristic of food that moves through the market. We found strong correlations between direct sales and organic practices (but not certified), grazing/free range, and antibiotic- and hormone-free. Certified organic produce is correlated with RFN retail and wholesale channels, while sales to national and/or international distributors are correlated with conventional practices. The motivation for choosing specific practices is certainly related to the experience of the farmer, scale of operations, types of products, and requirements of supply-chain partners. But with the strong connection between non-certified organic practices and direct marketing, the strongest motivation seems to be personal environmental values. It is likely that the production practices are chosen, and then the direct marketing channel provides the opportunity to use organic practices while receiving a price premium for noncertified organically-grown products.

The connection between fresh and local is well established in Oregon: 81 percent of consumers rated “locally produced” as important when buying fresh food, rated essentially equal to price and convenience, two main food choice drivers. When shopping for groceries in general, most respondents always or usually check where the product was made or grown, and 42% look for regional brands, although that preference was stronger in the Willamette Valley. Thus, there could be unmet demand for local or regional food in grocery stores, presenting an opportunity for producers and their supply-chain partners.

Over half of our respondents already sell to

local retail or restaurant outlets, although on average they get only 24 percent of their gross farm income from those channels, indicating that barriers may keep them from fully utilizing this market. Midsized farms (farm income of US\$250,000–US\$500,000 in our sample) would likely have enough volume to move through the midsized RFN marketing channels: retail, restaurants, institutions, and distributors that retain place of origin labeling. However, those farms indicated that those marketing channels are “not profitable,” and for local retail and restaurant sales in particular they found barriers in handling or food safety costs, lacking market supply-chain partners, and lacking networks and support. The fact that these barriers to local retail and restaurant sales were significant for midsize farms could indicate the desire to use those channels, but difficulty in matching motivations and price premiums with the wholesale supply-chain partners, as previous research has indicated. This is an area of opportunity that could be explored to satisfy consumer desire for local and regional food and to bolster Oregon’s midsized farms. Addressing the barriers by finding willing supply-chain partners, networks, and support—or establishing them where they do not exist—could assist with food safety requirements, enhance marketing to capture the price premium, equitably distribute the price premium among producers and supply-chain partners, and ultimately make those market channels profitable if consumer willingness to pay is realized.

Consumer respondents overall did not indicate strong environmental motivations for purchasing local or regional food, but some types of consumers were much more motivated than others, such as middle-income and middle-age categories, women, those with higher education, and those who cook more at home. Consumers in the Willamette Valley were most motivated by environmental concerns and also placed a significantly higher value on organic certification when shopping for nonprocessed food than consumers in other parts of the state. Producers who can communicate the environmental attributes of their practices may benefit from catching the eye of this type of consumer, even though it may not be motivating for everyone. Some producers also

indicated strong internal motivation for using environmental practices, so it may be a matter of communicating those values and actions, rather than investing in organic certification.

Communicating environmental and other values is easier in a direct marketing setting, and we see a strong relationship between environmental practices and direct marketing. The challenge is to take it to other types of marketing settings; we found that 79 percent of consumers are doing most of their shopping at supermarket chains, particularly in the Willamette Valley, and 59 percent are shopping at locally owned grocery stores, especially in rural parts of the state. Selling to locally owned retailers could be a new frontier for some producers, if they can overcome some of the barriers to retail sales. Outside the Willamette Valley, producers are particularly motivated by enhancing health and food security in their communities where food security is a problem that has unique and urgent characteristics in rural areas. If retailers understand that the consumers in their area are motivated to buy local foods and will pay a premium for them, they too may be motivated to make them available. The food system will take the shape of the motivations expressed by producers and consumers if supply-chain partners are willing to work with the producers and communicate with consumers.

Why Engage in Local and Regional Food Markets? Motivations and Barriers

Looking at producer motivations for local and regional marketing, we see a mix of personal and/or business motivations and public motivations. Overall, “increase farm revenue” was the highest motivator; then the next two personal or business motivators were “lifestyle choice” (rank 4) and “diversify farm operation” (rank 5), chosen equally by producers within and beyond the Willamette Valley. Public motivators came in second and third, with “promoting connection to community” and “promoting locally made,” at nearly 80 percent agreement in all areas of Oregon.

Consumer motivations for buying local were highly public and altruistic, with “support local farmers” on top, followed by a personal motivator, “tastes better.” The strong motivations were

corroborated by the importance of “locally produced” when buying fresh food, on par with price and convenience. Consumers were generally willing to pay 10–25 percent more for local and regional food. There is evidence to support that there is good alignment in understanding the purported benefits of local food and motivations on each side of the market transaction, with support for farmers given the highest priority.

Environmentally related motivations and production practices are a more nuanced case, with most producers (80%) indicating “aligns with my environmental values” as the top motivator for production practices, highly correlated with their choice of environmentally sensitive methods, local and regional marketing, and with farmers having less than 10 years of experience. This suggests that farmers choose their environmental practices and then find marketing channels that will fit their operation personally and economically. The “access to established markets” motivation was significantly positive for conventional production and weakly positive for certified organic, but negative for noncertified organic practices, indicating that there may be difficulty in finding supply-chain partners for noncertified organic producers, which may lead them to turn to direct marketing to communicate their values. Farmers may also choose their marketing for personal reasons, as we found that “lifestyle choice” was the fourth-ranked motivator for choice of marketing channels, equally chosen in different regions of Oregon and across different farm sizes.

Producers did not signal that barriers to local and regional marketing are uniform or insurmountable, as no one barrier was chosen by more than 50 percent of all respondents. But some subcategories of barriers are felt more strongly based on the location or the size of the operation. “Doesn’t fit my operation” is the highest barrier, as there is no “one size fits all” ideal marketing channel. The goal in an RFN is to have a range of marketing channels to fit the range of producers and consumers, depending on location, income, and other salient factors.

For producers, the “not profitable” barrier was rated significantly higher in the Willamette Valley than elsewhere, the only barrier that was

significantly different by location. This is somewhat surprising, given that Willamette Valley consumers are in closer proximity to local and regional food and are also willing to pay more for it by a significant margin. The price of land or other inputs could be higher in the Willamette Valley due to local conditions, types of cropping practices, and labor costs. As discussed previously, missing connections and other barriers in the supply chain could be the bottleneck for some RFN marketing channels, particularly for midsized farms. More research on specific barriers in different regions would be helpful in analyzing the reasons that RFN marketing channels are perceived as unprofitable in the Willamette Valley.

RFN producers outside the Willamette Valley were more focused on finding consumers, ranking “lack of demand” fourth, while in the Willamette Valley it was ranked seventh. However, 71 percent of consumers in NWV areas rated “locally produced” as “most important or important” when buying fresh foods, while “support local farmers” (71.9%) and “promote local food” (53.1%) were their top two reasons for buying local, and 63.1 percent were willing to pay 10-25 percent higher prices for local food, which over half defined as “within 100 miles” or “within my state.” Because this is a convenience, nonrepresentative sample, we cannot estimate the total demand for Oregon-produced food. But the robust motivations expressed by our respondents is evidence that there is a segment of the population motivated to participate in the Oregon RFN in urban and rural parts of Oregon, if barriers can be overcome to make it available.

Conclusions

Oregon producers and consumers have a strong interest in local agriculture as reflected in the culture of local foods in Oregon, and which is also reflected in our survey results. We see opportunities to move more food in the RFN through wholesale channels, such as retail, institutions, and distributors that differentiate products based on place of origin. The consumer interest in Oregon-produced food indicates possibilities for producers to engage with more value-added processing to expand product lines, generating more economic

in-state benefits from the RFN (Sorte & Rahe, 2015).

For those working with beginning farmers or small to midsize producers looking to enhance their participation in the RFN, it is important to recognize that those producers are motivated by their personal values, mediated by the characteristics of their farm. Knowing the consumer demand for their products throughout the state and exploring all opportunities could reveal some market opportunities to connect with consumers that are hungry for their products, rather than changing practices to follow consumer demands.


However, consumer demand is also mediated by supply-chain partners. Organic certification seems important for local restaurant and retail outlets and for distributors, particularly if the products are going to Willamette Valley markets. While we found that many direct-market farms are using organic practices while forgoing certification, farmers who want to scale up into RFN wholesale channels will have to become certified, but may need assistance with the costs of certification and transition, which could come from their supply-chain partners or public policy.

Alternatively, the Oregon consumers who responded to the survey are interested in local and regional food, while environmental concerns are strong for only a subset of consumers. While the organic certification is accepted by consumers, wholesale supply-chain partners could shift from certified organic products to Oregon or Pacific Northwest sourcing and invest in “telling the story” of the food to appeal to a broader customer base. Remaining questions are whether consumers will exercise their willingness to pay, if the price premiums will be enough to cover additional costs, and whether price premiums will be equitably distributed to the producers to realize the economic benefits of their efforts at RFN marketing.

Further research illuminating some unanswered questions from this general survey could be targeted at specific types of production, such as RFN marketing of animal products and/or grains. Given that eastern Oregon is suited to grain and animal production, there could be opportunities for moving more of those products through RFN channels, but there are special considerations given

the complexities of those supply chains. More research into variation by location could also be fruitful, understanding the cost differences between different parts of the state and targeting assistance as necessary.

Food systems literature today theorizes improved economic, social, and environmental outcomes created by RFNs for the communities in which they are embedded. However, economic, social, and environmental impacts are inextricably intertwined, and communities are made up of producers, consumers, and a myriad of other food system forces, which illustrate the difficulty in making empirical measurements of economic, social, and environmental statuses of functioning food systems. Ostrom and Jussaume (2012) concluded from their 2002 survey that even personal or utilitarian considerations could lead to public benefits in the future. In our surveys 14 years later in neighboring Oregon, we found that both producers and consumers are strongly motivated by public benefits, with RFN producers seeking to “promote connection to community” and consumers seeking to “support local farmers,” both social and economic goals of the Oregon RFN. We also see some producers that are highly motivated

by their environmental values choosing environmentally sensitive practices and connecting to consumers through direct channels. Putting these motivations together, we can understand how Oregon producers and consumers have found common ground to create new opportunities to generate farm income and acquire food, create social connections in local direct markets, and support environmentally sensitive farming practices in the Oregon RFN. Further development through fostering the connections between producers and consumers has the potential to further develop the RFN through appropriate investments in RFN supply chains. Although Oregon may have a distinctive culture of RFN marketing, a deeper understanding of its RFN may provide inspiration to developing RFNs in both rural and urban areas in other parts of the world. 

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References

- Agresti, A., & Liu, I.-M. (1999). Modeling a categorical variable allowing arbitrarily many category choices. *Biometrics*, 55(3), 936-943. <http://dx.doi.org/10.1111/j.0006-341X.1999.00936.x>
- Bernard, H. R. (2011). *Research methods in anthropology: Qualitative and quantitative approaches* (5th ed.). Lanham, Maryland: AltaMira Press.
- Bilder, C. R., & Loughin, T. M. (2004). Testing for marginal independence between two categorical variables with multiple responses. *Biometrics*, 60(1), 241-248. <http://dx.doi.org/10.1111/j.0006-341X.2004.00147.x>
- Brekken, C. A., Gwin, L., Horst, M., McAdams, N., Martin, S., & Stephenson, G. (2016, September). *The future of Oregon's agricultural land*. Corvallis: Oregon State University Center for Small Farms. Retrieved from <http://hdl.handle.net/1957/59900>
- Burnett, P., Kuethe, T. H., & Price, C. (2011). Consumer preference for locally grown produce: An analysis of willingness-to-pay and geographic scale. *Journal of Agriculture, Food Systems, and Community Development*, 2(1), 269-278. <http://dx.doi.org/10.5304/jafscd.2011.021.013>
- Chang, K.-L., Xu, P., Warmann, J., Lone, T., Munzimi, Z.-S., & Opoku, E. (2013). Consumer characteristics and willingness to pay for locally produced product: A case study of rib-eye steaks in the northern Great Plains. *Journal of Agriculture, Food Systems, and Community Development*, 4(1), 99-121. <http://dx.doi.org/10.5304/jafscd.2013.041.003>
- Clancy, K., & Ruhf, K. (2010). Is local enough? Some arguments for regional food systems. *Choices: The Magazine of Food, Farm and Resource Issues*, 25(1). Retrieved from <http://www.choicesmagazine.org/magazine/article.php?article=114>
- Cone, C. A., & Myrhe, A. (2000). Community-supported agriculture: A sustainable alternative to industrial agriculture? *Human Organization*, 59(2), 187-197. <http://dx.doi.org/10.17730/humo.59.2.715203t206g2j153>

- Darby, K., Batte, M. T., Ernst, S., & Roe, B. (2008). Decomposing local: A conjoint analysis of locally produced foods. *American Journal of Agricultural Economics*, 90(2), 476-486. <http://dx.doi.org/10.1111/j.1467-8276.2007.01111.x>
- Feenstra, G., Allen, P., Hardesty, S., Ohmart, J., & Perez, J. (2011). Using a supply chain analysis to assess the sustainability of farm-to-institution programs. *Journal of Agriculture, Food Systems, and Community Development*, 1(4), 69-85. <http://dx.doi.org/10.5304/jafscd.2011.014.009>
- Galt, R. E. (2013). The moral economy is a double-edged sword: Explaining farmers' earnings and self-exploitation in community-supported agriculture. *Economic Geography*, 89(4), 341-365. <http://dx.doi.org/10.1111/ecge.12015>
- Hoppe, R. A. (2014, December). *Structure and finances of U.S. farms: Family farm report, 2014 edition*. (Economic Information Bulletin No. 132). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/43913/50364_eib-132.pdf?v=42103
- Knudson, W. A. (2010). *Demand drivers facing the food system* (Strategic Marketing Institute Working Paper No. 01-0310). East Lansing: Michigan State University. Retrieved from <http://productcenter.msu.edu/uploads/files/demanddrivers2010.pdf>
- Lerman, T. (2013). *Who benefits from marketing farmers? An examination of farm-identified produce distribution in Bay Area grocery stores* (Master's thesis). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 1546220).
- Liang, K., & Dunn, P. (2014). Examining entrepreneurial characteristics, motivations, barriers, and outcomes for small versus large multifunctional farm enterprises in New England. *Journal of Business and Entrepreneurship*, 26(2), 64-94.
- Liang, K., & Dunn, P. (2016). Understanding barriers for and information seeking strategies by agritourism entrepreneurs in New England. *Journal of Business and Entrepreneurship*, 27(2), 149-167.
- Low, S. A., Adalja, A., Beaulieu, E., Key, N., Martinez, S., Melton, A., ... Jablonski, B. B. R. (2015). *Trends in U.S. local and regional food systems: Report to Congress*. (Administrative Publication No. 068). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/42805/51173_ap068.pdf?v=42083.
- Low, S. A., & Vogel, S. (2011). *Direct and intermediated marketing of local foods in the United States* (Economic Research Report No. 128). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/44924/8276_err128_2.pdf?v=41056
- Maples, M., Morgan, K. L., Interis, M. G., & Harri, A. (2013). Who buys food directly from producers in the southeastern United States? *Journal of Agricultural and Applied Economics*, 45(3), 509-518. <http://dx.doi.org/10.1017/S1074070800005022>
- Martinez, M., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., ... Newman, C. (2010). *Local food systems: Concepts, impacts, and issues* (Economic Research Report No. 97). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/46393/7054_err97_1.pdf?v=42265
- Nelligan, D., Cameron, N., Mackinnon, B. L., & Vance, C. (2016). Bridging gaps: A framework for developing regional food systems. *Journal of Agriculture, Food Systems, and Community Development*, 7(1), 49-69. <http://dx.doi.org/10.5304/jafscd.2016.071.007>
- Onozaka, Y., Nurse, G., & McFadden, D. T. (2010). Local food consumers: How motivations and perceptions translate to buying behavior. *Choices: The Magazine of Food, Farm and Resource Issues*, 25(1). Retrieved from <http://www.choicesmagazine.org/magazine/article.php?article=109>
- Oregon Department of Agriculture. (2016, December 21). Local markets a vital part of Oregon agriculture. Salem: Oregon Department of Agriculture. [Online newsgroup]. Retrieved from <http://odanews.wpengine.com/local-markets-a-vital-part-of-oregon-agriculture/>
- Ostrom, M. R., & Jussaume, R. A., Jr. (2007). Assessing the significance of direct farmer-consumer linkages as a change strategy in Washington state: Civic or opportunistic? In C. C. Hinrichs & T. A. Lyson (Eds.), *Remaking the North American Food System: Strategies for sustainability* (pp. 235-259). Lincoln: University of Nebraska Press.
- Ostrom, M., & Jussaume, R. A., Jr. (2012, July). *Reframing food: Understanding trends in consumer food purchasing and implications for agri-food movement mobilization in the northwestern U. S.* Paper presented at the 10th International Farming Systems Association Symposium (IFSA), Aarhus University, Aarhus, Denmark. Retrieved from http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2012/IFSA2012_WS4.1_Ostrom.pdf

- Ostrom, M., & Stevenson, G. W. (2013, October). *Values-based food supply chains: Full Circle*. Madison: University of Wisconsin, Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/featured/values-based-food-supply-chain-case-study-full-circle>
- Peterson, H. H., Selfa, T., & Janke, R. (2010). Barriers and opportunities for sustainable food systems in northeastern Kansas. *Sustainability*, 2(1), 232-251. <http://dx.doi.org/10.3390/su2010232>
- Sorte, B., & Rahe, M. (2015, December). *Oregon agriculture, food and fiber: An economic analysis*. Corvallis: Oregon State University Extension Service. Retrieved from http://agsci.oregonstate.edu/sites/agsci.oregonstate.edu/files/oregon_agriculture_2015.pdf
- Stevenson, G. W. (2013). *Values-based food supply chains: Organic Valley*. Madison: University of Wisconsin, Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/wp-content/uploads/2013/04/organicvalleyfinal041813.pdf>
- Stevenson, G. W., & Lev, L. (2009). *Mid-scale food value chains case study: Country Natural Beef* (Research Brief No. 79). Madison: University of Wisconsin, Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/wp-content/uploads/2009/11/rb79final2.pdf>
- Stevenson, G. W., & Lev, L. (2010). *Mid-scale food value chains case study: Red Tomato* (Research Brief No. 82). Madison: University of Wisconsin, Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/wp-content/uploads/2010/05/rb82final.pdf>
- Stevenson, G. W., & Lev, L. (2013). *Values-based food supply chains: Shepherd's Grain*. Madison: University of Wisconsin, Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/wp-content/uploads/2013/04/shepherdsgrainfinal050713.pdf>
- Thilmany, D., Bond, C. A., & Bond, J. K. (2008). Going local: Exploring consumer behavior and motivations for direct food purchases. *American Journal of Agricultural Economics*, 90(5), 1303-1309. <http://dx.doi.org/10.1111/j.1467-8276.2008.01221.x>
- U.S. Department of Agriculture, National Agricultural Statistics Service [USDA NASS]. (2014a). *2012 Census of Agriculture, state data, Oregon: Summary by size of farm* [Data file]. Washington, D.C.: Author. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1_Chapter_1_State_Level/Oregon/st41_1_064_064.pdf
- USDA NASS. (2014b). *2012 Census highlights: Beginning farmers—Characteristics by years on current farm*. Washington, D.C.: Author. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Beginning_Farmers/
- USDA NASS. (2015). *2015 Local Foods Marketing Practices Survey, Oregon statistics* [Table]. Washington, D.C.: Author. Retrieved from <https://quickstats.nass.usda.gov/results/F56FD130-F71A-3904-9490-E7610683DFE0>
- Wilson, R. K., Di Salvo, P. A., Quinn, C. E., Englot, S. T., & Mitchell, J. P. (2014). Growing pains or opportunities? A customer survey of three farmers' markets in one rural community. *Journal of Extension*, 52(2). Retrieved from <https://www.joe.org/joe/2014april/rb3.php>
- Wolf, M. M., Spittler, A., & Ahern, J. (2005). A profile of farmers' market consumers and the perceived advantages of produce sold at farmers' markets. *Journal of Food Distribution Research*, 36(1), 192-201. Retrieved from <http://ageconsearch.umn.edu/bitstream/26768/1/36010192.pdf>

Appendix A. Producer Survey Results

Table A1. Marketing Channels by Farm Attributes (all income in US\$)

Product	Agritourism		Direct to Consumer		Local Retail/Restaurant		Local/Regional Institutions		Local/Regional Distributors		National/International Distributors	
	Corr r-value	%	Corr r-value	%	Corr r-value	%	Corr r-value	%	Corr r-value	%	Corr r-value	%
Grain	0.002	5.4%	-0.40****	3.3%	-0.1	4.3%	0.06	7.4%	0.14	9.8%	0.54****	28.6%
Vegetables	-0.04	21.6%	0.17*	28.0%	0.40****	32.9%	0.14	29.6%	-0.13	21.3%	-0.17*	14.3%
Berry/Fruit/Nuts	-0.10	13.5%	0.11	21.8%	0.28***	23.6%	0.12	22.2%	-0.00	24.6%	-0.18*	25.0%
Nursery/Christmas/Forest	0.16*	16.2%	0.18*	11.8%	0.10	13.6%	-0.01	3.7%	0.00	8.2%	-0.03	3.6%
Hay/Silage/Seeds	0.08	13.5%	-0.20**	9.5%	-0.11	8.6%	0.18*	18.5%	0.10	14.8%	0.14	17.9%
Animal Products	0.16*	29.7%	0.13	25.6%	-0.25***	17.1%	-0.02	18.5%	-0.08	21.3%	-0.20**	10.7%
Gross Income												
<US\$25,000	-0.26**	7.7%	0.11	41.3%	-0.15	32.7%	-0.09	25.0%	-0.07	33.3%	-0.23**	9.1%
US\$25,000–US\$249,000	0.23**	61.5%	0.20*	38.7%	0.19*	42.3%	0.02	37.5%	-0.12	25.0%	-0.27***	0.0%
US\$250,000–US\$499,000	0.07	15.4%	-0.05	9.3%	0.06	11.5%	0.03	12.5%	-0.12	4.2%	0.22**	27.3%
US\$500,000 and up	-0.01	15.4%	-0.36****	10.7%	-0.10	13.5%	0.07	25.0%	0.34***	37.5%	0.47****	63.6%
Acres												
<10 (<4 ha)	-0.19**	6.7%	0.22**	33.0%	-0.03	27.6%	-0.06	20.0%	-0.15	17.9%	-0.15	8.3%
10–49 (4 ha–12 ha)	-0.05	26.7%	0.10	35.1%	-0.02	32.8%	0.05	40.0%	-0.09	25.0%	-0.24**	0.0%
50–219 (20 ha–89 ha)	0.15	40.0%	-0.04	23.4%	0.20**	32.8%	-0.10	10.0%	0.16*	35.7%	0.01	25.0%
>220 (>89 ha)	0.14	26.7%	-0.38****	8.5%	-0.22**	6.9%	0.14	30.0%	0.12	21.4%	0.52****	66.7%
Years Farming												
<10 years	0.003	60.0%	0.28***	65.6%	0.08	63.3%	0.002	60.0%	-0.11	50.0%	-0.30***	16.7%
≥10 years	-0.003	40.0%	-0.28***	34.4%	-0.08	36.7%	-0.002	40.0%	0.11	50.0%	0.30***	83.3%
Production Practices												
Conventional	-0.04	5.1%	-0.37****	6.0%	-0.28***	5.1%	0.04	9.1%	0.15	13.3%	0.47****	38.5%
Certified organic	0.12	6.8%	-0.01	5.3%	0.27***	9.5%	0.12	9.1%	0.20**	10.7%	-0.15	0.0%
Organic practices, not certified	-0.07	13.6%	0.26***	23.0%	0.02	24.1%	-0.08	15.2%	-0.27***	14.7%	-0.26***	11.5%
Other conservation	0.19**	20.3%	-0.003	18.8%	0.07	22.2%	0.22**	27.3%	-0.06	18.7%	0.14	34.6%
Grazing/free range	0.14	20.3%	0.27**	19.1%	0.26**	17.7%	-0.11	15.2%	-0.13	16.0%	-0.21*	7.7%
Antibiotic/hormone free	0.21	16.9%	0.25*	13.5%	0.03	11.4%	-0.19	6.1%	-0.06	10.7%	-0.29**	0.0%
Grass/organic fed	0.12	16.9%	-0.11	14.2%	-0.29**	10.1%	0.20	18.2%	0.16	16.0%	-0.03	7.7%

Table A2. Motivations and Barriers to Local and Regional Marketing by Region and Gross Farm Income (in US\$)

Motivations	Total % (ranked)	Non- Willamette Valley (n=34)	Willamette Valley (n=81)	Chi ² p-value	Up to \$25,000 (n=37)	\$25,000 to \$249,000 (n=32)	\$250,000 to \$499,000 (n=8)	\$500,000 and more (n=14)	Chi ² p-value
Increase farm revenue	82.6%	73.5%	86.4%	0.10*	83.8%	87.5%	100.0%	78.6%	0.55
Promote connection to community	78.3%	79.4%	77.8%	0.85	81.1%	71.9%	37.5%	64.3%	0.09
Promote locally made	77.4%	82.4%	75.3%	0.41	51.4%	81.3%	75.0%	71.4%	0.06*
Lifestyle choice	67.0%	64.7%	67.9%	0.74	40.5%	68.8%	37.5%	50.0%	0.10
Diversify farm operation	64.3%	64.7%	64.2%	0.96	81.1%	81.3%	75.0%	64.3%	0.58
Support local health and/or food security	62.6%	79.4%	55.6%	0.02**	51.4%	68.8%	87.5%	50.0%	0.15
Enhance local economy	60.9%	67.6%	58.0%	0.34	8.1%	31.3%	87.5%	21.4%	0.005***
Educational channel for community	51.3%	61.8%	46.9%	0.15	54.1%	84.4%	100.0%	50.0%	0.004***
Provide employment	27.0%	32.4%	24.7%	0.40	75.7%	87.5%	75.0%	71.4%	0.53
Barriers									
Family or operation doesn't fit market	45.2%	50.0%	43.2%	0.50	43.2%	46.9%	62.5%	42.9%	0.79
Time constraints	34.8%	23.5%	39.5%	0.10	27.0%	46.9%	50.0%	42.9%	0.31
Not profitable	33.0%	17.6%	39.5%	0.023**	18.9%	43.8%	75.0%	50.0%	0.008***
Handling or food safety costs	27.8%	26.5%	28.4%	0.83	16.2%	50.0%	62.5%	28.6%	0.008***
Labor costs	22.6%	17.6%	24.7%	0.41	21.6%	28.1%	37.5%	21.4%	0.77
Lack of demand	20.0%	20.6%	19.8%	0.92	8.1%	28.1%	50.0%	28.6%	0.03**
Lack of networks and support	19.1%	11.8%	22.2%	0.19	18.9%	25.0%	50.0%	14.3%	0.23
Transportation costs	18.3%	17.6%	18.5%	0.91	10.8%	31.3%	25.0%	21.4%	0.22
Lack of capital	17.4%	14.7%	18.5%	0.62	16.2%	28.1%	0.0%	14.3%	0.26
Lack of market supply-chain partners	16.5%	8.8%	19.8%	0.15	8.1%	25.0%	50.0%	14.3%	0.03**
Poor coordination or inconsistent payment	14.8%	11.8%	16.0%	0.56	5.4%	18.8%	37.5%	28.6%	0.06*
Lack of training	13.9%	11.8%	14.8%	0.67	16.2%	18.8%	0.0%	7.1%	0.47

Appendix B. Consumer Survey Results

Table B1. Consumer Motivations for Buying Local Food, in Overall Rank Order, by Consumer Attributes (all income in US\$)

Annual Income	<\$25,000 (n=126)	\$25,000–\$49,999 (n=115)	\$50,000–\$100,000 (n=162)	>\$100,000 (n=109)	Chi² p-value
Support local farmers	72.2%	84.3%	82.1%	78.9%	0.09
Tastes better	45.2%	51.3%	41.4%	46.8%	0.43
Environmental concerns	31.0%	49.6%	43.8%	44.0%	0.02**
Promote local food	54.8%	64.3%	59.9%	60.6%	0.50
Preserve agricultural landscapes	37.3%	38.3%	37.7%	33.9%	0.91
Safer to buy	20.6%	24.3%	24.1%	30.3%	0.39
Cook at home (% time prepare food at home)	25% of the time (n=46)	50% of the time (n=77)	75% of the time (n=311)	Always (n=96)	Chi² p-value
Support local farmers	78.3%	79.2%	80.7%	75.0%	0.69
Tastes better	41.3%	36.4%	46.3%	53.1%	0.15
Environmental concerns	26.1%	27.3%	65.2%	45.8%	0.002***
Promote local food	56.5%	62.3%	59.5%	57.3%	0.90
Preserve agricultural landscapes	26.1%	36.4%	35.7%	43.8%	0.22
Safer to buy	28.3%	22.1%	23.2%	31.3%	0.36
Age	18-29 (n=130)	30-49 (n=158)	50-69 (n=174)	>70 (n=22)	Chi² p-value
Support local farmers	70.8%	84.8%	80.5%	81.8%	0.03**
Tastes better	40.8%	44.9%	48.9%	63.6%	0.19
Environmental concerns	26.2%	49.4%	48.3%	50.0%	0.0002****
Promote local food	53.1%	60.1%	62.6%	72.7%	0.21
Preserve agricultural landscapes	37.7%	31.6%	39.1%	50.0%	0.27
Safer to buy	22.3%	21.5%	27.0%	45.5%	0.08

Education	High School (n=38)	College (n=327)	Post College (n=157)	Chi2 p-value
Support local farmers	65.8%	78.6%	84.1%	0.04**
Tastes better	39.5%	45.3%	47.8%	0.64
Environmental concerns	23.7%	35.8%	59.2%	3.77e-07****
Promote local food	36.8%	55.0%	74.5%	2.89e-06****
Preserve agricultural landscapes	26.3%	36.7%	40.1%	0.28
Safer to buy	34.2%	22.0%	28.7%	0.11

Gender	Female (n=361)	Male (n=158)	Chi2 p-value
Support local farmers	82.3%	74.1%	0.03**
Tastes better	47.1%	43.0%	0.39
Environmental concerns	45.7%	33.5%	0.01***
Promote local food	62.9%	53.2%	0.04**
Preserve agricultural landscapes	41.0%	28.5%	0.007***
Safer to buy	26.3%	22.2%	0.31

Willing to Pay (v. typical price)	Equal to or less (n=107)	10% above (n=205)	25% above (n=184)	50% and above (n=32)	Chi2 p-value
Support local farmers	61.7%	78.0%	89.7%	87.5%	2.11e-07****
Tastes better	33.6%	47.3%	50.5%	46.9%	0.04**
Environmental concerns	21.5%	34.6%	54.9%	78.1%	2.0e-11****
Promote local food	44.9%	55.6%	67.4%	81.3%	7.40e-05****
Preserve agricultural landscapes	16.8%	33.2%	49.5%	46.9%	2.27e-07****
Safer to buy	19.6%	25.9%	24.5%	34.4%	0.36

Table B2. Consumer Willingness to Pay for Local Foods, % Above Typical Prices

Annual Income	<\$25,000 (n=126)	\$25,000–\$49,999 (n=115)	\$50,000–\$100,000 (n=161)	>\$100,000 (n=108)	
>50% above	1.6%	5.2%	7.5%	10.2%	
25% above	29.4%	33.6%	40.4%	37.0%	
10% above	40.5%	42.2%	31.7%	41.7%	chi ² =22.77
Equal to or less	28.6%	18.1%	20.5%	11.1%	p=0.03**
Cook at Home (% time prepare food at home)	25% of the time (n=46)	50% of the time (n=77)	75% of the time (n=308)	Always (n=96)	
>50% above	8.7%	2.6%	6.5%	6.3%	
25% above	15.2%	29.9%	38.3%	36.5%	
10% above	41.3%	50.7%	36.0%	37.5%	chi ² =17.84
Equal to or less	34.8%	16.9%	19.2%	19.8%	p=0.04**
Age	18-29 (n=130)	30-49 (n=157)	50-69 (n=173)	70 and up (n=22)	
>50% above	3.1%	6.4%	8.1%	13.6%	
25% above	29.2%	41.4%	31.8%	31.8%	
10% above	40.0%	34.4%	42.2%	40.9%	chi ² =14.73
Equal to or less	27.7%	17.8%	17.9%	13.6%	p=0.099*
Education	High School (n=39)	College (n=327)	Post-College (n=155)		
>50% above	7.7%	2.5%	12.9%		
25% above	18.0%	35.2%	38.7%		
10% above	41.0%	41.6%	32.9%		chi ² =30.65
Equal to or less	33.3%	20.8%	15.5%		p=2.96E-05****
Gender	Female (n=359)	Male (n=158)			
>50% above	5.6%	7.0%			
25% above	36.5%	31.7%			
10% above	41.2%	32.9%			chi ² =10.53
Equal to or less	16.7%	28.5%			p=0.02**

Monthly Grocery Spending	Less than \$300 (n=267)	\$300 to \$500 (n=174)	More than \$500 (n=87)	
>50% above	3.4%	8.1%	10.3%	
25% above	31.8%	36.8%	40.2%	
10% above	41.2%	37.9%	33.3%	chi ² =12.65
Equal to or less	23.6%	17.2%	16.1%	p=0.05**

Farm Visit 2015	No (n=166)	Yes (n=359)	
>50% above	6.0%	6.1%	
25% above	25.9%	39.0%	
10% above	35.5%	40.7%	chi ² =25.41
Equal to or less	32.5%	14.2%	p=1.3E-05****

Table B3: Non-Willamette Valley and Willamette Valley Consumer Responses, by Consumer Attributes (all income in US\$)

Define Local	Total %	Non-Willamette Valley (n=96)	Willamette Valley (n=393)	
Within 25 miles (40 km)	13.7%	9.6%	14.9%	
Within 50 miles (80 km)	26.9%	22.3%	28.3%	
Within 100 miles (161 km)	19.7%	22.3%	18.9%	
Within my state	32.0%	33.0%	31.7%	
I don't know	1.2%	3.2%	0.6%	chi ² p-value=
Other	6.5%	9.6%	5.6%	0.12
Willing to Pay				
Greater than 50% above typical price	6.2%	3.2%	7.1%	
25% above typical price	34.5%	30.5%	35.7%	
10% above typical price	37.4%	32.6%	38.8%	chi ² p-value=
Equal to or less than the typical price	21.8%	33.7%	18.3%	0.01**
Annual Income				
Less than US\$25,000	25.4%	16.3%	28.0%	
US\$25,000–US\$50,000	22.9%	29.3%	21.1%	
US\$50,000–US\$100,000	32.0%	40.2%	29.6%	chi ² p-value=
Over US\$100,000	19.8%	14.1%	21.4%	0.02**
Monthly grocery spending				
Less than US\$300	50.4%	45.8%	51.7%	
US\$300 to US\$500	33.7%	33.3%	33.7%	chi ² p-value=
More than US\$500	16.0%	20.8%	14.6%	0.31
Age				
18–29	25.9%	13.6%	29.5%	
30–49	31.6%	26.1%	33.2%	
50–69	38.9%	53.4%	34.6%	chi ² p-value=
70 and up	3.6%	6.8%	2.7%	0.0007****
Farm Visit 2015				
No	29.4%	42.7%	25.4%	chi ² p-value=
Yes	70.6%	57.3%	74.6%	0.001***

Participatory praxis for community food security education

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Abstract

Community food security (CFS) has a robust history as a social movement addressing the politics and practice of food access and availability. While CFS advocacy and policy activity are closely connected to grassroots efforts, the academic community has supported CFS goals in a number of ways. CFS intersects with similar food movements, such as food sovereignty, emphasizing

a social justice agenda for achieving democratic social change in the food system. In our paper, we illustrate the teaching of CFS in higher education at the graduate level where masters, professional, and doctoral students seek programmatic and community-based research experiences rooted in the goals of food justice, health equity, and ecological sustainability. Drawing upon a participatory education and critical pedagogy philosophy, we describe our approach and outcomes in developing a graduate course centered on CFS with two institutions and stakeholder participation in

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central Appalachia. An interdisciplinary approach was taken using a food justice lens, with special attention given to rurality, race, and class as issues informing CFS work in the region. We illustrate how course themes, assignments, and community engagement aims were collectively developed by students, faculty, and community practitioners through the Appalachian Foodshed Project, a regional CFS project. We focus our insights learned through several processes: developing and offering a pilot course in food systems; conducting focus groups with graduate students from two institutions; and collecting course evaluations from the final CFS course we developed. Our paper concludes with suggestions for utilizing a participatory approach—as praxis—to create new opportunities for students, faculty, and CFS practitioners to learn together for food systems change.

Keywords

Action Research; Community Food Security; Critical Pedagogy; Curriculum; Food Systems; Participatory Education

Introduction and Review of the Literature

Community food security (CFS) has a robust history as a social movement addressing the politics and practice of food access and availability. Acknowledged as a space for advocacy, policy, and programming, CFS efforts have largely emerged from grassroots activity and partnerships (Anderson & Cook, 1999; Fisher & Gottlieb, 1995; Joseph, 1997). As a social movement, CFS intersects with similar movements, such as food sovereignty and food justice, as well as professional fields and academic disciplines including public health, community nutrition, urban and regional planning, ecology, sustainable agriculture, sustainable development, and asset-based community development (Allen, 2004, 2010; Embry, Fryman, Habib, & Abi-Nader, 2012; Patel, 2009; Pothukuchi, 2004; Winne, 2008). In terms of an assessment approach, CFS extends beyond a focus on individual or household food security where food access, availability, and affordability issues are generally discussed in technical terms, and where solutions are addressed through procedural and behavior-based interventions. Instead, CFS empha-

sizes the complexity of food system influences with the goal of developing healthy communities and capacity for socially just, economically vibrant, and environmentally sound food and farming systems embedded in local needs, people, and places (Abi-Nader et al., 2009). The definition of CFS proposed by Hamm and Bellows (2003), that all “community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice” (p. 37), reflects this dynamic scope and continues to inform the work of advocates, policy-makers, scholars, and practitioners. According to Abi-Nader et al. (2009), CFS is also a holistic community-building approach for assessing and improving the access and availability of healthy and culturally appropriate food for all members of a community. This focus on a community process provides us with the means to explore and enhance our communities through participatory approaches by purposefully intersecting issues of food, farm, and health (Pothukuchi, 2004).

Viewing CFS as both a concept and movement for social change provides an opportunity for community-university engagement as a strategy to address some of our most pressing food, health, and agricultural issues. According to Allen (2004) and Pothukuchi, Seidenburg, and Abi-Nader (2007), the CFS movement has provided new perspectives to ongoing challenges, created policy, and implemented new food system programs through a number of institutional partnerships and collaborations with universities, federal agencies, and community stakeholders. For Tanaka and Mooney (2010), food security may help “bring university and community members closer together to pursue public scholarship and community engagement” (p. 562). The fields of community nutrition, anthropology, sociology, critical food studies, and urban planning are just a few academic disciplines in which this engagement has taken hold in productive ways (see Barndt, 2012; Carney et al., 2012; Ibáñez-Carrasco & Riaño-Alcalá, 2009; Julier, 2015; Levkoe & Wakefield, 2011; Nelson & Dodd, 2016). According to McCullum et al. (2002) and Minkler (2000), a growing number of CFS projects are the result of linking local and institu-

tional relationships and resources in the design and implementation of food security and food system research and outreach. This “linking” approach largely falls under the umbrella of action research (Greenwood & Levin, 2007), participatory action research (Freire, 2007; Reason & Bradbury, 2008), community-based participatory research (Israel, Eng, Schulz, & Parker, 2005), and community-based research (Strand, Marullo, Cutforth, Stoecker, & Donohue, 2003). These participatory approaches are increasingly popular in CFS-related fields with connections to participatory education and community development practices (Minkler, 2000). Although each approach illustrates different historical and disciplinary perspectives, we note a common thread across all. This involves an orientation to research based on equitable knowledge creation and power sharing among all partners to produce practical and socially just outcomes for community members.¹

It is from this action research perspective we apply participatory praxis as a concept framing our CFS course. In education, praxis breaks down the unproductive notion that theory and practice are separate ideas (Carr & Kemmis, 1986; Lather, 1991). Drawing upon Thompson and Pascal (2012), we use the concept to explain how our educational practices are performed and then re-performed to be more effective in addressing inequalities in our everyday work.² Hence, praxis brings together critical reflection, theory, and practice, in participation with others through dialogue, to help develop a critical worldview and actionable ideas for socially just outcomes. As food system

educators, we draw upon this participatory education and critical pedagogy philosophy in the classroom to help us create new and transformative spaces in CFS graduate education. We drew upon this approach to utilize action research and participatory decision-making with faculty, students, and community stakeholders in the design and implementation of a graduate course focused on CFS. To show how we did this, and what it looked like, we next describe the growth of food systems education and its relationship to CFS, action research in the classroom, and the role community members and students play in the development of food system learning experiences.

Paralleling a growth in participatory scholarship within CFS is an upwelling of courses and curricula across various colleges and universities that intersect with CFS through programs in critical food studies, food systems, agroecology, and sustainable agriculture (Barndt, 2012; Clark, Byker, Niewolny, & Helms, 2013; Galt, Parr, Van Soelen Kim, Beckett, Lickter, & Ballard, 2013; Meek & Tarlau, 2016; Niewolny et al., 2012; Parr & Trexler, 2011). While course names, content, and aims differ, curricular experiences are increasingly focused on complex social and ecological problems as “wicked problems” (Hamm, 2009) in learning environments where students engage first-hand with food and farming issues (Parr, Trexler, Khanna, & Battisti, 2007). In this vein, the National Research Council (2009) has encouraged institutions of higher education to develop innovative, community-university learning experiences to more readily address 21st-century challenges, such as climate change and global food security. In the United States, several of these new courses and programs reflect the multifaceted and historical mission of land-grant universities, where aims of democratic citizenship and community service are emphasized (Jacobson et al., 2012). Sustainable agriculture programs, in particular, provide a platform for engaged curricula focusing on experiential learning, service-learning, and community-university partnerships (Niewolny et al., 2012).

We also see growth in course-based action research tied to this thread of food system education (Hofman & Rosing, 2007; Ibáñez-Carrasco

¹ Following our training, we recognize that “action research” as used in this paper refers to a collaborative and change-oriented framework used to conduct research with community stakeholders in equal partnership to address issues of social justice and democratic community change (Greenwood & Levin, 2007; Weber, 2011).

² Praxis is associated with Freire’s (2007) perspective of Marxist thought where co-learning, critical reflection, and engaged dialogue are crucial to transforming unjust knowledge and realities. For Freire, participatory education and critical pedagogy lead to the construction of a critical consciousness, which is the foundational ability for learners to begin questioning the nature of her/his/their historical and social situation and the power relationships that (re)construct this reality.

& Riaño-Alcalá, 2009; Nelson & Dodd, 2016). Course-based action research allows for participatory teaching and learning to serve as a vehicle for student, faculty, and community engagement for the purpose of understanding and addressing student-community goals. While teaching and learning aims may vary, several themes are foundational to the course-based action approach. First, course goals and activities may reflect ongoing or newly developed action research projects that a professor or faculty team are co-conducting with a community (Ibáñez-Carrasco & Riaño-Alcalá, 2009). Second, participatory and community-student learning opportunities are essential in co-developing content skills and knowledge where democratic and social justice principles are equally important as disciplinary-based content (Reardon, 1998; Strand et al., 2003). Third, students have active roles in course development and implementation to reflect the action-research principle of shared knowledge production and democratic decision-making (Strand, 2000).

While all three themes are equally central for CFS and related coursework, it is the last point that we focus on for the course described in this paper: student participation in CFS course design and implementation. While instructors may gather student feedback from course evaluations or other methods, this is typically done after much of the course has already been developed. Extensive changes to course content, learning objectives, and assessments based on student perspectives and ideas can be difficult to implement post hoc. Moreover, given the traditional division of roles for faculty and students and the usual predefined, content-driven syllabus, it is rare for faculty and students to collaborate as equal participants in the process of teaching and learning (Cooke-Sather, Bovill, & Felten, 2014) and especially in the process of course development when community stakeholders are equally involved. When students are provided opportunities to participate actively in their learning and collaborate with faculty in teaching activities and course design, studies have demonstrated improved student motivation and problem-solving skills (Hudd, 2003), empowerment (Shafaei & Nejati, 2012), and deeper engagement and communication leading to improved

teaching and learning (Cooke-Sather, 2014).

Our CFS graduate course development process and outcomes are distinctive in a few ways. While courses that incorporate or focus entirely on CFS offer a unique platform for engaging students in food systems work, there is still an ambiguous understanding of student-centered approaches in food systems education (Galt, Clark, & Parr, 2012; Galt et al., 2013) and the active role students and community stakeholders may play together in course design and activities. We also suggest that there is a greater focus on food systems and sustainable agriculture education with less attention given directly to the complexity and urgency of community food security and its intersection with social justice and food sovereignty movements. With this paper, we aim to help fill these gaps. What follows is a description of the development process and outcomes of a community-student-centered graduate course in CFS that involved graduate students and faculty from two institutions, Virginia Tech and North Carolina State University and community stakeholders participating in the Appalachian Foodshed Project (AFP). Our graduate course development process was directly tied to the AFP, which was a multiyear action research project funded by a grant from the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture–Agriculture and Food Research Initiative (NIFA-AFRI) that addressed the critical issue of community food security in West Virginia and the Appalachian areas of North Carolina and Virginia through research, outreach, and education. At the heart of the AFP was the development of a regional network (or network of networks) to inspire, guide, and implement strategies and to build capacity to enhance community food security (Hamm & Bellows, 2003). As a university-community partnership, the AFP engaged farmers, policy-makers, nonprofit organizations, community-based organizations, extension, and university institutions to build community capacity, cultural understanding, and organizational cohesion while implementing positive changes across the regional food system through graduate education, CFS assessment work, food system modeling, and network development. This included learning from and building relation-

ships with a diversity of stakeholders related to community and economic development, health and nutrition, environmental advocacy, social justice, and food production, processing, and distribution.

In this paper, we describe the participatory process for how CFS course themes, assignments, and community engagement aims were developed by students, faculty, and community practitioners through the AFP. This includes reference to the Stories of Community Food Work in Appalachia initiative that AFP community partners and students co-developed as an example of utilizing course-based action research. Second, we share CFS course format and themes with an emphasis on findings from conducting focus groups with graduate student across two institutions. This is followed by insights from our experience teaching the culminating course and student input from evaluations of the CFS course offered in spring 2015. We conclude with suggestions and considerations for utilizing a participatory approach—as praxis—to create new curricular collaborations and opportunities for students, faculty, and CFS practitioners to learn together for food systems change.

Creating the Course: The Story of “Food Security and Resilient Communities”

One of the five objectives of the AFP was to create and offer graduate-level coursework across the institutions focusing on the conceptual and programmatic approaches to understanding the complexity of community food security and food systems change. The core themes of the AFP—social justice and social transformation—informed the focus on building capacity for cultural, ecological, and economic justice to better address concerns about food access, availability, and affordability in the Appalachian region. At the onset of the project, the university-community AFP leadership team agreed that the CFS course should be locally responsive to project activity and to student and community stakeholder needs, while also addressing broader issues from an interdisciplinary and intersectional perspective. We also decided that the CFS course should provide opportunities for graduate students to engage in CFS research with community members. We further focused on

linking advanced-level student skills and interests with community needs as part of the AFP experience.

An AFP curriculum team formed in year two of the project and developed a food systems graduate course as a pilot. A faculty member of the AFP curriculum team conducted the pilot at Virginia Tech as an action research-based course with students and AFP community partners in southwest Virginia. Offered in 2013, the pilot course provided a unique opportunity to explore and assess CFS curricular goals and learning activities through group dialogue and the creation of a narrative-inquiry project with graduate students and AFP community stakeholders. Much of this work guided our next steps and the final course curriculum, which is discussed below.

In early 2014, a team of four graduate students and three faculty from Virginia Tech and North Carolina State University and several AFP community stakeholders across both states, worked together to develop the course presented in this paper. Course objectives, content, assessment, and community engagement aims took one year to develop. The “Food Security and Resilient Communities” course was finally offered in the spring of 2015 at Virginia Tech with the goal of co-offering the course at North Carolina State University.

We draw on four sources of data and insight to illustrate our participatory course process. First, we draw upon our project notes and observations taken over the span of the AFP’s work, including numerous AFP team meetings with faculty, students, and community members held between 2012 and 2016. Second, we include observations and ideas gleaned throughout the earlier food systems course piloted in 2013. Third, we include findings from four focus groups conducted in 2014 with 27 graduate students across two of the three universities involved in the AFP project. Here, we used knowledge learned from the piloted food systems course to develop Institutional Review Board (IRB)–approved protocol and questions to conduct focus groups with graduate students at Virginia Tech and North Carolina State University (Appendix A). Lastly, we offer insights learned from teaching the final course based on our

experiences and student evaluations from the 12 graduate students who participated in course work and design (Appendix B).

We share our story in three main sections. First, we show how the community played a role in our course development process. We next illustrate how graduate students were central in the creation of CFS course themes and learning activities. Finally, we describe the culminating CFS course design with key participatory and food system elements that framed it.

The Participatory Process: Community Role

We embed our participatory praxis in the AFP's collaborative governance framework known as Dynamic Governance (now Circle Forward) (Buck & Villines, 2007; Kunkler, 2017). The tristate AFP leadership team evolved over five years to include more than 10 university faculty and staff, 7 graduate students, and 12 community partners from North Carolina (NC), Virginia (VA), and West Virginia (WV). This leadership group created specific teams to address project objectives and activities. Each team, like the AFP curriculum team, brought its progress to the leadership team to discuss at a regional and/or state-specific level as needed. The community partners involved in the decision-making for the CFS course started with the AFP leadership team. As the course developed further, decisions were operationalized at the local level in VA and NC. This occurred through the earlier food systems course offered at Virginia Tech with 10 VA partners involved in the design and implementation of a community food security assessment. All became involved in the course through their interest in building networks to better connect the experiences of people working for food systems change across Appalachian VA. During a community meeting in late 2013, community members proposed sharing stories of their individual work and life experiences to better understand and build upon them for greater regional understanding. With support of a Virginia Tech faculty member, the group agreed to co-launch a narrative project to create and share their stories to enhance regional connectivity as a practical first step. The group also agreed that the course could serve as the backdrop for the

community partners to collaborate with the university to co-implement this narrative effort, which was titled *Stories of Community Food Work in Appalachia* (Niewolny, 2016). These stories became an informal, intimate space for these and other community members to build understanding and empathy about the everyday experiences of people working to make a positive change in the regional food system. The stories highlight individual and collective voices and describe projects, such as the creation of a CSA-food pantry partnership, structures for community organizing, the formation of new food hubs, youth and senior advocacy for food access, and the impact of school and community gardens (Niewolny & D'Adamo-Damery, 2016).

The pilot (2013) and final (2015) courses became the vehicles for the making and sharing of the community food work stories; thus it was from this perspective that AFP community partners actively provided their input and presence in creating and teaching of CFS course. Specifically, this narrative-inquiry research provided an important foundation for campus and community discussions about CFS and the role graduate education can play in building capacity for a healthy food system in the region. We followed action research principles (Greenwood & Levin, 2007), with AFP community practitioners and graduate students taking the course to create an IRB-approved protocol for the storytelling process and questions that informed the narrative-based interview. This approach allowed the community member to tell their³ own stories through a series of mutually agreed upon "prompting" questions to emphasize their worldviews. Following our IRB process, each narrative was consented to, audio-recorded, transcribed, re-transcribed with editing, and configured as a public and digital narrative through a co-reading and framing process with the interviewers (graduate students) and storytellers (community partners). As a culminating course assignment, graduate students were charged with conducting, transcribing, and co-editing the interviews and with

³ "They" and "their" are used as gender-neutral pronouns throughout the paper.

providing critical reflection on what they had learned from the story and the story-making process. Seven narratives were co-developed in the spring of 2013. In 2015, 12 additional stories were co-created through the final CFS course using a similar action research process with AFP partners and graduate students.

The Participatory Process: Graduate Student Focus Groups

Graduate students played a significant role in the design of the CFS course. Drawing upon the success of the piloted action research-based course, the AFP curriculum team sought to reach out to a greater and more diverse student audience from Virginia Tech and North Carolina State University to explore the possibility of creating a shared and interdisciplinary graduate course to offer at both universities. With the leadership of four graduate students involved in the AFP project, one of whom took the pilot course in 2013, and three AFP faculty (Virginia Tech, $n=2$; and North Carolina State University, $n=1$), the process of developing an IRB-approved protocol to conduct four focus group sessions began. Our goal was to recruit graduate students from both universities to create an interdisciplinary pool for the focus group sessions. These focus groups took place in April 2014 with three AFP faculty (Virginia Tech, $n=2$; and North Carolina State University, $n=1$) at both institutions. With informed consent from student participants, we audio-recorded sessions and transcribed them verbatim. The AFP graduate students served as the primary facilitators for each focus group session. During the transcription process, we replaced all identifying names with pseudonyms.

A total of 27 graduate students participated in the focus group sessions with 16 students at Virginia Tech and 11 at North Carolina State University composed of 17 self-identified females and 10 males. Participating graduate students came from diverse fields and disciplines (e.g., regional planning, sociology, natural resources, soil science, and education) across seven departments represented in three colleges across both universities. While many students voluntarily shared that they were U.S. citizens interested in domestic food

security issues, several students either identified as international students or explicitly stated interest in studying some aspect of global food security.

We followed a descriptive qualitative design to guide the analysis of the transcripts for course content and process themes (Creswell, 2009). All transcripts were imported into ATLAS.ti to apply line-by-line coding; we identified themes and codes based on the prompting questions (Muhr, 2004). Additional codes were added based on notes the researchers took during the focus groups. One Virginia Tech researcher coded the Virginia Tech transcripts, and one North Carolina State University researcher coded North Carolina State University transcripts. The Virginia Tech researcher then reviewed the North Carolina State University transcripts and recoded sections to ensure inter-coder agreement. We coded the data line-by-line to explore (1) how students understood and defined food security and food system issues; (2) personal and professional aims and motivations to study and engage with food security topics; and (3) course activity and assessment preferences to address learning goals.

Overall, our focus group data resulted in several overarching themes used to help frame the content and approach of the CFS course. These themes include a focus on students' preferences to explore or incorporate (1) a politicized understanding of food security as CFS; (2) interdisciplinary and community engagement perspectives of CFS work; and (3) personal experience and positionality in the food system. Students also mentioned their interest in exploring theoretical, programmatic, and policy approaches from both domestic and international viewpoints and literature. Together, these themes highlight students' professional and personal knowledge and learning goals.

Framing Food Security as CFS

First, the data revealed students' perceived knowledge of food security definitions and topic areas largely within the discourse of CFS. We intentionally did not provide students with a definition of food security or CFS at the onset of the focus group sessions. We asked students to provide a definition and use language they were familiar with to help frame food security discourse

from their perspectives. Our goal was to learn how students intersect with its many meanings, disciplinary influences, and issues. “Food security,” “community food security,” and “food sovereignty” were terms commonly applied in the sessions, yet meanings varied as students discussed the scale, scope, and role of politics in healthy food access, availability, and affordability issues. For example, this student draws upon the commonly held “consumption vs. production” perception of food security in her definition:

My definition focuses more heavily on consumption instead of production. Being free from worry is a big central component of food security. Like not worrying about the food that you do have is going to make you unhealthy, or not worrying that you aren’t going to have enough money for it. Or just not worry that there is not going to be any regardless of how much it is. If a community was food secure you would not have much expression of that worry at the community level, like you wouldn’t have a lot of policy measures in play, like SNAP, or political responses to worry about...

Many students were familiar with the politics of the food system and how power influences food production, distribution, access, and waste—impacting food security at the household, community, and transnational levels. This was often communicated through student concerns for social justice and health equity. For instance, a human rights aspect to food security was apparent for this student: “Food security means every single person has the same access to food because that’s what they’re entitled to as a human being. So regardless of age, class, gender, we’re all people. We all have the same rights, and food is one of those rights.”

Students also tied their politicized understanding of food security to economic structure and frameworks, such as neoliberalism, and movement responses to it, such as food sovereignty:

To me, it has to do with the food system’s structural capacity to keep everybody happy and healthy and living a dignified existence.

So it really does have to do with the economic system, the larger economic system, the larger political structures, you know. Having access to the ability to produce food in a food sovereign world, rather than just given the access to this large central organization that’s gonna provide food for me. It just has to do with having a say about how your food system is governed...as well as just the ability to acquire food.

The focus groups also allowed the AFP curriculum team to better understand students’ motivation for taking a CFS course within the context of their own educational and career goals. These motivations were professional and personal in nature and include such reasons as students seeking food security-related policy, agroecological and systems-thinking frameworks related to food security, and programmatic tools to address structural inequalities impacting communities to achieve socially just and healthy food access. This last point is suggested by one student in defining what “community food security” means to them and why it is important to study:

...There are a lot of social and structural barriers to building community food security....I would like to know how are people overcoming these barriers. A lot of marginalized populations don’t have the capacity to address them. They don’t have enough power to even start.

Another student articulates the professional significance of taking a course about food security, as an economist, and how it relates to the economic structures of the food system:

I tend to think in terms of minimizing the impacts of potential market disturbances so when trade routes change, or there’s economic instability. I would like to minimize the impacts on a community of those particular disturbances whether they be economic or socio-political.

Together, we characterized their meanings,

priority topics, and motivations for learning about food security that reflects Hamm and Bellows' (2003) definition of community food security. Food sovereignty and household food security discourses emerged as well, indicating their significance to the course. The following subthemes thus emerged as a list of interdisciplinary topics to frame the first draft of the CFS syllabus:

- Cooperate control of the food system and health equity impacts
- Social justice and food justice
- Food security discourses and policy (e.g., domestic and international perspectives)
- Self-sufficiency, resiliency, and sovereignty
- Agriculture and sustainable food production

Interdisciplinary and Community Engagement Perspectives

The focus group findings further illustrate students' desire for interdisciplinary perspectives and learning collaborations with peers, and their interest in learning from and directly with community practitioners through experiential learning opportunities. Students stated that they were interested in "getting a more realistic perspective" (as opposed to idealistic) and "integrating real world applications" where possible. While not all students explicitly voiced this opinion, a theme that emerged was to break out of traditional classroom models and approaches for this CFS course. This included focusing on such ideas as political advocacy and grant-writing to "fund solutions" to a food security-related problem. In this vein, smaller discussion groups or breakout sessions were preferred to best "explore the work that is being done, what is working, and what isn't."

Views about community engagement were also central to the discussion. Three of the four focus groups strongly agreed that it was important to directly engage with the community at the local or regional level for a course about CFS. In one session, students even proposed creating a study-abroad course to explore global food security as a service-learning initiative. In the domestic sphere, however, student ideas ranged from inviting a diversity of academic speakers to "working directly

with a community or municipality as a service project" and "conduct[ing] a community food security assessment to give back to the local community." Another student suggested they "start a community garden." The viewpoint about service and experiential learning opportunities is further expressed by a participant:

I really like the idea of the service component and actually taking what you learn from the class and putting it into practice. Maybe group projects or something to actually come up with something that you can actually go out into the community and physically do and make a positive impact on the community.

However, disagreement about the nature and design of these experiential and service-based learning opportunities emerged. One of the four focus group sessions raised concern about working directly with community partners through a hands-on or experiential learning opportunity. The reason was not based on a lack of interest. Instead, students in this one group shared their apprehension in terms of not understanding what a community-partner relationship would entail and how that kind of course experience would affect their time to address overall graduate program obligations, including field research responsibilities. The perception was that this could be a time-demanding activity that would be difficult to incorporate into one's schedule to accomplish the engagement goals well. The majority of the participating students, however, were curious about exploring the possibilities of working with a community partner or emphasizing a community issue or project in the course, although the details of this approach were not discussed in depth. For example, the following student shared their perspective on the role of community engagement, CFS, and making an impact where possible:

I will also say, a very clear bias of my own is I think anything that happens in the university should be taken out into the community and given to the community. I don't like to do any kind of work that's just going to stay

cloistered amongst a small number of elitists. In the work that I really have enjoyed here is when research can be taken to the community for their benefit. And that can look like a lot of different types of things.

Student Food System Experiences

Making space for students' personal and professional experiences with food security and food system work was also a central theme. Focus group participants shared a number of stories that helped explain their relationship to the issues, which helped shape our overall understanding of the ideas that drive their interest and motivations in learning about CFS. We also learned what issues were powerful catalysts for framing the specific CFS issues, such as power and privilege, class and race in the food system, and working with low-wealth communities and stakeholders in rural Appalachia. For instance, a student in one focus group shared their experience working several years in the public health sector in a large urban center. They shared how this experience was pivotal to their understanding of the daily experiences of hunger and food insecurity and the role of advocacy in providing solutions where possible:

So I'm thinking of advocacy, and part of that comes from some experience that I had when I worked in public health. I was working with clients every day who had no food in their homes....We were working with this nonprofit that worked with people getting out of homelessness. I would go in as the public health face, and I would work with their youth on some life skills, behaviors and food and nutrition. Anyway, we, the kids and I, and another adult decided to take them to the mayor and have them tell the mayor their stories. It was amazing. He had us come back before city council, and we ended up writing letters to the governor. And a lot came out. I mean I wasn't forcing the kids into anything, this was them. People don't understand what we're dealing with. People don't understand why a kid might miss school, why they are sick, you know. So, to me, it was very powerful to see

the role of advocacy.

While not all students had policy, research, or community experiences to draw upon, many of the students were able to talk about their personal stories and local contexts that they represented. This gave us some sense of what information and knowledge was important to the students, which helped identify ways to best frame challenging and critical perspectives and food production and access issues. One student illustrates this point by sharing their life experience living in Oakland, California, which was critical to their understanding of poverty, urban food insecurity, and finding socially just solutions to complicated food access problems. Here a student responds to "food deserts" as a troubling and politicized concept:

I guess I have to say something about the food deserts because of living in Oakland. I mean yeah, the concept of living in a food desert, when you think about that word, that term, it sounds horrible. There have been pilot projects trying to combat this "food desert thing" where, you know, they start an urban garden. They've actually shown that in six years a three by three-radius block around these gardens have shown a decrease in drug and crime. Even in Oakland itself, in East Oakland and West Oakland....I used to live right in the middle, gunshots all the time, like you have to hopefully own a car so you can drive to the nearest Safeway or anything because they won't open a Safeway there because it's so high in crime, it's so much drugs, so much everything else. Yeah, it obviously takes a lot of community effort to fight against it. ...So unfortunately that is something that probably will persist for a while because it's hard to fight against crime and it takes a community of people. Some of these people will go to school, some of them will stay home, some of them will be gangbangers, and some of them will do other things to come together to try to form, you know, maybe a small little farm or something, even in that little community....I think that food

desert thing, however horrible of a statement it is, it's very applicable and while we don't want to refer to it, you are kind of forced to based on the situations that drive the political climate.

In drawing upon critical pedagogy and participatory educational approaches, we advocate that the stories and experiences of the participant are vital to the learning process. The way students frame their relationship to food system and food security ideas is rooted in their knowledge, ideas, and realities. The cultural context provides the foundation for in-depth and critical growth. In the next section, we show how we opened that participatory space in the final design of the course.

Bringing it Together: Putting Forth the CFS Course

Our experience with the pilot course complements the focus group data and lessons learned from the larger AFP community. With graduate student leadership from the AFP curriculum team, we titled the CFS course, "Food Security & Resilient Communities: Food Systems Theory and Practice" (FSRC). To enhance interdisciplinary learning, we created two courses to offer simultaneously at both Virginia Tech and North Carolina State University during the spring of 2015, with the intention of sharing the curriculum and opportunities for AFP faculty and community collaborations through guest speaking and course activities. The faculty leads from both universities created a shared calendar to bring the classes together virtually and in-person where possible while also allowing time for local, weekly discussions. While the course was advertised, there was not sufficient enrollment to constitute teaching the course at North Carolina State University; however, the FSRC course was offered at Virginia Tech. A total of 12 graduate students enrolled in the course from four departments across two different colleges that represented both M.S. and Ph.D. programs of study, including programs within the Departments of Agricultural and Applied Economics; Agricultural, Leadership, and Community Education; Crop and Soil Environmental Science; Public and International Affairs; and Food Science and

Technology.

The same AFP faculty member at Virginia Tech, and member of the AFP curriculum team who piloted the earlier food system course, led our FSRC course. Their interest to offer this new opportunity was elevated in collaborating with two AFP graduate students at Virginia Tech who served in a co-facilitation role. These two students were responsible for supporting classroom instruction and leadership with the AFP community throughout the semester. They did not have grading responsibilities per Graduate School policies that prohibit graduate students having access to graduate student grades. One of the students had taken the pilot course in 2013, while the other student was actively taking the new course. It is important to note that both students and the faculty member were able to draw upon their campus-community experiences in the regional AFP work, including lessons learned from conducting a community food security assessment in southwest Virginia.

We designed the syllabus using both instructor-determined and student-selected themes as a critical and interdisciplinary exploration of issues related to food security and the emerging discourse of food systems (see Appendix C for the syllabus summary). Following AFP partner interest, we also made it a priority to explore the role of university-community partnerships to enhance community food security and resiliency in our region. The Stories of Community Food Work in Appalachia initiative, as a component of the AFP, provided course participants with a theoretical and practical backdrop for class discussion, narrative research and storytelling, and first-hand engagement with food and farming scholar/practitioners in our region. Lastly, we collaborated virtually with our North Carolina State University AFP faculty member in a guest-speaking capacity to honor our commitment for developing new and interdisciplinary learning possibilities.

The first half of the course focused around seven predetermined and interconnected themes that built upon one another. For the first week, drawing upon Hamm (2009) and others, we discussed the notion of *food insecurity as a "wicked problem"* and explored participants' understanding

and meanings of food in/security as it relates to their personal and professional lives. This was crucial to build a sense of commonality and trust while acknowledging our differences in academic language, work contexts, and personal histories. We also covered the intersection of *food and foodways* as a cultural, social, and economic set of practices to provide students with a broad yet critical and shared language that resonated with our goals of creating an interdisciplinary learning space.

Our third and fourth themes were more theoretically demanding and included focusing on the connections between *neoliberalism and corporate food system control* coupled with *food security discourses and policy*. Here students delved into conceptual readings and policy documents that covered concepts and perspectives pertaining to household food security, community food security, food sovereignty, and resiliency. These paralleling themes helped us tap more deeply into course participants' historical and professional contexts related to food production and consumption agendas, underscoring their epistemological views and ontological realities about the food system itself.

For the fifth theme, we turned our attention to the complexities and possibilities of *sustainable food production* to address community food security and food sovereignty goals. Our collaborator in North Carolina State University took a central role this week and drew upon their agroecology research and sustainable agriculture education leadership using examples of international projects related to community food security. We also focused on key articles such as Holt-Giménez and Altieri (2013) and Holt-Giménez, Shattuck, Altieri, Herren, and Gliessman (2012) to help structure the conversation about the importance of framing food system issues and the role of science and policy in that framing. Here we emphasized the Global South and its colonial and radical histories pertaining to hunger, development, natural resources, and participatory processes to generate shared knowledge.

The six and seventh themes naturally fostered each other, spanning several weeks. Our students and AFP partners played an important role in exploring the *social change goals of CFS* as a social movement and the meanings and instances of *food*

justice through the lens of the Community Food Security Coalition and the Whole Measures for Community Food Systems (Abi-Naders et al., 2009). We also drew upon *Cultivating Food Justice*, a text edited by Alkon and Agyeman (2011). Class activities and discussions were largely dialogue-based and highlighted the ways race, class, and gender intersect and influence food system politics, which, in turn, permeates our relationship with food, the environment, and our identity. We invited AFP partners from the Virginia Tech campus and the communities near the university to participate in these discussions and provide an organizational anchor for conversation through examples of AFP project work related to our community food security assessment taking place across the region. Through in-depth, problem-posing dialogue (Freire, 2007) with student leadership, we were able to engage deeply about the ways low-wealth communities and communities of color in our region (and beyond) are historically and systemically marginalized from gaining access to healthy food, healthcare, transportation, and affordable housing. We especially focused on framing how race, class, and rural politics in the central Appalachian region influence CFS. The food justice theme not only provided a direct lens for the course but also served as a catalyst for the last half of the semester through the development and facilitation of student-led class readings and sessions.

Complete and committed participation was a core principle upon which the course operated. We used a variety of participatory methods and techniques, such as World Café and Open Space (Brown, 2002) methods to build and implement the last half of the semester as a nonhierarchical group of teachers/learners. We referred to this activity as "self-assigned readings and facilitation." This assignment required course participants to use a consent-based decision-making process to select themes and readings for the weeks in which students facilitated individual course sessions. Co-facilitation was required due to the number of course participants; students were grouped together to facilitate and select readings. As part of the activity, each group selected and disseminated theoretical or empirical readings one week before

their facilitation took place. Students then led the class the following week in an interactive session using their selected readings. Lastly, to receive a self-assigned grade, each participant provided a written critique of his/her/their facilitation one week after using a rubric the students co-developed and to which they consented. Our expectation for all student facilitators was to be prepared to lead a critique of the readings, challenge peers to think about meaning and application, and foster interactive and civil discourse about CFS and food system issues.

The students identified four overarching CFS themes using the World Café method, including *race, agriculture, and hunger*; the *nonprofit industrial complex*; *food security and asset-based community development (a programmatic approach)*; and *theories and strategies for food systems change*. Student leadership was central to this section of the course. Each week students organized role-plays, mapping exercises, critical dialogue using visual media, and discussion with article reviews. The class also produced a collective literature review to share with one another at the end of the semester.

As mentioned earlier, the community also played a pivotal role in the course. AFP partners from both the campus and community joined class sessions to talk about their role in the regional project and shared their perspectives about community food security and alternative food systems movement in the region. The course took one field trip to the City Schoolyard Garden, hosted by the executive director, Jeanette Abi-Nader. The City Schoolyard Garden is a nonprofit organization in Charlottesville that focuses on healthy and socially just food systems change with youth through garden-based experiential learning and leadership development. The graduate students took leadership in organizing a discussion about the Whole Measures for Community Food Systems (Abi-Nader et al., 2009) framework with Jeanette Abi-Nader and her City Schoolyard Garden team. Topics ranged from nonprofit organizing in the CFS movement to addressing social justice goals in the public school system. Our day concluded with a garden tour with the children at a local elementary school. This event took place in conjunction with the first-ever Virginia Farm to School

Conference. Our class served as facilitators of an Open Space session with 200 conference participants on the topic of food access and farm sustainability related to farm-to-school possibilities in Virginia. The students shared their ideas and organizing skills with producers, grassroots organizers, food nutrition directors, and governmental agency professionals. As part of the conference, we also had the opportunity to hear the First Lady of the Commonwealth of Virginia, Dorothy McAuliffe, share her vision for eliminating childhood hunger and improving access to fresh and healthy food for all Virginia residents.

Most notably, as a culminating course assignment, we continued the narrative-inquiry research project with AFP partners. This final assignment included students conducting a 90-minute narrative-based interview with a community practitioner, transcribing the interview, editing this interview for readability, analyzing the narrative by referring to course themes and literature, and sharing and co-editing the final transcript with the community partner. Here, we focused on the Whole Measures for Community Food Systems (Abi-Nader et al., 2009) as an analytical framework. As a values-based and community-oriented tool for evaluating and planning through dialogue, Whole Measures helped us see where food system change is possible. From this perspective, the narratives continued to help facilitate dialogue and a deeper understanding about how and why people from across the region, in a number of organizations and programs, including the university, are addressing the complexity of community food security. Our semester concluded with an evening “foodways” meal and reading session of the community narratives. This included a communal meal where everyone brought a food item to share that reflected how culture was expressed through their dietary habits. Students brought dishes that drew on memories of family recipes from around the Southern region and beyond, in addition to current meal options that represent trends in healthy eating and the pleasure of eating.

Student evaluations of the final course, both formal and informal, are important reflection points as we prepare to offer this course once again. While there are several measures to refer to,

we utilized both the standard university online course evaluation as well as a complementary qualitative evaluation instrument to provide us with several indications that students positively reacted to course content and our participatory praxis approach. First, we report that our overall course evaluation for score was an average of 5.9 out of 6 points, which was above the college average. This score accompanies another high score, which includes an average of 5.3 out of 6 points measuring the level in which students' interest in the subject matter was stimulated by the course. We also received a 5.3 average score indicating the depth of understanding students gained on the subject matter as a result of the course. These scores, plus high instruction scores (6 points out of 6) illustrate that students were satisfied with their course experience.

The university online course evaluation is standard for all courses, yet is limited in what information we can glean about the student learning experience. Therefore, we created and offered a qualitative evaluation instrument that each student filled out on the last day of class through an anonymous process that the students organized and implemented. The AFP curriculum team did not have access to these evaluations until the final course grades were submitted and processed, in accordance with Graduate School policy. From these evaluations, we learned more about what the students found useful and what changes they would recommend. For example, students shared that class discussions, critical reflection statements, student-led facilitation, and narrative assignment were essential to their learning experience. One student noted how they appreciated the design of the course:

I found the class to valuable, hearing what others had to say about readings and pulling from their experiences opened my mind to so many things I had never thought of. Most classes don't allow you that type of freedom, and I feel better for having that experience. The student-led facilitation was especially good, but I found it to be most enlightening to work from the AFP narrative project, the conversations that

stemmed from the planning process were wonderful.

Another student shared how they felt about the narrative assignment as their preferred learning experience:

The narrative assignment has been the most useful to me. I enjoyed having a larger assignment to dig my teeth into, and getting real life experience....I was able to develop better writing techniques and research skills while learning from someone in the field.

Also drawing upon the qualitative evaluations, we note that students referenced "agroecology" and "food justice" as their two favorite course topics and sources of readings throughout the semester. For instance, one student shared that "agroecology was a great topic because it brought in the agriculture part of food systems work." Several students also noted that these topics were new material to them, which was both welcome and yet challenging. To make this point these three students explicitly refer to food justice as the course topic that they found to be most beneficial or useful:

My favorite readings were on food justice. I learned the most from them because it had the most new information and took a critical approach to the CFS movement. I think food justice is a relevant and appropriate frame for the food security context we covered

Before I came here, I had never heard of "food security" or "social justice," and social justice issues discussed so much in a diverse group setting. The direction of the conversations were so very engaging, and I believe, eye opening for everyone. This class built a beautiful culture.

I feel like all of the readings were useful, but my favorite[s] were those readings on food sovereignty and food justice, as well as those readings which linked back to

historical/infrastructural concerns and policy.

In asking the students what they would recommend us doing differently to improve the course for enhanced student learning, we learned that they were very satisfied with the course as it was, knowing that in an ideal world we would have more time to cover more material. In fact, one student stated, “I think it is a perfect class. It includes everything I wanted.” Another student shared that the “class was good as it was.” However, the most common response (5 out of 12) was for us to incorporate more perspectives and readings that cover international or global food security issues. For example, one student wanted to “know more about how actual international trade agreements and subsidies work.” Another student expressed interest in “global food security and issues pertaining to developing countries.”

While we recognize that the evaluations only captured a glimpse of what the students learned or experienced, it continues to be important to us to explore what students not only learned but what they valued in respect to the course process and content. From this perspective, we note that several students are eager to return to share their experiences with a new class. This includes volunteering to guest-speak or facilitate with the next class to share their experiences and insights. It will take more time to see the impacts of this course; however, we are hopeful that the learning will transpire into new and affirming spaces as we work toward creating healthy and socially just food system change in our communities in and outside of the classroom.

Discussion and Conclusion

It was our goal to describe the participatory process we used to develop a graduate course centered on CFS with two institutions and stakeholder participation in central Appalachia. We emphasized the way in which graduate students played an active role in designing and participating in the course as one element of our participatory praxis, and how community-university engagement and action research opportunities were pivotal to course purpose, goals, and learning activities. To do so, we

provided an overview of the key concepts and ideas associated with CFS and community-university collaboration, paying special attention to action research and student-led inquiry as the foundation of our participatory praxis and how that relates to CFS graduate courses such as the one we describe in this paper. We then illustrated the course-design process and focus group findings that formed the basis of our curricular experience. This included an overview of the way we used course-based action research and student-led (and graded) facilitation as central component to the courses.

We put forth that our participatory education and critical pedagogy approach reflects our participatory praxis commitment to engage student and community experience and voice. We believe course participants were able to imagine and place their own professional and personal contexts as central elements to construct what Freire (2007) refers to as a critical consciousness, which, he further argues, provides the necessary foundation for developing a transformative educational experience. For us, this consciousness is centered around food system politics and CFS.

This praxis, however, is also based on our ability to critically and deeply reflect on our own experiences and positions in the food system. To cultivate this reflection process, we strived to build a classroom environment based on understanding and transparency where food became the central cultural practice. Therefore, we suggest that a participatory praxis requires a commitment to learning with and from each other, breaking down hierarchical patterns and practices, and accepting that this learning is a politicized act. CFS is a social movement with ties to newer and more progressive movements whose goals are about unlearning the injustice that is rooted in our food system. Taking a participatory and critical pedagogy approach to the question of food access, availability, and affordability focuses our learning on the change we hope to see and continue to cultivate.

We understand that this overall approach comes with limitations and challenges when applied to a university, college, or continuing education context and developing and teaching courses. Instead of highlighting all the potential

challenges, we chose to reflect on what might have made our FSRC course successful to emphasize the application of CFS and participatory praxis principles. First, it was fundamental that we had an existing CFS project, the AFP project in this case. The existing CFS project allowed students to engage with real-life food security challenges and the stakeholder groups working toward change in their surrounding community through the course. The CFS project offered opportunities for students to participate directly in gathering research data and learning methods and techniques with quantitative and qualitative data. Community partners were also already engaged around CFS and participating in democratic collaborations with university faculty. Students were included in these partnerships straightaway, which reduced the time required to build important relationships with the community. Further, students brought enthusiasm, new perspectives, and offered novel approaches to the activities that community participants had identified as important. Second, it was important that community stakeholders were actively involved in co-developing course activities with the students and faculty. The Stories of Community Food Work in Appalachia initiative is an example of an important product of this course that illustrates all these points. Community members described that their roles and work were important and mutually beneficial. Collaborating with the students through a creative approach helped them share their stories with a larger audience while also providing a space for students to learn community engagement and research skills. Additionally, we wish to note that a course like this requires a high level of time commitment to develop and facilitate. This may be an issue in some university or college contexts that may not historically support or

advance participatory and community-engaged approaches within the classroom. We feel fortunate that our institutions and college administrations have been supportive of this course and courses like it that emphasize student-community engagement. Lastly, it was important in our course development and teaching that students be respected as active participants in their learning—as democratic partners. We sought to understand why a student would enroll in a course like this and what they really wanted to know and achieve in the course that covered both content and professional development. The focus groups and a pilot course helped us understand this in the course development process, but part of the course syllabus was intentionally left blank so those students who enrolled could collectively design and decide what was important to them. This takes a great amount of flexibility on the part of the instructor, who becomes a facilitator of learning, breaking down the power dynamics between faculty and students typical in other classes. We feel all of these components played a critical part in the success of this course and ultimately success in engaging students and building their knowledge and skills in the important area of community food security education.

Be critical, but don't be poison. Find the positive.

—Reflection about food justice
from a student evaluation

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References

- Abi-Nader, J., Ayson, A., Harris, K., Herrera, H., Eddins, D., Habib, D.,... Villanueva, L. (2009). *Whole measures for community food systems: Values-based planning and evaluation*. Retrieved from <http://measuresofhealth.net/index.shtml>
- Allen, P. (2004). *Together at the table, sustainability and sustenance in the American agrifood system*. University Park: Pennsylvania State University Press.
- Allen, P. (2010). Realizing justice in local food systems. *Cambridge Journal of Regions, Economy and Society*, 3(2), 295–308. <https://dx.doi.org/10.1093/cjres/rsq015>
- Alkon, A. H., & Agyeman, J. (Eds.). (2011). *Cultivating food justice: Race, class and sustainability*. Cambridge, Massachusetts: MIT Press.

- Anderson, M. D., & Cook, J. T. (1999). Community food security: Practice in need of theory? *Agriculture and Human Values*, 16(2), 141–150. <https://dx.doi.org/10.1023/A:1007580809588>
- Barndt, D. (2012). Catalyzing creativity: Education and art feed the food justice movement. In M. Koç, J. Sumner, & A. Winson (Eds.), *Critical perspectives in food studies* (pp. 65–88). Don Mills, Ontario, Canada: Oxford University Press.
- Brown, J. (2002). *A resource guide for hosting conversations that matter at the World Café*. Retrieved from http://www.meadowlark.co/world_cafe_resource_guide.pdf
- Buck, J., & Villines, S. (2007). *We the people: Consenting to a deeper democracy*. Washington, D.C.: Sociocracy.info Press.
- Carney, P. A., Hamada, J. L., Rdesinski, R., Sprager, L., Nichols, K. R., Liu, B. Y.,...Shannon, J. (2012). Impact of a community gardening project on vegetable intake, food security and family relationships: A community-based participatory research study. *Journal of Community Health*, 37(4), 874–881. <https://dx.doi.org/10.1007/s10900-011-9522-z>
- Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge and action research*. Victoria, Australia: Deakin University Press.
- Clark S., Byker, C., Niewolny, K., & Helms, J. (2013). Framing an undergraduate minor through the civic agriculture and food systems curriculum. *NACTA Journal*, 57(2), 56–67. Retrieved from <https://www.nactateachers.org/index.php/volume-57-num-2-june-2013/2070-framing-an-undergraduate-minor-through-the-civic-agriculture-and-food-systems-curriculum>
- Cooke-Sather, A., Bovill, C., & Felten, P. (2014). *Engaging students as partners in learning and teaching: A guide for faculty*. San Francisco: Jossey-Bass.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd Ed.). Thousand Oaks, California: Sage Publications.
- Embry, O., Fryman, D., Habib, D., & Abi-Nader, J. (2012). *Whole measures for community food systems: Stories from the field*. Retrieved from <http://wholecommunities.org/wp-content/uploads/2015/12/WholeMeasuresStories-copy-2.pdf>
- Fisher, A. & Gottlieb, R. (1995). *Community food Security: Policies for a more sustainable food system in the context of the 1995 Farm Bill and beyond*, Lewis Center for Regional Policy Studies, University of California, Los Angeles.
- Freire, P. (2007). *Pedagogy of the oppressed*. New York: Continuum.
- Galt, R. E., Clark, S. F., & Parr, D. (2012). Engaging values in sustainable agriculture and food systems education: Toward an explicitly values-based pedagogical approach. *Journal of Agriculture, Food Systems and Community Development*, 2(3), 43–54. <https://dx.doi.org/10.5304/jafscd.2012.023.006>
- Galt, R. E., Parr, D., Van Soelen, J. K., Beckett, J., Lickter, M., & Ballard, H. (2013). Transformative food systems education in a land-grant college of agriculture: The importance of learner-centered inquiries. *Agriculture and Human Values*, 30(1), 129–142. <https://dx.doi.org/10.1007/s10460-012-9384-8>
- Greenwood, D. J., & Levin, M. (Eds.). (2007). *Introduction to action research: Social research for social change* (2nd Ed.). Thousand Oaks, California: Sage Press. <https://dx.doi.org/10.4135/9781412984614>
- Hamm, M. W. (2009). Principles for framing a healthy food system. *Journal of Hunger and Environmental Nutrition*, 4(3–4), 241–250. <https://dx.doi.org/10.1080/19320240903321219>
- Hamm, M. W., & Bellows, A. C. (2003). Community food security and nutrition educators. *Journal of Nutrition Education and Behavior*, 35(1), 37–43. [https://dx.doi.org/10.1016/S1499-4046\(06\)60325-4](https://dx.doi.org/10.1016/S1499-4046(06)60325-4)
- Hofman, N. G., & Rosing, H. (Eds.). (2007). *Pedagogies of praxis: Course-based action research in the social sciences* (1st Ed.). Bolton, Massachusetts: Anker Publishing.
- Holt-Giménez, E., & Altieri, M. A. (2013). Agroecology, food sovereignty, and the new Green Revolution. *Agroecology and Sustainable Food Systems*, 37(1), 90–102. <http://dx.doi.org/10.1080/10440046.2012.716388>
- Holt-Giménez, E., Shattuck, A., Altieri, M., Herren, H., & Gliessman, S. (2012). We already grow enough food for 10 billion people...and still can't end hunger. *Journal of Sustainable Agriculture*, 36(6), 595–598. <https://dx.doi.org/10.1080/10440046.2012.695331>
- Hudd, S. S. (2003). Syllabus under construction: Involving students in the creation of class assignments. *Teaching Sociology*, 31(2), 195–202. <https://dx.doi.org/10.2307/3211308>

- Ibáñez-Carrasco, F., & Riaño-Alcalá, P. (2011). Organizing community-based research knowledge between universities and communities: Lessons learned. *Community Development Journal*, 46(1), 72–88.
<https://dx.doi.org/10.1093/cdj/bsp041>
- Israel, B. A., Eng, E., Schulz, A. J., & Parker, E. A. (Eds.). (2005). *Methods in community-based participatory research for health*. San Francisco: Jossey-Bass.
- Jacobsen, K. L., Niewolny, K. L., Schroeder-Moreno, M. S., Van Horn, M., Harmon, A. H., Chen Fanslow, Y. H., ... Parr, D. (2012). Sustainable agriculture undergraduate degree programs: A land-grant university mission. *Journal of Agriculture, Food Systems, and Community Development*, 2(3), 13–26.
<https://dx.doi.org/10.5304/jafscd.2012.023.004>
- Joseph, H. (Ed.). (1997). *Community food security: A guide to concept, design, and implementation*. Retrieved from <http://alivebynature.com/CFSguidebook1997.pdf>
- Julier, A. P. (2015, May). *Critiquing hegemony, creating food, creating justice: Cultivating an activist food studies*. Food Studies Symposium keynote at the annual meeting of the Canadian Association for Food Studies, University of Ottawa, Ontario, Canada.
- Kunkler, T. (2017). What is Circle Forward? Retrieved from <http://www.circleforward.us/what-is-circle-forward/>
- Lather, P. (1991). *Getting smart: Feminist research and pedagogy with/ in the postmodern*. New York: Routledge.
- Levkoe, C., & Wakefield, S. (2011). The Community Food Centre: Creating space for a just, sustainable, and healthy food system. *Journal of Agriculture, Food Systems and Community Development*, 2(1), 249–268.
<https://dx.doi.org/10.5304/jafscd.2011.021.012>
- McCullum, C., Pelletier, D., Barr, D., & Wilkins, J. (2002). Use of a participatory planning process as a way to build community food security. *Journal of the American Dietetic Association*, 102(7), 962–967.
[https://dx.doi.org/10.1016/S0002-8223\(02\)90220-8](https://dx.doi.org/10.1016/S0002-8223(02)90220-8)
- Meek, D., & Tarlau, R. (2016). Critical food systems education (CFSE): Educating for food sovereignty. *Agroecology and Sustainable Food Systems*, 40(3), 237–260. <https://dx.doi.org/10.1080/21683565.2015.1130764>
- Minkler, M. (2000). Using participatory action research to build healthy communities. *Public Health Reports*, 115(2–3), 191–197. <http://journals.sagepub.com/home/phr>
- Muhr, T. (2004). *User's manual for ATLAS.ti 8.0*. ATLAS.ti Scientific Software Development GmbH, Berlin.
- National Research Council. (2009). *Transforming agricultural education for a changing world*. Washington, D.C.: The National Academies Press.
- Nelson, E., & Dodd, W. (2016). Collaborating for community food security: Emerging scholar participation in a community–university partnership. *Action Research*. Advance online publication.
<https://dx.doi.org/10.1177/1476750316656041>
- Niewolny, K. (2016). Stories of community food work in Appalachia: Opening space for storytelling and learning. Retrieved from <http://blogs.lt.vt.edu/niewolny/>
- Niewolny, K. L., & D'Adamo-Damery, P. (2016). Learning through story as political praxis: The role of narratives in community food work. In J. Sumner (Ed.), *Learning, food, and sustainability: Sites for resistance and change* (pp. 113–131). New York: Palgrave Macmillan.
- Niewolny, K. L., Grossman, J. M., Byker, C. J., Helms, J. L., Clark, S. F., Cotton, J. A., & Jacobsen, K. L. (2012). Sustainable agriculture education and civic engagement: The significance of community-university partnerships in the new agricultural paradigm. *Journal of Agriculture Food Systems, and Community Development*, 2(3), 27–42.
<https://dx.doi.org/10.5304/jafscd.2012.023.005>
- 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 Science Education*, 40(1), 172–180.
<https://dx.doi.org/10.4195/jnrlse.2009.0047u>
- Parr, D. M., Trexler, C. J., Khanna N. R., & Battisti, B. T. (2007). Designing sustainable agriculture education: Academics' suggestions for an undergraduate curriculum at a land grant university. *Agriculture and Human Values*, 24(4), 523–533. <https://dx.doi.org/10.1007/s10460-007-9084-y>

- Patel, R. (2009). Food sovereignty. *Journal of Peasant Studies*, 36(3), 663–706.
<https://dx.doi.org/10.1080/03066150903143079>
- Pothukuchi, K. (2004). Community food assessment: A first step in planning for community food security. *Journal of Planning Education and Research*, 23(4), 356–377. <https://dx.doi.org/10.1177/0739456X04264908>
- Pothukuchi, K., Seidenburg, K., & Abi-Nader, J. (2007). *Building community food security: Lessons from community projects, 1999–2003*. Retrieved from <https://nesfp.org/cfsc-resources>
- Reardon, K. M. (1998). Participatory action research as service learning. *New Directions for Teaching and Learning*, 1998(73), 57–64. <https://dx.doi.org/10.1002/tl.7307>
- Reason, P., & Bradbury, H. (Eds.). (2008). *The SAGE handbook of action research: Participative inquiry and practice* (2nd Ed.). Thousand Oaks, California: Sage Publications.
- Shafaei, A., & Nejati, M. (2012). Does students' empowerment influence their commitment? *International Journal of Education Economics and Development*, 3(4), 303–315. <https://dx.doi.org/10.1504/IJEED.2012.052311>
- Strand, K. J. (2000). Community-based research as pedagogy. *Michigan Journal of Community Service Learning*, 7(1), 85–96. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0007.110>
- Strand, K., Marullo, S., Cutforth, N., Stoecker, R., & Donohue, P. (2003). Principles of best practice for community-based research. *Michigan Journal of Community Service Learning*, 9(3), 5–15. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0009.301>
- Tanaka, K., & Mooney, P. H. (2010). Public scholarship and community engagement in building food security: The case of the University of Kentucky. *Rural Sociology*, 75(4), 560–583. <https://dx.doi.org/10.1111/j.1549-0831.2010.00029.x>
- Thompson, N., & Pascal, J. (2012). Developing critically reflective practice. *Reflective Practice: International and Multidisciplinary Perspectives*, 13(2), 311–325. <https://dx.doi.org/10.1080/14623943.2012.657795>
- Weber, E. (2011). Transforming higher education: Action research, learning and community politics. *Africa Education Review*, 8(1), 1–16. <https://dx.doi.org/10.1080/18146627.2011.286138>
- Winne, M. (2008). *Closing the food gap: Resetting the table in the land of plenty*. Boston, Massachusetts: Beacon Press.

Appendix A. IRB Approved Focus Group Questions Organized by Course Design Topics

Key Topics	Questions
Defining Food Security	<ol style="list-style-type: none"> 1. How would you define the notion of food security? 2. What interested you about taking a course on Community Food Security?
Course Content	<ol style="list-style-type: none"> 3. What issues come to mind when you think about Community Food Security? 4. Please refer to the list of topics on the second handout we provided. Given these topics related to community food security, what are the top 5 that interest you most? <ul style="list-style-type: none"> • Food security and community food security definitions and comparisons • Food sovereignty • Multidisciplinary perspectives on food systems • Causes of food insecurity • Food security and community food security assessments • Food access and health impacts • Food justice (issues of gender, race, class, etc.) • National policies associated with food security • International policies associated with food security • Interaction of sustainable agricultural production with food security • Case studies of real world examples of food secure and/or food insecure communities • Food assistance
Course Activities and Assessments	<ol style="list-style-type: none"> 5. Most classes have some type of assessment to gauge student learning. What types of class activities would you find meaningful to enhance your understanding in a community food security course? 6. What are your views on using experiential learning opportunities with a community partner in a food security course?

Appendix B. Institutional Review Board (IRB)–Approved Final Course Evaluation Questions

By completing this voluntary course evaluation, you consent to the use of your confidential and anonymous feedback to be applied to future course improvements and potential research publications about the course. Your comments will remain sealed until after final grades are entered. Each response will be held confidential at all times. Once complete, please return to your student lead for collecting. Thank you.

1. What component(s) of the course (e.g., readings, guest speakers, class discussions, site visits, student-led facilitation, narrative inquiry research project, and critical reflection statements) did you find the most valuable as a learner? Please list and explain why.
2. What course topic(s) and/or reading(s) did you find the most beneficial as it pertains to understanding food security definitions and concepts? How so?
3. What course topic(s) and/or reading(s) did you find the most useful as it pertains to applying new concepts and strategies in your professional/scholarly practice? Please explain.
4. If time permitted, what topic(s) would you recommend adding to the course (or doing more of) to best meet course learning objectives? Please explain why.
5. Overall, what would you recommend doing differently to improve the course for enhanced student learning? Briefly explain what these changes might look like and/or where they might be inserted in the syllabus.
6. As you complete your narrative research assignment, you may find yourself seeking some inspiration. What is more inspiring than a self-made *t-shirt*? Use the space below to “design” a t-shirt that best reflects your newly acquired understanding of “food security” or “food systems.” Because space is limited, you must choose the most insightful idea, thought, or concept that most accurately illustrates this new learning. What would your t-shirt look like or say...?⁴

⁴ We would like to acknowledge Dr. Arthur Wilson for the use of this question, which is derived from a course evaluation he designed and implemented at Cornell University.

Appendix C. Syllabus Summary by Objectives, Themes, and Assessment

Food Security & Resilient Communities: Food Systems Theory & Practice

Virginia Tech

ALCE 5984

Spring 2015

Instructor:

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Course Overview

This graduate-level course is a critical and interdisciplinary exploration of current issues related to food security and the emerging discourse of food systems. This course will focus on the concepts of food security, community food security, food sovereignty, resiliency, and agricultural sustainability from local, regional, and international perspectives. Topics include but are not limited to: conceptual and programmatic approaches to addressing food security, food security policy, food system assessment, and the role of university-community partnerships to enhance food security and resiliency in communities. The Appalachian Foodshed Project (AFP) will provide course participants with a theoretical and practical backdrop for class discussion and coursework, including engaging with AFP scholar/practitioners and visiting the region. This course also involves collaborating with AFP colleagues at North Carolina State University. Participatory learning and asset-based community development are also relevant course themes. Graduate student standing only (3H, 3C).

Learning Objectives

Having successfully completed this course, students should be able to:

- Define, analyze, and articulate theories, practices, and policies pertaining to the emerging field of food systems
- Define and critique conceptual and programmatic definitions of and approaches to enhance food security local, regionally, and internationally.
- Define and critique scholar/ practitioner participation as change agents in the food system.
- Incorporate food system/security concepts and strategies into personal and professional practice for socially just ends.

continued

Course Justification
In this graduate course, students will identify, analyze and address the interconnectedness of food systems from sociopolitical, economic, ecological perspectives. We will explore the many complex and often challenging issues, as a wicked problem, related specifically to food security—what we do/don’t eat and why/why not, how food is produced and distributed, and who benefits (and doesn’t) from these experiences and processes. Educational and community development agendas are at the heart of this dialogue. A major component of this course is to explore the conceptual grounding and practical applications of the Appalachian Foodshed Project (AFP), a USDA-NIFA, AFRI Grant Program (Award Number: 2011-68004-30079). The AFP uses a foodshed concept to address issues of community food security in West Virginia and the Appalachian regions of North Carolina and Virginia. Through multiple levels of research, outreach, and educational efforts, the AFP aims to facilitate a network of organizations and individuals working to address issues of community development, economic viability, health, nutrition, food access, social justice, and agriculture. By working collaboratively across the region, the AFP hopes to build capacity and cultivate resilient food systems and vibrant, healthy communities.
Primary and Secondary Course Themes Synthesized from Syllabus
<i>Overview of Food Systems and Food Security</i> — “Wicked Problems”
<i>Food and Foodways</i> — Cultural, Historical, Social, and Economic Intersections
<i>Industrialization and Globalization of Agriculture and Food Systems</i> — Corporate Food Regime — Neoliberalism and the Food System
<i>Food Security Definitions, Discourses, & Policy</i> — Household Food Security; Community Food Security; Food Sovereignty — Resiliency — Domestic and International Perspectives
<i>Sustainable Food Production and Food Security</i> — Agroecology and Sustainability — Food Security and the Green Revolution(s) — Global Food Security and Food Production
<i>Food Systems, Social Change, and Community Resilience</i> — Whole Measures for Community Food Systems — Community-based Food System Assessments
<i>Food Justice & Community Food Security</i> — Exploring What/Why/How Food Justice — Food In/security and Access (Whose justice?)
<i>Food Justice & Community Food Security (continued)</i> — Food Justice in the Appalachian Region
<i>Race, Agriculture, and Hunger</i> — student choice
<i>Addressing the Non-Profit Industrial Complex</i> — student choice
<i>Food Security & Asset-based Community Development (Programmatic Perspective)</i> — student choice
<i>Theories and Strategies for Food System Change</i> — student choice

continued

Community-Engagement Activity
Appalachian Foodshed Project Guest Speakers from Virginia and North Carolina
Narrative Inquiry Research Project with AFP Stakeholders: “Stories of Community Food Work in Appalachia”
Visit to City Schoolyard Garden hosted by Jeanette Abi-Nader: “A conversation about the <i>Whole Measures for Community Food Systems</i> ”
Participation in Virginia Farm to School Conference: “Open Space Session Facilitators”
Course Assessment and Assessment Responsibility
Weekly Critical Reflection Papers (25%) — Professor Assessment
Student Led-Facilitation (25%) — Student Self-Assessment
AFP Practitioner Narrative Inquiry Research Project (30%) — Practitioner & Professor Assessment
AFP Practitioner Narrative Inquiry Research Project (30%) — Practitioner & Professor Assessment

Time and technique assessments of labor productivity on diversified organic vegetable farms using a comparative case study approach

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Abstract

As regional food purchasing continues to gain consumer interest, an increasing number of diversified vegetable farms have emerged to meet market demand. Many of the small- and midscale vegetable farms selling into local markets, however, face continued challenges concerning the financial decision-making and the viability of their operations. Greater understanding of the consequences

of financial, labor, and production-management decisions has the potential to improve the long-term success of these farms. In this exploratory work utilizing a comparative case study approach involving 10 diversified vegetable farms, we conducted time and technique studies to assess labor productivity as related to different farm labor and production management decisions. We focused our analysis on three specific activities (transplanting, harvest, and postharvest handling) for five common crops (broccoli, carrots, lettuce, peppers, and squash). Our results showed tremendous farm-to-farm variation in labor productivity, reflecting the diversity of approaches to production and

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management. Both mechanization and farm size influenced the time required to complete production and postharvest activities; however, these relationships were not consistent across all crops and activities. While time and technique studies can help farmers to more effectively strategize innovations in production practices and equipment purchases, farm-specific considerations such as crew size, farm land base, and worker welfare will remain important factors for farmers in assessing the consequences of mechanizing any process and of changing their particular management strategy, as well as the appropriateness of adopting technologies in the context of farm scale and resources. Challenges and weaknesses associated with on-farm participatory time and technique studies were identified, leading to recommendations to create a more feasible system for similar data-collection efforts. The data generated by further expansion on our approach can provide diversified vegetable farmers, food system development professionals, and policy-makers with an additional information to contribute to the successful growth and financial status of diversified vegetable farms serving as vital components of strong local and regional food systems.

Keywords

Time and Technique Studies; Cost of Production; Organic Agriculture; Diversified Vegetable Farming; Local and Regional Food Systems; Scaling Up

Introduction

Vegetable farms make up an important sector of regional food markets, representing almost a third of local food sales (Low et al., 2015). Despite the growth of local and regional food systems, many small- to midscale vegetable farms provide low wages to both farmers and their farm employees, thus providing minimal incentive for additional farmers to enter these expanding markets. According to the 2012 Census of Agriculture, of the 163,675 “local food farms” selling into regional markets, 85 percent had a gross cash farm income below US\$75,000, and only five percent had a gross cash farm income above US\$350,000 (U.S. Department of Agriculture [USDA], 2012). While,

except at the bottom of the range, gross income may not reflect the net returns on these farms, many farmers may not adequately account for their labor when estimating production expenses, thus insufficiently pricing their product to allow themselves to earn a living wage (Oberholtzer, 2004; Ostrom, 2007; Schreck, Getz, & Feenstra, 2006; Tegtmeier & Duffy, 2005). In addition to other key factors (such as market-driven price ceilings), underestimated and undervalued labor costs can contribute to farm owner hourly wages falling as low as US\$3.60 per hour (Berkey, 2015; Galt, Christensen, Bradley, Simpson, & Munden-Dixon, 2015; Hendrickson, 2005; Ostrom, 2007). Practical production cost estimation tools can help enable diversified vegetable farmers, food system development professionals, and policy-makers to assess the economic viability of farms and to identify practices that can strengthen farm profitability and, more broadly, our local and regional food systems.

Estimating labor needs is an important component of strategic growth of farms, with several studies demonstrating the difficulty in profitably managing labor needs at an intermediate scale (Hendrickson, 2005; Silva, Claypool, Munsch, Hendrickson, Mitchell, & Mills, 2014). In his study of 19 Midwestern vegetable farms, Hendrickson (2005) observed that the midscale farm was, perhaps, a more difficult scale to maintain profitability as compared to other scales of diversified vegetable farms. The midscale farms, ranging from three to 12 acres (1.2 to 4.9 hectares), had the lowest three-year average annual gross sales of the three scales of farm, at US\$11,121 per acre. The midscale farms also had notably higher hours per acre of labor inputs as compared to larger-scale farms, and a higher percentage of labor hours performed by the owner than either small-scale “market gardens” or larger-scale farms. Together, these three observations (decline in average gross sales, higher labor hours per acre, and higher owner labor hours) illustrate the challenge of balancing labor costs and management at the intermediate scale of diversified vegetable farming. Yet this scale of farm is a critical element in the continued growth and stability of regional food purchasing. These challenges may be offset by scale-appropriate and cost-effective technologies for this farm size (Revkin, 2014), as well

as by policies that encourage markets, price structures, and purchasing agreements to support mid-scale diversified vegetable farms (Daniels, 2017).

The importance of labor-cost accounting in price determination on diversified vegetable farms is further amplified by the relative proportion of this expense to the overall cost of production. Studies documenting the costs of production on diversified vegetable farms have shown that labor accounts for a significant proportion of the costs, making up 65 to 75 percent on diversified vegetable farms versus 42 percent of production expenses on specialized vegetable farms (Ali & Lucier, 2008; Calvin & Martin, 2010; Chase, 2012; Hardesty, 2007; Hendrickson, 2005; Le Roux, Schmit, Roth, & Streeter, 2010). Labor inputs can vary widely across diversified vegetables farms, as shown by a study conducted by Hendrickson (2005) that documented ranges from 187 to 1,211 labor hours per ha⁻¹. These differences are affected by a host of factors, including variation in production and marketing approaches, farm size, and level of mechanization (Lohr & Park, 2009). Additionally, defining a standard value for labor costs associated with the production of specific crops on diversified vegetable farms may not be particularly useful due to variation in the managerial ability of farmers and/or farm employees; labor inputs are not only influenced by the size of labor crews designated to production and harvesting tasks, but also by the wide knowledge and skill base of operators, managers, and workers (Buck, Getz, & Guthman, 1997; Escalante & Santos, 2010; Hendrickson, 2005; Navarrete, Dupré, & Lamine, 2015; Pates & Artz, 2014).

Labor needs, and the related estimation of labor costs, on diversified vegetable farms are further influenced by a farm's level of mechanization. Mechanization tends to be more prevalent on farms with more specialized (rather than diverse) crop portfolios (Pates & Artz, 2014). Few studies have been conducted on the relationship between mechanization and growth of diversified vegetable farms, and the subsequent impacts on labor costs. In their study of Midwestern vegetable farms, Pates and Artz (2014) found that increased mechanization was associated with an overall increase in farm size. Decreased costs, reduced effort, improved

timeliness of operations, labor cost savings, and mitigation of the lack of viable hand labor alternatives were cited by farmers as important factors in their decision to mechanize. Mechanization did not completely eliminate the need for labor, particularly during harvest, nor did it always have significant labor or cost savings.

Enterprise budgets have been a standard tool for evaluating production costs on farms and have served as economic decision-making tools for farmers (Connor & Rangarajan, 2009). However, adopting generalized enterprise budgets may not be the most appropriate approach to evaluating the costs of production associated with the highly diversified and complex cropping practices that characterize diversified farms selling into multiple market channels. Much of the variability related to differences in cropping and production strategies results from management differences leading to different labor needs and efficiencies, which can significantly affect the accuracy of generalized enterprise budgets as compared to the realized values for a given farm. As labor costs compose a significant proportion of the costs of production on diversified vegetable farms, this factor creates significant variation in a given farm's calculated break-even prices. As an alternative, farm-specific cost-of-production evaluations may offer more appropriate and accurate information to guide the financial assessment of these operations, and subsequent decisions to improve profitability. The need for developing a more specialized approach to determine costs of production on diversified vegetable farms is heavily documented in recent scholarship and has also been cited as a priority by many farmers (Bozoğlu & Ceyhan, 2007; Conner & Rangarajan, 2009; Jacobsen, Escalante, & Jordan, 2010; Hendrickson, 2005; Silva et al., 2014).

As an alternative to more standard enterprise budgets, time studies offer a different approach to assessing labor inputs and costs on diversified vegetable farms. Numerous non-agricultural industries measure labor productivity using time studies, which estimate the time required to complete cycles of work. Such studies can inform strategies for improving overall productivity and profit, while also providing guidance for ergonomic interventions or other modes of assistance for workers.

While little literature exists on using time studies in agriculture, the methodology developed by the U.S. Department of Labor uses the technique in investigations of workplace compliance with labor laws. This methodology involves (1) identifying the components, tasks, and subtasks to be performed, including methods and procedures used to accomplish the respective tasks and types of equipment and supplies to be used; (2) determining a definite start and stop point for the task; and (3) timing the entire job cycle, including all preliminary activities (set-up time) and all postliminary duties (stowing of materials and equipment) to be performed on the job by the workers (U.S. Department of Labor, 2016).

The objective for this overall project was to assess labor productivity on working certified organic vegetable farms in Wisconsin, across a range of farm scales and levels of mechanization, using time and technique assessments within a comparative case study approach on 10 diversified vegetable farms, while concurrently identifying the strengths and weaknesses of this approach. The longer-term goals of this project were two-fold: (1) to begin to develop methodology that can be utilized by agricultural and food system professionals, as well as farmers, to assist local and regional food producers in making informed production decisions on their farms to improve the financial viability of their operations; and (2) to begin to devel-

op benchmark values that can guide farmers regarding best management practices, mechanization purchases, and scaling-up decisions for their farms. With this information, we aimed to provide diversified vegetable farmers, food system development professionals, and policy-makers with an additional tool and source of data to contribute to the successful growth and financial status of these farms serving as vital components of strong local and regional food systems.

Methods

The methods of this study were approved by the University of Wisconsin-Madison's Institutional Review Board (IRB No. 2014-0885). To conduct time studies across a diverse representation of operations, labor data were collected on 10 certified organic diversified vegetable farms in Wisconsin, USA, throughout two production seasons, 2014 and 2015 (Table 1). Farmers were recruited initially using communication through the Fairshare Community Supported Agriculture Coalition (Madison, Wisconsin); from the first farms that volunteered for the study, additional farms were recruited using snowball sampling techniques. Farms were included to reflect a range of production scales, levels of mechanization, and management approaches representative of upper Midwestern organic farms. This included three small farms defined as 0 to 3 acres (0 to 1.2 ha),

Table 1. Demographic Profiles of 10 Certified Organic Diversified Vegetable Farms in Wisconsin, USA, Included in the Time and Technique Data Collection Efforts, 2014 and 2015

Farm	Farm size	Acres in vegetables	Farmer gender(s)	Age range	Years farming	CSA shares
A	Medium	7.0	Male	50+	20+	n/a
B	Medium	4.0	Male	40–49	10–20	450
C	Large	20.0	Male & Female	30–39	10–20	350
D	Small	1.5	Male & Female	20–29	6–10	36
E	Large	48.0	Male	30–39	10–20	440
F	Large	45.0	Male & Female	50+	20+	478
G	Medium	5.5	Male	30–39	6–10	168
H	Small	3.0	Female	50+	20+	33
I	Small	2.5	Male	20–29	>5	112
J	Medium	5.5	Male	20–29	6–10	195

Note: 1 acre=0.4 ha

four medium farms defined as 4 to 10 acres (1.6 to 4 ha), and three large farms defined as 10 to 50 acres (4 to 20.2 ha). All farms had a community supported agriculture (CSA) component to their operation, but varied in the other market avenues with which they engaged.

Time and technique studies were designed to measure the labor required for three specific model activities, selected for the relative standardization of practices across a wide range of farms: transplanting, harvesting, and postharvest handling (washing and packing). These activities were observed for five crops: broccoli, head lettuce, carrots, bell peppers, and summer squash; these crops were chosen to represent a diversity of crop families, growth habits, seasonality, and production and harvest techniques. We also measured the time required to pack CSA boxes. Activities for which we collected data, while not encompassing all aspects of farm operations, were chosen in consultation with a farmer advisory committee, which identified these points in production as key elements for strategic labor management. The observations for each activity by crop are enumerated in Table 2. Data were collected when activities represented large hired-labor needs during a growing season (e.g., during peak harvests and planting times) in order to best capture the impact of farm management strategies on labor productivity. Farmers communicated with the research team to schedule data collection for key events related to different activities. Data collection was avoided during extreme weather conditions (e.g., storms or extraordinary heat) to avoid the impact of extreme weather on labor productivity.

Data were collected using a cyclical measurement model, similar to the methodology used in the U.S. Department of Labor time studies. With a high degree of variability in labor efficiencies hypothesized to exist across farms, we collected data in “pulses” across the common activities described above, to compare labor efficiencies most effectively across farms of different scales, levels of mechanization, and employee management strategies, with the goal of estimating of labor productivity gains or losses across these different variables. A pulse was defined as one discreet activity for one crop (e.g., transplanting

lettuce or harvesting carrots). For each pulse, we recorded the total time required to complete the pulse, as well as the time to complete shorter subsections of the pulse. We collected the time to complete each activity for every crop included in the study, plus CSA box packing. The time to complete each activity, not including travel to the field or idle time, was measured with stopwatches by research program staff who visited the farms while activities were occurring. A summary of the number of observations collected per activity and crop category (pulses) is included Table 2.

In addition to the time for completion of task, we recorded other production metrics, including appropriate unit of vegetable yield handled in a pulse (and in each individual trial); number of transplants and row feet for transplanting; units of vegetable harvested for harvest; units of vegetable washed and packed for postharvest; and number of boxes packed for CSA packing. We also collected other descriptive information on the methods (hand or machine) and techniques employed. Quantitative and qualitative characteristics with respect to the work force included crew size, experience (number of seasons employed), presence of crew leaders, presence of volunteers or worker-shares, presence of farmer-owner, and division of labor. Additional variables, including environmental conditions and market channels, were also noted. A complete list of data categories can be found in Table 3.

Interviews with the participating farmers provided supplemental information on farm management, farmer experience, crew numbers and experience, wages, market channels, and pricing. This information provided more context for each farm when interpreting efficiencies and differences between operations.

Data were analyzed to assess four measures of labor productivity: time per output, time per output per person, output per hour, and output per hour per person. The first two measures (time per output and time per output per person) contain the same information as the last two measures (output per hour and output per hour per person), since the measures are simply reciprocals of one another. While the participating farmers found that data summaries in the form of time per output and time

per output per person were more meaningful for their decision-making processes, measurements stated as output per hour and output per hour per person are more frequently used conventional measures of labor productivity by other industries (U.S. Department of Labor, 2016).

For transplanting activities, time per 100 row feet transplanted, time per 100 row feet transplanted per person, transplants per hour, and transplants per hour per person were calculated. For harvest activities, time per pound of vegetable harvested, time per unit of vegetable harvested per person, units of vegetable harvested per hour, and units of vegetable harvested per hour per person were calculated. For postharvest activities, time per unit of vegetable packed, time per unit of vegetable packed per person, units of vegetable packed per hour, and units of vegetable packed per hour per

person were calculated. For CSA box packing, time per box packed, time per box packed per person, boxes packed per hour, and boxes packed per hour per person were calculated.

Statistical Analysis

Data was analyzed using JMP Pro software Version 9 (SAS Institute, 2011). Variables analyzed included level of mechanization, farm size, grower presence, new employee presence, and worker-share or volunteer presence. Level of mechanization was operationalized from the variable “Method.” Usually, a binary variable was employed (e.g., hand v. machine), but for some pulses, more variation was present in the type of machine used, and so multiple categories summarized the range of machinery employed. Farm size was operationalized from the number of acres in vegetable

Table 2. Numbers of Transplanting, Harvesting, and Postharvest Observations (“Pulses”) by Crop, Characterized by Mechanization and Farm Size, on 10 Wisconsin Diversified Vegetable Farms for the 2014 and 2015 Seasons

		Broccoli	Carrots	Lettuce	Peppers	Squash
Transplanting	<i>Mechanization</i>					
	Hand	5	n/a	5	3	2
	Machine	4	n/a	5	3	4
	<i>Farm Size</i>					
	Small	3	n/a	3	2	1
	Medium	4	n/a	3	n/a	1
	Large	2	n/a	4	4	4
	<i>Total</i>	9	n/a	10	6	6
Harvesting	<i>Mechanization</i>					
	Hand	12	11	20	13	22
	Machine	1	10	n/a	n/a	2
	<i>Farm Size</i>					
	Small	n/a	6	2	3	7
	Medium	9	9	9	5	9
	Large	4	6	8	5	8
	<i>Total</i>	13	21	20	13	24
Postharvest	<i>Mechanization</i>					
	Hand	9	13	15	6	14
	Machine	0	10	n/a	5	2
	<i>Farm Size</i>					
	Small	n/a	7	1	2	7
	Medium	8	9	9	5	7
	Large	1	7	5	4	2
	<i>Total</i>	9	23	15	11	16

production on each farm. Grower presence was noted by a “yes” or “no” to indicate whether the grower was present for the timed activity. New employee presence was noted as “yes” or “no” to whether an employee was being trained on the activity and was participating in the activity for the first time. Worker-share or volunteer presence was noted as “yes” or “no” to whether a worker-share or volunteer or other nonpaid workers were participating in the activity.

This study was designed as a comparative case study with the primary goal of evaluating the feasibility of conducting time and technique assessments on vegetable farms as a method to determine labor efficiencies associated with production, harvest, and postharvest activities incorporating different approaches. With the limited data set that

was developed, we also conducted a preliminary analysis to begin to determine the impact of farm mechanization and size on labor efficiencies for different production, harvest, and postharvest activities of five representative crops. One-way ANOVAs were conducted on all 15 pulses for each of the five different variables and for two labor productivity outcomes (output/hour and output/hour/person), for a total of 10 analyses per pulse. For each variable, significant differences were identified using a 5% and 10% significance level. While the contextual data analysis discussed below focuses on variables determined to be significant at the 5% level, significant values at the 10% level are presented within the tables to identify additional factors that may be affecting farm productivity on a practical level, but may not be detected due to

Table 3. Information Collected for Each Observation in Time and Technique Studies, Characterized by Activity, 2014 and 2015

General Information				
Environmental conditions: <i>Temperature, wind, precipitation, soil conditions</i>				
Bed conditions: <i>Number of beds, bed length, plastic mulch or bare ground, soil preparation (method and date)</i>				
Was the grower (farm owner/manager) present?				
Crew description: <i>Size, experience of crew members, presence of crew leader, information on the division of labor, rotation of tasks, if new members were being trained, if the crew included worker-shares</i>				
Activity-Specific Information				
	Transplant	Harvest	Postharvest	CSA Box Packing
Description of activity	Method: hand or machine	Method: hand or machine	Method: hand or machine	
	Equipment used	Equipment used	Equipment used	Equipment used
	Bed length	Selective harvest or complete harvest	What is being done	Total number and list of crops being packed
	Soil preparation (method and date)	Weed pressure level	Packaging Used	Packaging used
	Additional time spent watering and/or setting up irrigation	Postharvest handling in the field		
	Technique description	Technique description	Technique description	Technique description
Trial specific information	Crew number	Crew number	Crew number	Crew number
	Time per bed	Time per trial	Time per trial	Time per trial
	Rows per bed	Rows per bed	Amount accomplished	Type of share (half, full)
	In-row spacing	Bed length	Units	Number of boxes packed
	Transplants per bed	Yield: in pounds and units, when feasible	Market destination	Total number of shares
	Were transplants watered?	Market destination		
	Total time	Total time	Total time	Total time

small sample sizes and high standard deviations. A 10% level was used to determine statistical significance unless otherwise noted. Tukey's HSD tests were conducted to test the significant differences between each pair of categorizations within a variable. While the test assumes equal variance, the high level of variance in each pulse was assumed to satisfy this assumption. However, this analysis is not meant to be conclusive, but to provide initial observations to as where differences in farm labor efficiencies appear to exist and where further research efforts may be focused.

Results

Implementation and Feasibility of Time and Technique Assessments

As stated in the introduction, one of the primary goals of this study was to begin the development of benchmark values that could help guide farmers regarding the adoption of innovation, including best management practices, mechanization purchases, and scaling-up decisions for their farms. To accomplish this goal, a first objective involved the assessment of appropriate methodology with which to collect the data to create benchmark values. The development of baseline values requires a community-based approach, with cooperation from a group of farms with commonalities in production approaches and markets. Other efforts to develop these types of benchmarks have focused on farm finances, with one of the more extensive being FINBIN (Center for Farm Financial Management, 2016). The FINBIN database crowdsources and summarizes actual farm data entered by farmers using the FINPACK software that was developed for farm economic analysis. With access to the data summaries, farmers can compare their own farm financial information to the benchmarks created through information contributed from peer farms. These comparisons can indicate where farms may be excelling (in this case, using the metric of farm financial ratios) or falling short of success.

Whereas farms routinely collect farm financial data for tax purposes, facilitating the ability to crowdsource data, the collection of labor inputs by crop-specific activity is much less common on diversified vegetable farms (Silva, Hendrickson,

Mitchell, & Bietila, 2017). Thus, a significant part of our efforts was focused on exploring possibility mechanisms with which to collect this data. For the purposes of this study, we used a participatory approach that involved both farmers and university employees, to assess not only the variability in the data that was collected, but also the feasibility of data collection efforts on farms by designated either on- or off-farm employees.

The 10 farms recruited to participate in the project remained in the study for both years within which data was collected. With two full-time university employees responsible for data collection and input throughout the production season, farm visits typically occurred 3 days week⁻¹, with one or two farm visits per day, depending on farm location and daily farm activities. Communication between farmers and data collectors occurred by telephone and email, typically 24–48 hours before a farm visit was scheduled. Data collectors recorded time to complete farm activities, as well as related data including crew size, amount of product planted, harvested, or packed, and other process details that may have affected the interpretation of results.

Across our case study of the 10 farms, we observed differences in crew sizes, divisions of labor, level of mechanization, and general management styles. For most activities, only one type of machine was used, resulting in a binary comparison. Transplanting machines consisted of waterwheel and carousel transplanters. Mechanized harvest equipment included digging machines (undercutters and carrot harvesters) for carrots, and mechanized harvest conveyor belts (suspended off a flatbed trailer hooked up to a tractor) for squash and broccoli. These belts allowed workers to place harvested produce onto the belt, reducing the amount of bending and the required time for crating. Postharvest washing and packing equipment included barrel washers and brush washers.

Transplanting Case Studies

For the task of transplanting, 31 discrete data pulses were collected to be included in the initial case study analysis, ranging across different approaches to mechanization (waterwheel transplanters and carousel transplanters) (Table 4).

Table 4. Transplanting Labor Productivity Means Characterized by Mechanization and Farm Size and Effects of Five Variables on Labor Productivity for 10 Certified Organic Diversified Vegetable Farms in Wisconsin for Seasons 2014 and 2015

	Broccoli		Carrots	Lettuce ^a		Peppers		Squash	
	Mean ± SD	Median	Mean ± SD	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median
Mechanization									
Hand	314 ±157	353	n/a	186 ± 97	154	113 ± 30	102	89 ± 21	89
Machine	421 ± 111	403	n/a	753 ± 356	846	438 ± 263	319	492 ± 188	570
Farm size									
Small	341 ± 37	340	n/a	232 ± 98b	936	97 ± 9	97	103	
Medium	388 ± 225	460	n/a	164 ± 87 b	254	n/a		492 ± 188	104
Large	340 ± 43	340	n/a	878 ± 256c	226	366 ± 260	287	89	
<----- p > f ----->									
Farm size	ns		n/a	0.0021		ns		n/a	ns
Mechanization	ns		n/a	0.0088		0.1010		0.0460	ns
Grower presence	ns		n/a	ns		ns		ns	ns
New employee?	ns		n/a	0.0197		ns		ns	ns
Worker shares/ Volunteers?	ns		n/a	0.0492		ns		ns	ns

ns Not significant at the 0.10 probability level

^a Lettuce harvest measured in heads harvested per hour per person

Numbers in columns followed by different letters were significantly different at $p < 0.10$ according to an analysis of variance; means were compared through the Tukey-Kramer procedure.

Nonmechanized hand-scale tools used included Hatfield transplanters, rolling dibblers, and hand dibblers. Most farms used trays of soil plugs, requiring the dislodging of each seedling from the trays, resulting in increased time to complete the pulse. This task was usually done prior to the primary task of transplanting, often utilizing the whole crew. A few farms used soil blocks, requiring less labor during the transplanting activities, but noted to be labor-intensive to prepare at the initial seeding. Some farmers incorporated fertilizer application as part of transplanting activities, either in the waterwheel transplanter ($n=4$) or by hand ($n=5$) into dibbled holes created for the transplants. Crew sizes ranged across crops and were generally greater for the mechanized processes.

Across all crops, labor productivity for transplanting by nonmechanized labor ranged from 61 to 485 transplants per hour person, with an average value of 176. Average crew size for hand transplanting activities was 3.3 people. Comparing non-mechanized labor productivity averages across all crops, broccoli transplanting was completed with a

higher rate of labor productivity (314 transplants hr^{-1} person $^{-1}$), while squash transplanting was completed at a lower labor productivity rate (89 transplants hr^{-1} person $^{-1}$).

Labor productivity for mechanized transplants ranged from 212 to 1108 transplants hr^{-1} person $^{-1}$, with an average value of 526. Average crew size for mechanized transplanting activities was 4.6 people. When comparing mechanized averages across all crops, labor productivity was highest for lettuce transplanting (753 transplants hr^{-1} person $^{-1}$), while broccoli transplanting demonstrated the lowest labor productivity (421 transplants hr^{-1} person $^{-1}$). The carousel transplanter was more efficient than most waterwheel transplanters observed on a per-hour or per-unit area basis, although it was not statistically significant. In the majority of observations, the task of mechanical transplanting required an additional crew member to replant any plants not fully placed into the soil.

Farm size affected the labor productivity of transplanting activities. For lettuce, peppers, and squash, larger farms demonstrated higher labor

productivity (878 transplants hr⁻¹ person⁻¹) than small and medium-sized farms (232 and 164 transplants hr⁻¹ person⁻¹, respectively). Large farms observed for these crops used mechanized transplanters, while small and medium farms used mostly hand-scale tools. For broccoli, labor productivity for transplanting did not vary across farm sizes.

Of all the variables analyzed, mechanization had the greatest relationship labor productivity for transplanting activities, with significant differences observed in the completion of transplanting tasks for lettuce ($p=0.0088$) and squash ($p=0.0460$) on a transplants hr⁻¹ person⁻¹ basis. Labor productivity for lettuce transplanting was significantly correlated with farm size ($p=0.0021$) and new employees being trained ($p=0.0197$), with lower numbers of transplants per hour observed on medium-sized farms and those with new trainees present.

Harvest Case Studies

In our initial case studies, labor productivity for carrot harvest was influenced by mechanization, although not significantly at the $\alpha=0.05$ level

($p=0.0519$) (Table 5). On a per-person average, harvests using a tractor-driven carrot harvester (654 lbs⁻¹ hr⁻¹ person⁻¹) were more efficient than harvests using either the undercutter (122 lbs⁻¹ hr⁻¹ person⁻¹) or hand tools (e.g., digging forks or shovels) (91 lbs⁻¹ hr⁻¹ person⁻¹). However, while mechanized carrot harvesters did increase labor productivity, they also required larger labor crews, with an average crew size of seven. Labor productivity using the undercutter ranged from 26 to 341 lbs⁻¹ hr⁻¹ person⁻¹, with an average of 122 and a crew size of five. Labor productivity using mechanized carrot harvesters ranged from 449 to 1,279 lbs hr⁻¹ person⁻¹, with a mean of 816 lbs hr⁻¹ person⁻¹; the labor required for harvesting carrots differed from farm to farm in terms of division of labor. Farms with distinct divisions of labor (e.g., one person digs and another pulls) generally had higher labor productivity than farms with all crew members performing overlapping tasks.

We observed the use of harvest belts for broccoli and squash at one farm, with their use resulting in variable labor productivity as calculated by overall pounds harvested per hour, and not

Table 5. Harvest Labor Productivity Means Characterized by Mechanization and Farm Size and Effects of Five Variables on Labor Productivity for 10 Certified Organic Diversified Vegetable Farms in Wisconsin for Seasons 2014 and 2015

	Broccoli		Carrots		Lettuce ^a		Peppers		Squash	
	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD	Median
Mechanization										
Hand	162 \pm 162	156	91 \pm 65	90	171 \pm 102	156	75		86 \pm 65	63
Machine	121		400 \pm 439	246	n/a		n/a		105 \pm 18	105
Farm size										
Small			112 \pm 75 b	130	229 \pm 107 bc	229	78 \pm 33 bc		69 \pm 41	51
Medium	179 \pm 46	151	93 \pm 100 b	56	114 \pm 48 c	115	36 \pm 17 c		81 \pm 57	68
Large	180 \pm 88	150	581 \pm 486 b	468	219 \pm 122 b	194	112 \pm 52 b		112 \pm 82	81
<----- p > f ----->										
Farm size	n/a		0.0242		0.0640		0.0297		ns	
Mechanization	ns		0.0010		n/a		n/a		ns	
Grower presence	ns		ns		ns		ns		ns	
New employee?	ns		ns		ns		ns		ns	
Worker shares/ Volunteers?	ns		ns		ns		ns		ns	

ns Not significant at the 0.10 probability level

^a Lettuce harvest measured in heads harvested per hour per person

Numbers in columns followed by different letters were significantly different at $p<0.10$ according to an analysis of variance; means were compared through the Tukey-Kramer procedure.

significantly different from harvests without the use of this tool (broccoli: 121 lbs⁻¹ hr¹ person⁻¹ with the harvest belt and 162 lbs⁻¹ hr¹ person⁻¹ without; squash: 105 lbs⁻¹ hr¹ person⁻¹ with the harvest belt and 86 lbs⁻¹ hr¹ person⁻¹ without).

Farm size was correlated with increased labor productivity at harvest for carrots, lettuce, and peppers, but not for broccoli or squash (Table 5). Overall, large farms had higher labor productivity than small and medium-sized farms, but this was not always significant for every crop measured. For carrot harvests, large farms had significantly higher labor productivity than small and medium farms ($p=0.0242$). For lettuce harvests, large farm harvests had significantly higher labor productivity than medium farm harvests at $\alpha=0.10$, but not $\alpha=0.05$ ($p=0.0640$). For pepper harvests, large farms had significantly higher labor productivity than medium farms ($p=0.0297$). Grower presence, new employee presence, and worker share presence had no significant impacts on harvest activities across all crops. Overall, harvest activities varied less by mechanization intensity and more by

strategies concerning division of labor and process management.

Postharvest Case Studies

Time and technique case studies for postharvest activities were limited to the observation of washing and packing, and tasks within those activities (Table 6). Productivity of brush washer use was measured for peppers and squash, and barrel washer use for carrots. Washing and packing of broccoli and lettuce mostly involved dunk tanks or evaporative pre-cooling. Aside from the brush washing, squash postharvest washing and packing was often minimal.

Across all crops, labor productivity for hand labor postharvest activities ranged from 18 to 58 lbs washed and packed hr¹ person⁻¹ (Table 6). Crew size averaged two people for all processes, whether performed by hand or machine. Labor productivity for mechanized postharvest tasks, using either a brush washer or barrel washer, ranged from 81 to 1,350 lbs washed and packed hr¹ person⁻¹. For activities involving brush washers, labor

Table 6. Postharvest (Washing and Packing) Labor Productivity Means Characterized by Mechanization and Farm Size and Effects of Five Variables on Labor Productivity for 10 Certified Organic Diversified Vegetable Farms in Wisconsin for Seasons 2014 and 2015

	Broccoli		Carrots		Lettuce ^a		Peppers		Squash		CSA ^b	
	←———— Pounds washed and packed per hour per person —————→											
	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median
Mechanization												
Hand	212 ± 127	164	158 ± 124	158	n/a		198 ± 170	136	187 ± 130	155	30 ± 11	30
Machine	n/a		387 ± 280	304			439 ± 532	150	278 ± 202	277	n/a	
Farm size												
Small	n/a		306 ± 115	283	99	99	296 ± 278	312	216 ± 137 ^{c d}	193	37 ± 6 ^d	36
Medium	189 ± 113	160	210 ± 276	81	65 ± 27 ^d	58	141 ± 100	110	119 ± 54 ^d	127	31 ± 13 ^{c d}	26
Large	396	396	271 ± 276	134	471 ± 199 ^c	571	520 ± 576	312	417 ± 3 ^c	418	24 ± 9 ^b	25
	←———— <i>p</i> > <i>f</i> —————→											
Farm size	n/a		ns		0.0002		ns		0.0082		0.0900	
Mechanization	n/a		0.0030		n/a		ns		ns		n/a	
Grower presence	ns		ns		ns		ns		ns		ns	
New employee?	ns		0.0830		0.0152		ns		ns		ns	
Worker shares/ Volunteers?	ns		0.0325		ns		ns		ns		0.0924	

ns Not significant at the 0.10 probability level

^a Lettuce postharvest measured in heads packed per hour per person

^b CSA box packing measured in boxes packed per hour per person

Numbers in columns followed by different letters were significantly different at $p < 0.10$ according to an analysis of variance; means were compared through the Tukey-Kramer procedure.

productivity ranged from 108 to 1,350 lbs washed and packed hr⁻¹ person⁻¹, with a mean of 439 lbs washed and packed hr⁻¹ person⁻¹ for peppers and 277 lbs washed and packed hr⁻¹ person⁻¹ for squash. With barrel washers for carrots, labor productivity for postharvest activities ranged from 81 to 883 lbs washed and packed hr⁻¹ person⁻¹, with an average of 387.

Several variables affected the productivity of postharvest activities. Integration of mechanized techniques into carrot, pepper, and squash postharvest activities trended toward higher labor productivity as compared to hand-washing and packing (387, 439, and 278 vs. 158, 198, and 187 lbs washed and packed hr⁻¹ person⁻¹, respectively), although only this trend was only significant for carrot ($p=0.0002$). Barrel washing of carrots (387 lbs washed and packed hr⁻¹ person⁻¹) and brush washing of peppers (439 lbs washed and packed hr⁻¹ person⁻¹) and squash (277 lbs washed and packed hr⁻¹ person⁻¹) had higher labor productivity for washing and packing activities, although not statistically significant in the case of brush washing.

The larger farms in our study group generally demonstrated higher labor productivity for postharvest washing and packing activities, with the exception of carrots. For lettuce, larger farms demonstrated significantly higher labor productivity than medium farms ($p=0.0002$). For squash, large farms had significantly higher labor productivity than medium farms, but not small farms ($p=0.0082$). For broccoli, greater measured labor productivity for large farms was found at an overall pounds washed and packed per-hour level (793 lbs washed and packed hr⁻¹ person⁻¹), but not on a per-person level (397 lbs washed and packed hr⁻¹ person⁻¹).

Crew experience resulted in significant differences with respect to labor productivity in postharvest events for only one crop. New employee presence significantly lowered the labor productivity for lettuce postharvest activities (61 lbs washed and packed hr⁻¹ person⁻¹ if new employee present versus 327 heads washed and packed hr⁻¹ person⁻¹ if not; $p=0.0152$). Worker share presence also lowered the labor productivity for complete lettuce postharvest activities (76 heads washed and packed hr⁻¹ person⁻¹ if worker share present versus 249

heads washed and packed hr⁻¹ person⁻¹ if not), although not significantly so. Grower presence had no significant effect on labor productivity for postharvest activities for any of the crops and/or activities measured in this study.

CSA Box Pack Case Studies

Of all the observed activities, case study observations focused on packing CSA share boxes demonstrated the least amount of variation across farms. Average and median number of items packed per CSA was 11 items, with a minimum of 7 and a maximum of 14 and standard deviation of 1.6. No significant differences were observed in the number of boxes packed per hour per person between the different ranges of items packed per box that were analyzed (>10, 10–12, and 13+ items). All farms' CSA box packing was nonmechanized. Variation existed with respect to division of labor (e.g., assignment of tasks to specific individuals) and crew composition. The majority of farms assigned each person on the pack line three produce items to place in each box, with other individuals additionally assigned to prepare and close the boxes. Individuals on the pack line pushed the boxes forward on a roller table, with each person packing their assigned items into the box. A few farms, with smaller crew sizes and fewer CSA members, had one or two crew members packing the boxes, filling each box with every share item before moving on to the next box. Many farms used worker-shares to pack CSA boxes, as training requirements were minimal. The number of boxes packed hr⁻¹ person⁻¹ ranged from 9 to 52.0, and averaged 29.7 across all farms; the average crew size was six for CSA box packs.

Worker share presence and farm size affected labor productivity for CSA box packing at the $\alpha=0.10$ level, but not at the $\alpha=0.05$ level. The presence of worker shares increased labor productivity, in number of boxes packed hr⁻¹ person⁻¹ (34.3 boxes packed hr⁻¹ person⁻¹ with worker shares versus 26.2 boxes packed hr⁻¹ person⁻¹ without; $p=0.0924$). In terms of farm size, the small farms on average had higher labor productivity (36.5 boxes packed hr⁻¹ person⁻¹) than large and medium farms (23.8 and 30.6 boxes packed hr⁻¹ person⁻¹, respectively) ($p=0.0899$).

Discussion

The short-term objective of this case study of 10 diversified vegetable farms was to assess labor productivity on diversified vegetable farms using the approach of time and technique observations, with the aim of providing an initial understanding of differences in labor productivity as related to production, harvest, and packing practices, as well as farm size. Ultimately, the longer-term goal of this project was to provide benchmark values that can be used to assess the adoption of innovation related to best management practices, mechanization purchases, and scaling up decisions for farms. In the process of meeting this goal, we utilized a novel methodology that provides a framework for food systems and agricultural professionals, as well as farmers and other collaborators, to collect refined, accurate data in their own communities and on their own farms.

Our case studies demonstrate a high level of variability in labor productivity across the crops and activities observed on diversified vegetable farms, reflecting the heterogeneity of approaches to production and management, both within and across farm size classification and level of mechanization. This degree of variability was similar to that found in LeRoux et al. (2010), who concluded that accurate farm financial assessments of small-scale farms needed to be done on a per-farm basis versus using more generalized enterprise budgets in order to properly account for the vast differences in sales, labor requirements, and other associated costs. Our data also support the conclusions of Conner and Rangarajan (2009), who noted large differences in the enterprise budgets generated by land-grant university research programs versus budgets based on actual farm data from organic diversified vegetable farms, resulting from the complexity of the operations and the smaller scale of production of each individual crop.

Time and technique studies proved challenging to implement to the extent needed to collect the number of data points needed across a representative set of farms to appropriately account for the wide range of variability that was observed. While time and technique assessments present a unique approach to estimating labor productivity, they are not without limitations when employed on working

diversified vegetable farms. Due to the complexity of data collection and the on-farm, participatory approach employed by the research team, a relatively small number of data points were included in the analyses for each activity performed in each analysis category (farm size, level of mechanization). With a high degree of heterogeneity in farm production approaches, employee management, and environmental conditions, a concurrent high degree of variability in the data was observed, warranting caution when extrapolating from our limited data set more definitive influences of any one or combination of factors on farm labor productivity. As such, the data collecting through this preliminary exercise is best viewed in the context of a comparative case study, rather than an extensive survey of a larger population of diversified vegetable farms in the upper Midwestern U.S.

With respect to recommendations to other agricultural and food system professionals wanting to expand on this work, we can make several recommendations. First, to reduce heterogeneity across all possible farm variables, farms to be included in the study could be selected for increased standardization across certain variables (e.g., crew size, markets, managerial approaches, CSA box share size, etc.). Second, a more limited set of activities and crops may be necessary to achieve the larger sample size needed to account for the high degree of variability of labor inputs and approaches characteristic of diversified vegetable farms. A more limited set of activities would also mitigate the need for the degree of labor employed in the data collection efforts for this study. Ideally, with a stronger emphasis on a crowd-sourcing data approach, data collection would be conducted on-farm by a farm employee. Several farms organized under a specific umbrella group (e.g., a food hub, produce auction, or local National Farmers Union organization, among others) could identify a specific crop and related activities on which to focus data collection for a season, developing a dataset to serve as the basis for benchmark values while limiting the number of hours an employee needed to devote to data collection activities.

While our case study-based analysis is limited to five crops, the results are a starting point to

allow farmers, farm advisors, and food system planners to evaluate labor productivity and production costs on farms. However, it must be stressed that, due to the intensity of labor required to conduct this initial trial of time and technique data collection (i.e., two full-time seasonal university employees over the course of two production seasons), the number of observations for each activity and each crop was limited. The ability to make conclusive observations is further confounded in our comparative case study, as we observed high variability in labor productivity across farms despite the deliberate selection of activities that were anticipated to provide relative uniformity across farms. In part, this high degree of variability in productivity emerged due to different approaches for using tools designed to increase productivity (e.g., a barrel washer used in carrot postharvest activities), including the associated division of labor related to the tool varying widely. Additionally, other activities important to managing and contributing to the labor needs for diversified vegetable farms were not included in our case studies, such as weed management; these activities were deliberately omitted from our efforts as they are strongly affected by both management and environmental factors, thus creating an even greater degree of variability across farms. As such, the creation of benchmark values for these activities becomes even more challenging.

In our limited data set, farm size was correlated with increased labor productivity across several crops and activities; transplanting for lettuce; harvesting for carrots, lettuce, peppers; postharvest for lettuce and squash; and CSA box-packing were all influenced by farm size. Harvest activities are most markedly correlated with farm size, with increases in labor productivity for large farms up to threefold for peppers, lettuce, and squash. Similar gains in labor efficiencies with increasing farm size have been found with other sectors of agriculture in Wisconsin (Bewley, Palmer, & Jackson-Smith, 2001). Higher labor productivity for carrot harvest on large farms is partially explained by the presence of machine carrot harvesters. Overall, larger farms were generally more systematized in their managerial approaches to their labor pools for harvesting, which could account for a portion of the higher

labor productivity observed on larger farms. Labor productivity observed for postharvest washing and packing on large farms may be more related to economies of scale; processes creating greater efficiencies may be limited to larger volumes of produce.

In our study, this pattern of lower labor productivity on midsized farms was most pronounced in harvest activities, for all crops except squash. Some of this is attributable to one of the medium farms' focus on education and recruitment of a large pool of "interns." Other speculations on the source of this decrease in productivity suggest that medium farms are scaling up from an operation primarily run and staffed by the farmer(s) themselves, to an operation where a multiperson crew is necessary. This shift requires management skills, which take time to attain, and a change in processes to accommodate a crew. The impact of this shift to larger scales of production, and the associated challenge of gaining the appropriate managerial skills, has been noted in other agricultural sectors (Bitsch, Harsh, & Muger, 2003). Through focus group discussion, Bitsch et al. found that with increasing farm size, labor becomes an increasingly critical resource; however, with new responsibilities as human resource managers, farmers must also require new skills, which takes time and training. Also noteworthy is the dearth of federal programs and resources for farmers who are no longer considered "beginning farmers" (by the USDA definition), but still need to build skills and receive continuing education as the needs of their operations evolve.

This work also highlights several important aspects of technology and innovation adoption on the production costs for diversified vegetable farms, which could affect the success of farmers to scale up to meet the product demands of our local and regional food systems. Our case studies demonstrate the potential impacts of both bulky and divisible innovations on the productivity of diversified vegetable farms. As described in a report by the National Research Council (2002), bulky innovations can be described most often by those technological advances and innovations that include farm machinery, such as tractors and harvesting equipment, and which require a significant

up-front initial investment cost. Conversely, divisible innovations, can be divided into smaller units, theoretically, allowing their adoption to be more scale-neutral. Examples of divisible innovations include the use of new crop varieties and pest management inputs, as well as managerial innovations such as new techniques for weeding or the modification of timing of activities (National Research Council, 2002).

In terms of appropriate technology adoption, certain innovations may be biased toward certain farm scales and management approaches. Bulky innovations tend to be biased toward larger farms with more up-front resources to invest in equipment purchases. Among the variables examined in our case studies, the adoption of bulky innovations (e.g., mechanization) were associated with gains in productivity and productivity of several crops and activities. The adoption of divisible innovations, despite the lack of need for capital funds, may still require a large initial investment, the nature of which potentially biases them toward certain farms (Feder & O'Mara, 1981). Examples of initial investments for divisible innovations include training of employees, which can be a resource drain for small farms who often have managers taking on multiple farm roles. Additionally, as observed in the implementation of our labor resource-intensive time and technique measurements, the on-farm evaluation of new labor, practice, and equipment innovations is a time-consuming endeavor, again potentially placing smaller farms at a disadvantage.

While both bulky and diffusive innovations can provide benefits to the productivity and profitability of farms of all scales, in order to account for the potential economic disadvantages of innovation adoption that can be biased toward small farms, it is crucial to ground Extension and outreach efforts focused on innovation within the context of appropriate technology adoption. It is recognized that technical change, including that arising from agricultural research and development, is a key driver of both profitability and productivity (Mugera, Langemeier, & Ojede, 2016). However, in tandem with research efforts to enhance the productivity and profitability of vegetable farms, Extension and outreach efforts must be conducted to facilitate the adoption of both new and existing technologies, to

ensure that beneficial advances occur on-farm (Schimmelpfennig, O'Donnell, & Norton, 2006).

While this initial comparative case study does not include an adequate number of data points to provide conclusive explanations, it does begin to elucidate the appropriateness of both bulky and divisible innovations across various scales of diversified vegetable farms, due to observations indicating higher labor productivity on large farms as compared to small and medium farms. Although our observations are preliminary and qualitative, it appears that these gains in labor productivity are a combination of bulky innovation (e.g., greater use of mechanized equipment) and divisible innovation (e.g., how labor crews are using the equipment). As medium-sized farms begin to invest in mechanization to achieve the efficiencies of the larger farms in our study group, overall economic advantages may not be realized, as the gains in greater labor productivity may not offset the high cost of equipment; thus efforts to incorporate more mechanization may be unprofitable, depending on the specific techniques with which the equipment is used.

While the relationships between farm scale and mechanization are correlative and are not absolute across all crops and activities, they cannot predict labor productivity. Yet they point to what sets some farms apart with respect to productivity, and indicate crops or activities that can benefit from adoption of machinery or are more suitable for scaling up production. Information such as that presented in this paper, gained from time and technique studies, could help farmers make more strategic decisions—with regard to both machinery purchases and crop specialization—that could better position them to supply greater volumes of produce to wholesale distributors or food hubs serving local and regional markets, while still remaining price-competitive and profitable. Lack of knowledge and information about the costs and benefits of adopting new technologies or conservation practices significantly affect a farmer's propensity to utilize these technologies (Bowman & Zilberman, 2013), thus highlighting the importance of quantifying technological advantages to incentivize farmers.

Other considerations such as crew size, farm land base, and worker welfare are also important

elements in assessing the advantages of each mechanized process. In our study, mechanization resulted in significantly higher labor productivity for all transplanting activities, carrot harvest, and postharvest activities. Transplanting by hand is very labor-intensive across all crops, and mechanized transplanting has the potential to increase labor productivity up to tenfold. Crew size remains a critical consideration, however, as mechanized transplanters require an average of four to five crew members. As a result, farms with fewer crew members may not be able to support the use of mechanized equipment, such as a waterwheel or carousel transplanter. Logistical concerns about space and turning radii must also be factored into decisions about mechanization. Activities for which the mechanized process did not show significantly higher labor productivity as compared to the nonmechanized process were usually attributable to a major difference in crew size or inexperience with equipment.

Worker welfare emerged as a factor entering into mechanization decisions as well. This balance between cost-benefits and welfare considerations is illustrated by the example of harvest belts. With the use of this mechanized equipment, the average crew size needed for harvest was relatively large, with 8.3 people designated to a specific harvest task, which decreased the labor productivity (calculated per person) and crew available to complete other tasks. But some additional equipment, such as harvest belts, can incorporate ergonomic and worker welfare benefits, adding to the advantages of these machines. Other types of equipment offered benefits with respect to both ergonomics and productivity; for example, barrel washers greatly increased labor productivity without requiring an increase in crew size. Many farmers praised the benefits of a barrel washer, rather than washing vegetables by hand, a time-consuming and uncomfortable task. As such, within this study, barrel washers emerged as one of the mechanized tools more flexible regarding farm scale.

The data collected in this study also speak to the capital/labor dynamic central to economic analysis, illustrating deviation from a simple fixed ratio where more capital translates to less labor needed to complete a task (Shapiro, 1986). Tractor-

pulled transplanters and carrot harvesters are effective, but their crew size requirements render them less widely adaptable on diversified vegetable farms. With crew sizes smaller than five, the barrel washer for carrots is the only scale-appropriate machine that had significant effects on labor productivity observed in this study. The dichotomy in the factors driving mechanization decisions on the small and medium-sized farms underlines for the need for scale-appropriate, inexpensive machinery.

Despite limitations, the study does achieve its initial objective of preliminarily assessing labor productivity on diversified vegetable farms using the novel approach of time and technique studies, allowing for an initial evaluation of the impact of farm size, level of mechanization, and employee management on labor efficiencies, and ultimately, farm profitability. With this data as guidance, future research and extension directions for food system and agricultural professionals can better be determined.

Conclusions

Despite this comparative case study's limitations and small sample size, it illustrates the potential value of time and technique studies to assess labor productivity and cost of production on diversified vegetable farms. More extensive studies, with the inclusion of a greater number of farms, could broaden this set of case studies and provide additional data to further decipher the interactions of labor management, mechanization, and labor productivity, particularly as related to scaling up to serve regional food systems. Time and technique studies could also contribute to collective resources and tools for regional sustainable agriculture organizations and professionals involved in supporting local and regional food systems. One possible resource includes the compilation of results and insights from case studies that growers could use to better evaluate the impact or pay-back time of investing in a tool such as a transplanter or root washer. Through the completion of this project, we aimed to provide farmers and collaborating food systems development specialists with data and tools to assess farm economic status, contributing to the body of work to assist farmers in balancing

various constraints, such as crop diversification, labor inputs, and marketing channels (Navarrete et al., 2015). Further, this information can inform strategies and policies to aid small and midscale diversified farmers in the scaling-up of regional food systems, such as mechanization adoption. While some of the information outlined in this paper can be directly integrated into farmer decision-making—such as altering crew management, increasing or decreasing production areas depending on the labor inputs required for crops, or rethinking postharvest and pack shed configurations—other aspects can direct efforts of Extension educators, food system development professionals, nonprofit organizations, and food hub managers.

It is critical to recognize that, with any promotion of technology, the technological change must be scale- and cost-appropriate for a farm's financial, labor, and physical resources. A change in mechanization often requires a financial investment for farmer; thus, the farmer must achieve greater production or increased value of the product in order to increase profits and justify the cost of the technology (Food and Agriculture Organization of the United Nations [FAO], 2007). Further, as described by Just and Zilberman (1988), if small farms cannot adopt a new technology that is readily available to their larger counterparts, the small farms can suffer further economically if the new technology leads to industrywide reductions in prices.

While midscale farms may lack immediate access to capital for the purchase of bulky innovations, policies and business models that promote cooperative ownership or lease agreements could have benefits for farmers scaling up to a midsize production model. For example, equipment lending and leasing programs could be organized by Extension agents, cooperatives, and state agencies or nonprofits. While short-term leasing and contracting of equipment is common in row crop and grain production, the practice remains relatively uncommon in vegetable cropping systems. Alternatively, while not a new concept, farmers

with moderate equipment needs and smaller acreage might develop agreements to share equipment, in arrangements that could include farms in close and more distant geographic proximity (Artz, Colson, & Ginder, 2010; Ginder, Artz, & Colson, 2004). This strategy can also benefit postharvest operations, through coordination of shared packing and storage facilities when crop production portfolios are complementary. In areas with a high density of small and midsize vegetable farms, equipment sharing may take the alternative form of a custom operator, offering an alternative income stream for some farmers. While larger farms tend to be early adopters with respect to bulky innovations (Feder, Just, & Zilberman, 1985; Marra & Carlson, 1990), this bias might be reduced if cooperative equipment sharing models were expanded.

Additionally, policies could support research and business endeavors that develop tools for midscale vegetable farms and incentive programs to make these tools more affordable. Such programs could include low-interest loan programs, such as the programs administered by the USDA Farm Service Agency to assist small and midscale vegetable producers build postharvest storage capacity (USDA, 2016a) and finance their agricultural operations (USDA, 2016b). With promotion of both technical and policy support, farmers, policy-makers, program activists, and food systems professionals can strengthen synergies between production approaches, labor management, and market decisions, thereby improving the performance of farms serving local and regional food systems.



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References

- Ali, M., & Lucier, G. (2008). *Production expenses of specialized vegetable and melon farms* (Report No. VGS-328-01). Washington, D.C.: U.S. Department of Agriculture.
- Artz, G., Colson, G., & Ginder, R. (2010). *A return of the threshing ring? A case study of machinery and labor-sharing in midwestern farms*. *Journal of Agricultural and Applied Economics*, 42(4), 805–819. <https://dx.doi.org/10.1017/S1074070800003977>
- Berkey, R. E. (2014). Just farming: An environmental justice perspective on the capacity of grassroots organizations to support the rights of organic farmers and laborers. *Dissertations & Theses*, 141. Retrieved from <http://aura.antioch.edu/etds/141>
- Bewley, J., Palmer, R. W., & Jackson-Smith, D. B. (2001). An overview of experiences of Wisconsin dairy farmers who modernized their operations. *Journal of Dairy Science*, 84(3), 717-729. [https://dx.doi.org/10.3168/jds.S0022-0302\(01\)74526-2](https://dx.doi.org/10.3168/jds.S0022-0302(01)74526-2)
- Bitsch, V., Harsh, S. B., & Muger, A. (2003). *Risk in human resource management and implications for extension programming: Results of focus group discussions with dairy and green industry managers*. Retrieved from <http://ageconsearch.umn.edu/bitstream/22085/1/sp03bi02.pdf>
- Bowman, M. S., & Zilberman, D. (2013). Economic factors affecting diversified farming systems. *Ecology and Society*, 18(1), 33. <https://dx.doi.org/10.5751/ES-05574-180133>
- Bozoğlu, M., & Ceyhan, V. (2007). Measuring the technical efficiency and exploring the inefficiency determinants of vegetable farms in Samsun province, Turkey. *Agricultural Systems*, 94(3), 649-656. <http://dx.doi.org/10.1016/j.agsy.2007.01.007>
- Buck, D., Getz, C., & Guthman, J. (1997). From farm to table: The organic vegetable commodity chain of Northern California. *Sociologia Ruralis*, 37, 3-20. <http://dx.doi.org/10.1111/1467-9523.00033>
- Calvin, L., & Martin, P. (2010). *The U.S. produce industry and labor: Facing the future in a global economy* [ERS Report Summary]. Retrieved from the U.S. Department of Agriculture, Economic Research Service website: https://www.ers.usda.gov/webdocs/publications/44764/8068_err106_reportsummary.pdf?v=41056
- Center for Farm Financial Management. (2016). About FINBIN. Retrieved from <https://finbin.umn.edu/Home/AboutFinbin>
- Chase, C. (2012). *Selected alternative agricultural financial benchmarks* (File C3-65). Retrieved from <https://www.extension.iastate.edu/agdm/wholefarm/html/c3-65.html>
- Conner, D., & Rangarajan, A. (2009). Production costs of organic vegetable farms: Two case studies from Pennsylvania. *HortTechnology*, 19(1), 193-199. Retrieved from <http://horttech.ashspublishings.org/content/19/1/193.full>
- Daniels, P. (2017). Designing a renewable food system. *Stanford Social Innovation Review*. Retrieved from https://ssir.org/articles/entry/designing_a_renewable_food_system
- Escalante, C. L., & Santos, F. I. M. (2010). Differentiation in farm labor complement profiles of organic and conventional farms in the southeast: Coping with a changing farm labor market. *Agricultural and Applied Economics Association*. Retrieved from <http://purl.umn.edu/61359>
- Food and Agriculture Organization of the United Nations [FAO]. (2007). Addressing the challenges facing agricultural mechanization input supply and farm product processing. *Agricultural and food engineering technical report 5*. Retrieved from <ftp://ftp.fao.org/docrep/fao/010/a1249e/a1249e.pdf>
- Feder, G., & O'Mara, G. T. (1981). Farm size and the adoption of Green Revolution technology. *Economic Development and Cultural Change*, 30(1), 59-76. <https://dx.doi.org/10.1086/452539>
- Feder, G., Just, R. E., & Zilberman, D. (1985). Adoption of agricultural innovations in developing countries: A survey. *Economic Development and Cultural Change*, 33(2), 255-298. <https://dx.doi.org/10.1086/451461>
- Galt, R. E., Christensen, L., Bradley, K., Simpson, N., Munden-Dixon, K. (2015, Sept. 28). Community Supported Agriculture (CSA) in California: Findings from the CSA farmer/operator survey [Powerpoint slides]. Presentation at CSA Workshop, Sebastopol Grange, Sebastopol. Retrieved from <http://www.caff.org/wp-content/uploads/2015/10/Galt-2015-CSA-farmers-presentation.pdf>

- Ginder, R., Artz, G., & Colson, G. (2004). *Alternative approaches for sharing machinery, labor and other resources among small- and medium-sized producers* [Working paper]. Ames: Department of Economics, Iowa State University.
- Hardesty, S. (2007). *Producer returns in alternative marketing channels* [PowerPoint presentation]. Davis: University of California–Davis Small Farms Program, Department of Agriculture and Resource Economics. Retrieved from <http://www.sfc.ucdavis.edu/events/07hardesty.pdf>
- Hendrickson, J. (2005). *Grower to grower: Creating a livelihood on a fresh market vegetable farm*. Retrieved from Center for Integrated Agricultural System website: <https://www.cias.wisc.edu/report-helps-fresh-market-vegetable-growers-understand-and-share-finances/>
- Jacobsen, K. L., Escalante, C. L., & Jordan, C. F. (2010). Economic analysis of experimental organic agricultural systems on a highly eroded soil of the Georgia Piedmont, USA. *Renewable Agriculture and Food Systems*, 25(4), 296-308. <http://dx.doi.org/10.1017/s1742170510000323>
- Just, R. E., & Zilberman, D. (1988). The effects of agricultural development policies on income distribution and technological change in agriculture. *Journal of Development Economics*, 28(2), 193-216. [https://dx.doi.org/10.1016/0304-3878\(88\)90058-2](https://dx.doi.org/10.1016/0304-3878(88)90058-2)
- LeRoux, M. N., Schmit, T. M., Roth, M., & Streeter, D. H. (2010). Evaluating marketing channel options for small-scale fruit and vegetable producers. *Renewable Agriculture and Food Systems*, 25(1), 16-23. <http://dx.doi.org/10.1017/s1742170509990275>
- Lohr, L., & Park, T. A. (2009). Labor pains: Valuing seasonal versus year-round labor on organic farms. *Journal of Agricultural and Resource Economics*, 34(2), 316-331. Retrieved from <http://www.jstor.org/stable/41548416>
- Low, S. A., Adalja, A., Beaulieu, E., Key, N., Martinez, S., Melton, A.,...Jablonski, B. B. R. (2015). *Trends in US local and regional food systems: A report to Congress*. Retrieved from the Economic Research Service, United States Department of Agriculture website: <https://www.ers.usda.gov/publications/pub-details/?pubid=42807>
- Marra, M. C., & Carlson, G. A. (1990). The decision to double crop: An application of expected utility theory using Stein's theorem. *American Journal of Agricultural Economics*, 72(2), 337-345. <https://dx.doi.org/10.2307/1242337>
- Mugera, A. W., Langemeier, M. R., & Ojede, A. (2016). Contributions of productivity and relative price changes to farm-level profitability change. *American Journal of Agricultural Economics*, 98(4), 1210-1229. <https://dx.doi.org/10.1093/ajae/aaw029>
- National Research Council. (2002). Structural implications of technology transfer and adoption. *Publicly funded agricultural research and the changing structure of U.S. agriculture* (pp. 52-68). Washington, DC: The National Academies Press. <http://dx.doi.org/10.17226/10211>
- Navarrete, M., Dupré, L., & Lamine, C. (2015). Crop management, labour organization, and marketing: Three key issues for improving sustainability in organic vegetable farming, *International Journal of Agricultural Sustainability*, 13(3), 257-274. <http://dx.doi.org/10.1080/14735903.2014.959341>
- Oberholtzer, L. (2004). *Community supported agriculture in the Mid-Atlantic region: Results of a shareholder survey and farmer interviews*. Small Farm Success Project, Stevensville, Maryland.
- Ostrom, M. (2007). The contribution of community supported agriculture (CSA) to movements for change in the agri-food system. In C. Hinrichs & T. Lyson (Eds.), *Remaking the North American food system* (pp. 99-120). Lincoln, Nebraska: University of Nebraska Press.
- Pates, N. J., & Artz, G. M. (2014). Potential for machinery: A case study of fruit and vegetable growers in Iowa. *Leopold Center Pubs and Papers* (Paper 20). Retrieved from http://lib.dr.iastate.edu/leopold_pubs/papers/20/
- Revkin, A. C. (2014, December 4). On smaller farms, including organic farms, technology and tradition meet. *The New York Times*. Retrieved from <https://dotearth.blogs.nytimes.com/>
- SAS Institute. (2011). JMP Pro [Version 9]. Cary, North Carolina: SAS Institute.
- Schimmelpfennig, D. E., O'Donnell, C. J., & Norton, G. W. (2006). Efficiency effects of agricultural economics research in the United States. *Agricultural Economics*, 34(3), 273-280. <https://dx.doi.org/10.1111/j.1574-0864.2006.00124.x>
- Schreck, A., Getz, C., & Feenstra, G. (2006). Social sustainability, farm labor, and organic agriculture: Findings from an exploratory analysis. *Agricultural and Human Values*, 23(4), 439-449. <https://dx.doi.org/10.1007/s10460-006-9016-2>

- Shapiro, M. D. (1986). The dynamic demand for capital and labor. *The Quarterly Journal of Economics*, 10(3), 513-542.
<http://dx.doi.org/10.2307/1885695>
- Silva, E. M., Claypool, R., Munsch, J., Hendrickson, J., Mitchell, P., & Mills, J. (2014). Veggie Compass: A spreadsheet-based tool to calculate cost-of-production for diversified organic vegetable farmers. *HortTechnology* 24(3), 394-402.
 Retrieved from <http://horttech.ashspublications.org/content/24/3/394.full>
- Silva, E. M., Hendrickson, J., Mitchell, P. D., & Bietila, E. (2017). From the field: A participatory approach to assess labor inputs on organic diversified vegetable farms in the Upper Midwestern USA. *Renewable Agriculture and Food Systems*. Advance online publication. <http://dx.doi.org/10.1017/S1742170517000266>
- Tegtmeier, E., & Duffy, M. (2005). *Community Supported Agriculture (CSA) in the midwest United States: A regional characterization*. Ames, Iowa: Leopold Center for Sustainable Agriculture, Iowa State University.
- U.S. Department of Agriculture. (2012). *U.S. Census of agriculture*. Retrieved from <http://www.agcensus.usda.gov/>
- U.S. Department of Agriculture, Farm Service Agency [USDA FSA]. (2016a). *Farm Storage Facility Loan program*. Retrieved from <http://www.fsa.usda.gov/programs-and-services/price-support/facility-loans/farm-storage/>
- USDA FSA. (2016b). *USDA announces streamlined guaranteed loans and additional lender category for small-scale operators*. Retrieved from http://www.fsa.usda.gov/news-room/news-releases/2016/nr_20161020_rel_227
- U.S. Department of Labor. (2016). *Conducting work measurements of jobs that will be paid a piece rate under FLSA Section 14(c)*. Retrieved from <https://webapps.dol.gov/claws/whd/flsa/14c/18c4.htm>

Farmers who don't farm: The curious rise of the zero-sales farmer

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Abstract

While researchers have extensively studied the growth in the number of small farms between 1982 and 2012 reported in the Census of Agriculture (COA), there has been little discussion of trends among farm operators who do not sell any agricultural products. Using previously unreleased COA data collected between 1982 and 2012, this research empirically examines these “zero-sales farmers” for the first time. There was a large increase in the number of zero-sales farmers from 104,000 in 1982 to 466,000 in 2012, as well as a remarkable rise in their share of the farming population, from 5 percent in 1982 to 22 percent in 2012. Women and minority farmers were disproportionately likely to be zero-sales operators: at least 30 percent of women, Native American, and black farmers reported no sales in 2012. Older and beginning farmers were also more likely to report zero sales in 2012 than younger and experienced

ones, respectively. Zero-sales farmers dramatically influenced recent census data on farm income, farm size, and operator age, among other results, due to their substantial share of the overall population. In order to effectively utilize COA data, practitioners, policymakers, and researchers should include zero-sales farms in their analyses. There are several steps the U.S. Department of Agriculture (USDA) can take to make information about zero-sales farmers more readily available and widely understood, such as introducing a zero-sales category in the census results.

Keywords

Agriculture; Census; Census of Agriculture; Farmers; Women Farmers; Beginning Farmers; Black Farmers; African American Farmers; Small Farms; Hobby Farms; Zero Sales

Introduction

The verb “farm” has long been associated with commercial activity. When the word first appeared in writing in the 15th and 16th centuries, it meant to acquire the rights to something temporarily—often

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but not exclusively land—for a fixed payment or, inversely, to assign one's property rights to another temporarily in exchange for a fixed payment, a meaning which has survived in the contemporary phrase “to farm out” (*Oxford English Dictionary Online*, 2017). Thus, when Richard II says that he is “enforc'd to farm our royal realm” to raise revenue in Shakespeare's *King Richard the Second* (Shakespeare, 1623/2012, 1.4.45), he means that he must rent or lease out the land, not that he must use it for agricultural production (*Oxford English Living Dictionaries Online*, n. d.). It was not until the early 19th century that the word began to be used in recorded speech to refer to the cultivation of one's own land (*OELD Online*, n. d.).

Today, the Oxford American College Dictionary defines the verb “farm” as to “make one's living by growing crops or keeping livestock” (*OELD Online*, n.d.). While there is widespread awareness that many farmers today cannot or do not make a living from farming, it is still generally regarded as an act conducted for income. The Census of Agriculture (COA) appears to adopt this view, defining “farm” as “any place from which [US]\$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year” (USDA, National Agricultural Statistics Service [USDA NASS], 2014a, Appendix A, 1). In recent years, however, after significant changes in COA methodology and implementation, the census has reported rapid increases in the number of zero-sales farms—farms that do not sell any agricultural products.

Conducted every five years, the COA is the most comprehensive government survey of any industry in the country. It is used by policymakers, advocacy organizations, academics, and others to understand economic and demographic characteristics of the country's farms, and to develop, implement, and evaluate programs and policies. Despite its prominence, a number of researchers have argued that COA counts of minority, women, and small-scale farmers are inaccurate. An analysis of Georgia tax digests, which provide a more complete account of land ownership than the COA, estimated that the 1920 census undercounted black-owned farmland in Georgia by about 27 percent and the 1959 census by about 49 percent

(Fisher, 1978). Spot checks made in North Carolina and Mississippi after the 1969 COA suggested that the census may have undercounted black-owned farmland by as much as 30 percent (Salamon, 1976). A study of black farmers in a Mississippi Delta county concluded that while the 1997 COA was more accurate than previous censuses, it nonetheless excluded 27 percent of the black farmers surveyed in the study because they sold less than US\$1,000 in agricultural products and thus did not meet the COA definition of farmer (Wood & Gilbert, 2000). While most studies of undercounting are of black farmers, researchers have also found that women and other minority farmers have been undercounted. Until 2007, the COA counted all farms within each Native American reservation as a single farm, which led to severe undercounts (Bartecchi, 2009; USDA NASS, 2009).¹ Women operators are disproportionately more likely to operate small-scale farms (Sachs, Barbercheck, Braiser, Kiernan, & Terman, 2016), which has contributed to their being undercounted in the COA.

The COA has become more accurate in recent years, but this has masked real trends in the number of farms. When the USDA statistical division, the National Agricultural Statistics Service (NASS), replaced the Census Bureau as the administrator of the COA in 1997, the survey became more accurate (Gilbert, Sharp, & Felin, 2002). Gilbert, Sharp, and Felin argue that this improved accuracy created a “false ‘trend,’” in which the number of black farmers appeared to stabilize or even increase, although the actual number likely decreased in the 1990s (Gilbert et al., 2002, p. 5). Changes made to COA sampling procedures in 2002 increased the number of small-scale farms (as measured by sales) reported in the census, skewing COA averages (Duffy, 2008). As discussed below, changes to the COA adjustment methodology were also implemented in 2002, and then again in 2012, further

¹ USDA conducted a pilot project during the 2002 COA to collect and publish data on individual farms and ranches on Native American reservations in Montana, North Dakota, and South Dakota (USDA NASS, 2004). Data on farms and ranches on reservations in other states were not collected, however.

increasing the number of minority, women, and small-scale farmers reported by the census. While Gilbert, Sharp, and Felin limited their discussion to black farmers, the same “false ‘trend’” appears to exist for other groups disproportionately likely to operate small-scale farms. A 2013 USDA report on women farmers compared COA data from 1982 and 2007 and found that zero-sales farms had increased fivefold—almost twice as fast as any other sales class during that period (Hoppe & Korb, 2013). The authors also found that almost 60 percent of the increase in women farmers between 1982 and 2007 was due to the growth of zero-sales farms (Hoppe & Korb, 2013).

This article builds on previous research by demonstrating the important role that zero-sales farms have played in recent COA trends. The rapid growth of zero-sales farms counted in the census has had a sizable impact on COA results, particularly on income averages, and on data on women and minority farmers. Prior to this article, however, data on zero-sales farmers were generally unavailable, making it difficult to assess the impact of those farms on census results. This article provides an in-depth evaluation of data on zero-sales farms for the first time.

Data Sources

After initially withholding the data due to confidentiality concerns, NASS provided the author with the total number of principal operators reporting zero sales for each of the seven censuses conducted between 1982 and 2012. In addition, NASS released data to the author from the 2012 COA on the following characteristics of principal operators with zero sales: race, ethnicity, and gender identity; age; and years of operator experience.²

A literature review found that the USDA has only released data on zero-sales farms twice prior to this article. A 1951 USDA Bureau of Agricultural Economics paper on operator income included the number of zero-sales farms counted in the 1945 COA and a smaller survey conducted in 1947 (Koffsky & Lear, 1951). Its results are

briefly discussed below. As mentioned above, a 2013 report by the successor to the Bureau of Agricultural Economics, the USDA Economic Research Service, also included data on the number of zero-sales farms by gender in the 1982 and 2007 censuses (Hoppe & Korb, 2013).

Results

The following section shows the total number of principal operators with zero sales for each COA between 1982 and 2012, and discusses how changes in the COA contributed to the recent rise of zero-sales operators, with an analysis of demographic characteristics of zero-sales operators in the 2012 COA across the three broad categories stated above.

Historical Trends: Between 1982 and 2012, the number of principal operators with zero sales rose considerably, as did their share of the farming population. A 1951 Bureau of Agricultural Economics paper on operator income, which included the percentage of farms reporting zero sales in 1945 and 1946, found that the share of principal operators in the COA with zero sales was much lower in the mid-20th century than it is today. In 1945, the first year for which data are available, zero-sales farmers accounted for 9 percent of all farmers (Koffsky & Lear, 1951). A follow-up sampling survey conducted by the Bureau of Agricultural Economics in January of 1947 found that 7.4 percent of farmers reported zero sales in 1946 (Koffsky & Lear, 1951). Although changes in sample size and methodology may account for some of the difference between the 1945 and 1946 results, the number of zero-sales farms reported in the 1945 COA may have also been abnormally high due to the wartime exodus of farmworkers and farmers into the military and industrial front (Carpenter, 1997).

In 1982, the next year for which data are available, zero-sales farmers made up 5 percent of all operators. Their share of the farming population changed little over the next 10 years: the 1992 COA reported 108,000 zero-sales operators, making up almost 6 percent of the total. This share rose to 9 percent in 1997, however, and by 2002, the COA included 449,000 zero-sales operators—21 percent of the total farming population. As

² The data are available from the author by request. They can also be retrieved from the NASS Data Lab by requesting special tabulations 23377 and 23378.

shown in Figure 1, the censuses in 2007 and 2012 reported similar totals. The 2012 COA reported 466,000 zero-sales operators, which accounted for 22 percent of all principal operators.

The dramatic increase in zero-sales operators is due in part to changes made to the COA's adjustment methodology beginning in 2002. In contrast to decennial census results, COA data are adjusted after the enumerative count. The USDA uses sampling surveys and other methods to establish estimates on census-eligible properties that were either not counted or miscounted, and then adjusts the data accordingly.

Prior to the 2002 COA, the USDA only adjusted data for nonresponses. The agency used databases, surveys, and, occasionally, telephone calls and in-person visits to estimate the characteristics of farm operators that failed to return census forms (USDA, NASS, 1999, Appendix C). These estimates were then used to modify collected data, increasing COA accuracy. As a result, a significant number of the farms reported in the census results never actually filled out a census form. In 1997, for example, 12 percent of the farms included in the final census report were added to adjust for nonresponses (USDA NASS, 1999, Appendix C).

The USDA added a new element to their adjustment methodology for the 2002 COA. In addition to accounting for nonresponses, the USDA began making "coverage adjustments"—adjustments intended to account for farms it had missed (USDA NASS, 2004, Appendix C).³ About 30 percent of the farms in the 2002 COA were added in the adjustment phase: 12 percent for nonresponses and 18 percent for the coverage adjustment (USDA NASS, 2004, Appendix C). Similarly, 31 percent of the farms in the 2007 COA were added in the adjustment phase (USDA NASS, 2009, Appendix A). In 2012, the USDA added a third component to the adjustment phase: misclassification. The misclassification adjustment

modifies the data for properties that were mistakenly classified as farms or nonfarms (USDA NASS, 2014a, Appendix A). As a result, the percentage of farms reported in the COA that was due to adjustments rose to 35 percent, with 16 percent of the total added to account for nonresponses, 12 percent from the coverage adjustment, and 6 percent due to misclassification (USDA NASS, 2014a, Appendix A).

As Figure 1 demonstrates, these COA changes coincided with a massive increase in the number of principal operators reporting zero sales. In 2002, when the coverage adjustment was added, the number of zero-sales operators jumped 160 percent from the previous COA in 1997. While we do not know exactly how many of the 277,000 "new" zero-sales operators reported in 2002 were added due to the coverage adjustment—and will not know, unless the USDA releases these data—we do have such data for operators with sales below US\$1,000. As a result, we can calculate how many were added due to changes in adjustment methodology. This is significant since the <US\$1,000 sales category largely comprises principal operators with zero sales: almost 80 percent of the farmers in this category were zero-sales operators in 2002.

Figure 2 shows the total number of principal operators with sales below US\$1,000 from 1982 to 2002. Then, from 2002 to 2012, it shows the number of principal operators with sales below US\$1,000 both with the coverage adjustment and without it (operators added due to the misclassification adjustment are included in the coverage adjustment category). As Figure 2 indicates, the number of principal operators in the <US\$1,000 sales category would have increased considerably regardless of whether the coverage adjustment was added. In 2002, for example, there would have been an additional 107,000 principal operators even without the coverage adjustment. Thus, while coverage adjustment explains much of the increase in farms with sales below US\$1,000—up to 64 percent of the category's growth in 2002—it was not the only factor. Other possible factors are discussed in the subsequent section.

Race, Ethnicity, and Gender: In 2012, zero-sales operators were disproportionately likely to be minority and women. Among the racial and ethnic

³ The term "coverage adjustment" can refer to adjustments for various things, such as overcoverage, undercoverage, and errors. I follow NASS's practice here of using the term to refer to adjustment for farms that were not counted in the census but should have been.

Figure 1. Number of Principal Operators with Zero Sales, 1982–2012

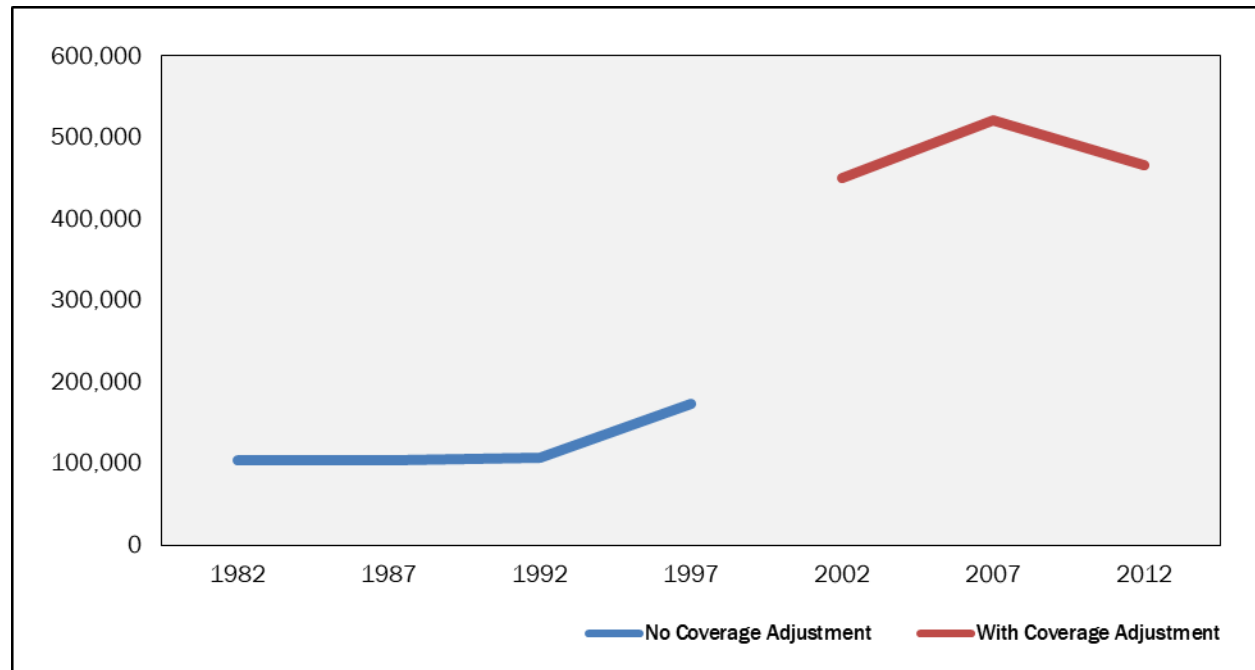
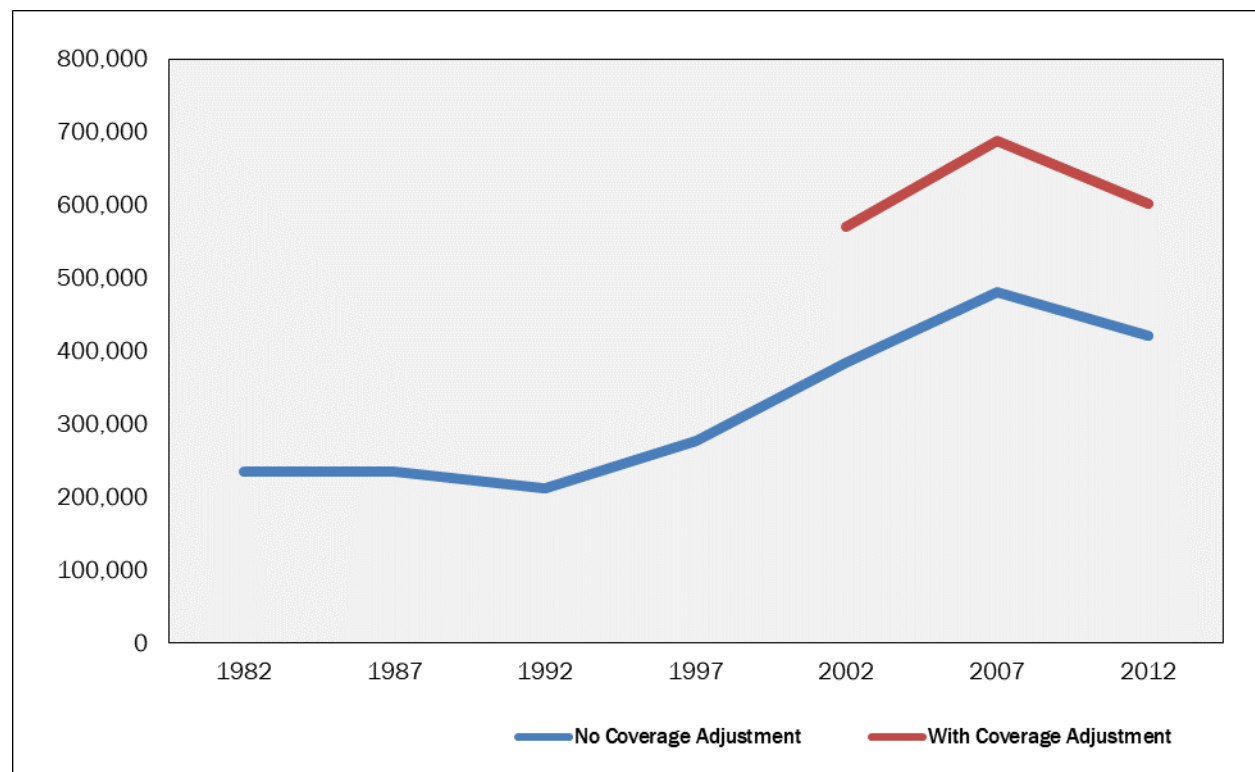


Figure 2. Number of Principal Operators with Sales Below US\$1,000, 1982–2012



groups included in the COA, Native Americans were the most likely to be zero-sales operators (32%), followed by blacks (30%), Hispanics (26%), operators reporting more than one race (23%), and whites (22%) (Table 1).⁴ A significant share of Pacific Islander (24%) and Asian (12%) principal operators were also classified as zero-sales operators; however, there were too few principal operators from each group in the COA for the results to be statistically reliable. Among all the ethnic, racial, and gender groups included in the COA, women principal operators were the most likely to report zero sales (35%), while male principal operators were the least likely (20%).

Age: The share of principal operators reporting zero sales rises dramatically with age (see Table 2). The percentage of zero-sales operators in the oldest age group (29%), for example, was more than twice the percentage of zero-sales operators in each of the two youngest age groups (13%).

Years of Experience: Beginning farmers were slightly more likely to report zero sales than principal operators with a decade or more of experience. Approximately 24 percent of principal operators with less than 10 years of experience on any farm had zero sales (Table 3). This was true

Table 1. Principal Operators with Zero Sales by Race, Ethnicity, and Gender, 2012

Race, Ethnicity, or Gender	Number of Principal Operators with Zero Sales	Percentage of Principal Operators with Zero Sales
Black	10,042	30%
Hispanic	17,230	26%
Multi-Racial	2,322	23%
Native American	12,131	32%
White	439,096	22%
Female	100,847	35%
Male	364,791	20%
Total	465,638	22%

Table 2. Principal Operators with Zero Sales by Age, 2012

Age Group	Number of Principal Operators with Zero Sales	Percentage of Principal Operators with Zero Sales
Under age 25	1,391	13%
Ages 25–34	13,968	13%
Ages 35–44	37,487	18%
Ages 45–54	94,363	20%
Ages 55–64	134,757	22%
Ages 65–74	109,001	25%
75 years and over	74,671	29%

Table 3. Principal Operators with Zero Sales by Years of Experience, 2012

Years of Experience Operating Any Farm	Number of Principal Operators with Zero Sales	Percentage of Principal Operators with Zero Sales
Under 5 years	31,415	24%
5 to 9 years	60,756	24%
10 years or more	373,467	22%

both for principal operators who began farming after the 2007 COA (those with under five years of experience) and for principal operators who began farming between the 2002 and 2007 censuses (those with five to nine years of experience). By contrast, 22 percent of farmers with 10 years or more of experience reported zero sales.

Conclusions

The dramatic growth of zero-sales farms reported in the COA has several important implications.

⁴ Although the COA asks farm operators if they are of “Spanish, Hispanic, or Latino origin,” it does not treat Hispanic or Latino as a racial category. As a result, Hispanic farmers are identified as multiracial, black, white, or any of the other four other racial categories in the COA in addition to being categorized as Hispanic. See USDA, National Agricultural Statistics Service (2014a, Appendix B).


Practitioners, researchers, and policymakers should consider the influence of zero-sales farms on any COA data before using it. Programs and policies often target farmers who participate in commercial markets, yet rely on data with zero-sales farms—which do not participate in agricultural markets—to evaluate their effectiveness. This may not have been a critical issue in 1982 when zero-sales farms accounted for only 5 percent of the total, but today, when they compose 22 percent of all farms, their inclusion has a substantial impact on important quantitative indicators, such as median farm income.

Zero-sales farms have a particularly significant impact on data regarding minority, women, and beginning farmers, since farmers in these groups are disproportionately likely to be zero-sales operators. In particular, claims that the numbers of minority, women, and beginning farmers have risen since 1997, which are commonly made by the USDA, journalists, and researchers alike (e.g., Harvey, 2016; Raftery, 2011; Sachs et al., 2016; USDA NASS, 2014b) should be re-examined in light of these new data. Further research will be needed to clarify the extent to which COA results for these groups have been affected by changes in COA methodology and implementation, as well as the rise of zero-sales farms.

The ubiquity of zero-sales farms also calls into question the widespread assumption that most small farms either compete with larger-scale farms or would do so given sufficient resources (e.g., Moyer, 2015; Smith, 2014). While undoubtedly some small farms participate in the same markets as larger-scale farms, almost 40 percent of small farms do not participate in any commercial markets for agricultural products, despite USDA data showing that, on average, small farm households have high levels of wealth (even when farm assets are excluded from the total) and low levels of debt (USDA, Economic Research Service, 2016). Further research should examine the extent to which zero-sales operators engage in agricultural production, their motivations for doing so, and their ability to access the capital necessary to operate a commercial farm.

As discussed above, changes in COA methodology likely only account for about two-thirds

(64%) of the rise in zero-sales operators since 1997. Research will be needed to identify other possible factors contributing to the rise, such as shifts in land use and changing USDA practices, including its census outreach efforts.

Finally, the USDA should consider changing its data collection and reporting practices in view of the major role that zero-sales farms play in the U.S. agricultural landscape. Among other actions, the USDA could release additional information about its system for classifying properties with zero sales as farms,⁵ include additional questions in the COA on operator goals and household finances, and introduce a zero-sales category in the census results.⁶ Farms that do not sell products nevertheless can provide their communities with significant environmental, educational, and recreational benefits, among other contributions, thus meriting their inclusion in the COA. By gathering and sharing additional information about these operations, the USDA will allow policymakers, researchers, and practitioners to better understand their distinctive needs, characteristics, and services. 

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⁵ While the USDA definition of a farm has been in place since 1975, it gives the agency significant leeway in interpreting the requirement that a place “sold or normally would have sold” at least US\$1,000 of agricultural goods to qualify as a farm. The USDA currently considers properties to meet this requirement if they demonstrate the potential to produce US\$1,000 in sales from agricultural products, even if they are not actively engaged in agricultural production (O’Donoghue, Hoppe, Banker, & Korb, 2009).

⁶ There are currently 15 different sales categories in the COA, ranging from less than US\$1,000 agricultural products sold to US\$5,000,000 or more. If adopted as a sales category, zero-sales would be the largest in the census and more than twice the size of the next largest category. See USDA, NASS (2014a, Table 2).

References

- Bartecchi, D. (2009, November 4). USDA misrepresents situation of Native American farmers. Village Earth [Blog post]. Retrieved from <https://www.villageearth.org/pages/global-affiliate-network/projects-pineridge-reservation/usda-misrepresents-situation-of-native-american-farmers>
- Carpenter, S. A. (1997). "Regular farm girl": The women's land army in World War II. *Agricultural History*, 71(2), 162–185. Retrieved from <http://www.jstor.org/stable/3744245>
- Duffy, M. (2008). Appendix: The changing status of farms and ranches of the middle. In T. A. Lyson, G. W. Stevenson, & R. Welsh (Eds.), *Food and the mid-level farm: Renewing an agriculture of the middle* (pp. 257–284). Cambridge, Massachusetts: MIT Press.
- Fisher, J. S. (1978). Rural ownership of land by blacks in Georgia: 1920 and 1960. *Review of Black Political Economy*, 9(1), 95–107. <https://doi.org/10.1007/BF02689539>
- Gilbert, J., Sharp, G., & Felin, M. S. (2002). The loss and persistence of black-owned farms and farmland: A review of the literature and its implications. *Southern Rural Sociology*, 18(2), 1–30. <http://journalofruralsocialsciences.org/pages/Articles/SRS%202002%2018/2/SRS%202002%2018%202%201-30.pdf>
- Harvey, S. A. (2016, July 15). The resurgence of black farmers. Civil Eats [Online newsgroup]. Retrieved from <http://civileats.com/2016/07/15/the-resurgence-of-black-farmers/>
- Hoppe, R. A., & Korb, P. (2013, April). *Characteristics of women farm operators and their farms* (Economic Information Bulletin No. 111). Washington, D.C.: USDA, Economic Research Service. Retrieved from <https://www.ers.usda.gov/publications/pub-details/?pubid=43750>
- Koffsky, N. M., & Lear, J. E. (1951). Size distribution of farm operators' income in 1946. In Conference on Research in Income and Wealth (Eds.), *Studies in income and wealth*, vol.13 (pp. 220–264). New York: National Bureau of Economic Research.
- Moyer, J. (2015, February 9). What nobody told me about small farming: I can't make a living. Salon [Online news and opinion group]. Retrieved from http://www.salon.com/2015/02/10/what_nobody_told_me_about_small_farming_i_cant_make_a_living/
- O'Donoghue, E. J., Hoppe, R. A., Banker, D. E., & Korb, P. (2009, March). *Exploring alternative farm definitions: Implications for agricultural statistics and program eligibility* (Economic Information Bulletin No. 49). Washington, D.C.: USDA, Economic Research Service. Retrieved from https://www.ers.usda.gov/webdocs/publications/44357/9671_eib49.pdf?v=41318
- Oxford English Living Dictionaries Online*. (n.d.). Farm. Oxford, UK & New York: Oxford University Press. Retrieved from <https://en.oxforddictionaries.com/definition/farm>
- Raftery, I. (2011, March 5). In new food culture, a young generation of farmers emerges. *The New York Times* (p. A19). Retrieved from <http://www.nytimes.com/2011/03/06/us/06farmers.html>
- Sachs, C. E., Barbercheck, M. E., Braiser, K., Kiernan, N. E., & Terman, A. R. (2016). *The rise of women farmers and sustainable agriculture*. Iowa City: University of Iowa Press.
- Salamon, L. M. (1976). *Land and minority enterprise: The crisis and the opportunity*. Washington, D.C.: Office of Minority Business Enterprise. Retrieved from <https://eric.ed.gov/?id=ED139852>
- Shakespeare, W. (2012). *King Richard II*. (G. L. Kittredge, Ed.). Newburyport, Massachusetts: Focus Publishing. (Original work pub. 1623.)
- Smith, B. (2014, August 9). Don't let your children grow up to be farmers. *The New York Times* (p. SR5). Retrieved from https://www.nytimes.com/2014/08/10/opinion/sunday/dont-let-your-children-grow-up-to-be-farmers.html?_r=0
- U.S. Department of Agriculture, Economic Research Service [USDA ERS]. (2016). *Principal farm operator household finances, by ERS farm typology* [Table]. Retrieved from <https://www.ers.usda.gov/webdocs/DataFiles/48870/table02.xls?v=42704>
- USDA, National Agricultural Statistics Service [USDA NASS]. (1999). *1997 Census of Agriculture*. Retrieved from <http://agcensus.mannlib.cornell.edu/AgCensus/censusParts.do?year=1997>
- USDA NASS. (2004). *2002 Census of Agriculture*. Retrieved from <http://agcensus.mannlib.cornell.edu/AgCensus/censusParts.do?year=2002>

- USDA NASS. (2009). *2007 Census of Agriculture*. Retrieved from <https://www.agcensus.usda.gov/Publications/2007/>
- USDA NASS. (2014a). *2012 Census of Agriculture*. Retrieved from <https://www.agcensus.usda.gov/Publications/2012/>
- USDA NASS. (2014b). *2012 Census of Agriculture reveals new trends in farming* [Press release]. Retrieved from https://www.agcensus.usda.gov/Newsroom/2014/05_02_2014.php
- Wood, S. D., & Gilbert, J. (2000). Returning African American farmers to the land: Recent trends and a policy rationale. *Review of Black Political Economy*, 27(4), 43–64. <https://doi.org/10.1007/BF02717262>

Introduction to the EFSNE project collection of papers

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Abstract

The Enhancing Food Security in the Northeast (EFSNE) project started in 2011 to explore the potential for regional food systems to improve food security in the Northeastern U.S. Building on the nationwide interest in local food systems, EFSNE researchers have been motivated by a desire to understand whether regional food

systems, which have a larger geographic scope, might have some of the perceived sustainability benefits attributed to local food while providing food accessible to all consumers. To this end, an interdisciplinary team drawn from academic institutions, federal government research organizations, and nonprofits has spent seven years trying to understand food consumption, distribution, processing, and production in the Northeast. Through studying the actual supply chains in nine locations around the Northeast region and doing extensive modeling and analysis of secondary data on food systems, we have attempted to understand the extent to which the region can rely on its own food production and can meet the needs of low-income

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populations. This issue of JAFSCD presents an initial set of three papers that summarize key insights gathered so far. These papers explore (1) the food system as viewed through an eight-product market basket, (2) our experience engaging and informing stakeholders, and (3) consumers' perceptions of regional food. Papers to be published in a later issue are likely to cover (4) our educational activities and their impact on students and trainees, (5) the distribution of products in the Northeast food system, and (6) the capacity of the region to produce food.

Keywords

Interdisciplinary; Multidisciplinary; Regional Food System; Transdisciplinary

Purpose of the Collected Papers

Systems of all types can be difficult to define, let alone to understand. As the adage about the blind men and the elephant explains, when one only touches a part of a system, one fails to grasp the whole. Likewise, study within disciplines offers deep insights on a single part or dimension of a system, but may fail to place that knowledge in a larger perspective. Multidisciplinary, interdisciplinary, and, most recently, transdisciplinary research have been promoted as strategies for studying systems or solving complex problems that involve cutting across domains.

Without parsing too finely what distinguishes each of these terms, noting a couple of key characteristics is instructive. "Multidisciplinary," "interdisciplinary," and "transdisciplinary" research all involve people from more than one, and often many, disciplines working together on a common project and usually connote different degrees of collaboration (Kajikawa, 2008).

Conducting such research, however, is no easy task. Brandt et al. (2013), for example, identify five challenges to performing transdisciplinary research: (1) coherently framing a problem, issue, or question; (2) integrating methods across disciplines; (3) organizing the research process; (4) meaningfully engaging practitioners; and (5) generating broad, rather than just local, impact. Given such challenges, it is essential to communicate what is learned through large, cross-disciplinary projects,

both in terms of the knowledge gained and the process followed.

As members of a large, integrated project with research, education, and outreach elements, we have a unique opportunity to present what an interdisciplinary (or perhaps transdisciplinary) approach can contribute. The Enhancing Food Security in the Northeast (EFSNE) project commenced in 2011 to explore the potential for regional food systems to improve food security in the Northeastern U.S. The audience for our work spans a wide range of individuals, from academics and policymakers to low-income community members. The purpose of this set of papers is to share insights from our experience studying and communicating about regional food systems and food security.

The Enhancing Food Security in the Northeast (EFSNE) Project

The EFSNE project was conceived in 2010 as a proposal to the U.S. Department of Agriculture (USDA) Agriculture and Food Research Initiative's challenge area on global food security. Twenty investigators from 11 institutions (land grants, private universities, USDA agencies, and non-profits), led by a core group at Penn State University, put forward the idea for a five-year project to assess whether greater reliance on regionally produced foods can improve food security for low-income communities, while also benefiting farmers, food supply-chain firms, and others in the food system. USDA awarded funding to the project in 2011, initiating what has become a seven-year collaboration to study regional food security and food systems in the Northeastern U.S.¹

Two different, but complementary, definitions of food security orient the EFSNE work. Food security describes the extent to which states, regions, or nations are self-reliant in food production, and it also refers to conditions in which all residents, including those living in poverty, obtain a

¹ The Northeastern region comprises Connecticut (CT), Delaware (DE), the District of Columbia (DC), Maine (ME), Maryland (MD), Massachusetts (MA), New Hampshire (NH), New Jersey (NJ), New York (NY), Pennsylvania (PA), Rhode Island (RI), Vermont (VT), and West Virginia (WV).

safe and adequate diet. Both definitions are important across time and should be addressed simultaneously. The EFSNE project has focused on a regional scale because it is an appropriate one for addressing rural development, public health, agricultural strategies, and other important issues. Nested within it are local efforts, while the larger scale offers a more ecological focus on population density, environmental conditions, and marketing infrastructure. Our work has been motivated by an interest in agricultural sustainability, a broad concept that encompasses environmental, economic, and quality-of-life concerns, in addition to food, feed, and fiber production (National Research Council, 2010). However, food security has been the focus of the project.

We have taken an interdisciplinary, systems approach to understanding food security. Recognizing that food security issues require insights from multiple disciplines and knowledge-sharing between researchers and community practitioners, we used multiple quantitative and qualitative methods in the project: interviews, surveys, focus groups, secondary data analysis, and modeling, and others. We have attempted to study entire food systems through analysis of primary data collected in communities, stores, and the supply chains that serve them, and of secondary data on the food system available from public and private sources. Primary data were gathered from nine locations across the region, including five urban areas (Baltimore, MD; Charleston, WV; New York, NY; Pittsburgh, PA; Onondaga County, NY; and Syracuse, NY) and three rural areas (Essex County, VT; Madison County, NY; and Southern Delaware [DE]). Secondary data from a wide range of sources were gathered on the region as a whole.

The team includes more than 20 researchers from 12 academic disciplines and has involved dozens of undergraduates, graduate students, postdocs, and community liaisons who played key roles in the project. To make the project tractable, we relied on a robust organizational structure that distributed leadership responsibility through three research teams focused on consumption, distribution, and production; three teams to manage the project's activities in outreach, education, and evaluation; and a seventh team to enhance com-

munication among the modelers. Most members of the project served on multiple teams, creating a well-integrated environment that encouraged collaboration and required communication across disciplines. Indeed, the project evolved to become increasingly transdisciplinary as it progressed.

Synopses of the Papers in this Issue

The papers here explore both how we worked and what we learned, themes that will be addressed further in other planned publications from the project, including papers to be published in a future issue of JAFSCD.

In the first paper, Clancy et al. (2017) synthesize lessons learned about the Northeast food system through the market basket of foods examined in the EFSNE project. Analyses of the eight market basket items serve as a window into food access, availability, and affordability and into regional production, processing, and distribution.

In the second paper, a commentary, Ruhf et al. (2017) present the strategy used to engage and inform stakeholders. Within the EFSNE project, outreach has been viewed as a two-way street between researchers and stakeholders. The paper describes the deliberate approach that was taken to reach a range of audiences through a variety of in-person activities and communication resources.


In the third paper, Palmer et al. (2017) explore how consumers understand the concept of regional food based on focus groups conducted in four locations across the Northeast. Analysis of participant discussions yields insights on how consumers define and value regional food, relative to the more familiar concept of local food.

Conclusions

The EFSNE project's objectives were to provide evidence, analyses, and knowledge of the accessibility of regionally produced foods in the Northeast and recommendations on what might be changed—and with what possible consequences—going into the future. We believe we have accomplished these objectives in many ways. We hope readers will be inspired to consider their own definitions of “regional” and to take away a sense of the capacity of the Northeast region's farms and food infrastructure to meet regional food needs.

In addition, we think these papers offer a glimpse of how transdisciplinary inquiry can influence education and the relationship between researchers and stakeholders in integrated research. The EFSNE project started as an interdisciplinary endeavor and became more transdisciplinary as the work progressed; the team was surprised by both

unexpected successes and underestimated challenges. We expect that readers will come to their own conclusions about the value of large, interdisciplinary and transdisciplinary research projects, and hope that, on balance, the stories from the EFSNE project leave the reader with a sense of cautious optimism.



References

- Brandt, P., Ernst, A., Gralla, F., Luederitz, C., Lang, D. J., Newig, J., Reinert, F., Abson, D. J., & von Wehrden, H. (2013). A review of transdisciplinary research in sustainability science. *Ecological Economics*, 92, 1–15. <http://doi.org/10.1016/j.ecolecon.2013.04.008>
- Clancy, K., Bonanno, A., Canning, P., Cleary, R., Conrad, Z., Fleisher, D., Gomez, M., Griffin, T., Lee, R., Kane, D., Palmer, A., Park, K., Peters, C., & Tichenor, N. (2017). Using a market basket to explore regional food systems. *Journal of Agriculture, Food Systems, and Community Development*, 7(4), 163–178. <http://dx.doi.org/10.5304/jafscd.2017.074.018>
- Kajikawa, Y. (2008). Research core and framework of sustainability science. *Sustainability Science*, 3(2), 215–239. <http://dx.doi.org/10.1007/s11625-008-0053-1>
- National Research Council. (2010). *Toward Sustainable Agricultural Systems in the 21st Century*. Washington, D.C.: The National Academies Press. <https://doi.org/10.17226/12832>
- Palmer, A., Santo, R., Berlin, L., Bonanno, A., Clancy, K., Giesecke, C., Hinrichs, C. C., Lee, R., McNab, P., & Rucker, S. (2017). Between global and local: Exploring regional food systems from the perspectives of four communities in the U.S. Northeast. *Journal of Agriculture, Food Systems, and Community Development*, 7(4), 187–205. <http://dx.doi.org/10.5304/jafscd.2017.074.017>
- Ruhf, K. Z., Devlin, K., Clancy, K., Berlin, L., & Palmer, A. (2017). Engaging multiple audiences: Challenges and strategies in complex food systems projects. *Journal of Agriculture, Food Systems, and Community Development*, 7(4), 179–185. <http://dx.doi.org/10.5304/jafscd.2017.074.016>

Using a market basket to explore regional food systems

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Abstract

The market basket chosen for the Enhancing Food Security in the Northeast (EFSNE) project was one of its major tools, as its contents served as the subject of a variety of analyses across the research teams. The interdisciplinary systems project studied multiple components of food systems in the

Northeast region. One of the team members' first collaborative exercises was the choice of the eight items representing the major food groups, including different processed forms of food and healthier versions of several. This article summarizes the information gathered on the market basket items,

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including (1) some salient data describing the state of each food item's industry; (2) the current regional-self-reliance production level; (3) consumer purchases of these items in the Northeast utilizing secondary data sources and data gathered in project intercept surveys; (4) store inventories, including prices and where the food is produced or manufactured; (5) the percentage of the market basket food that is produced regionally, as well as the regional economic value-added percentage; (6) models of six of the foods predicting the effect on production and supply chains of changes in the system, such as increased demand and environmental changes; and (7) foodprints for each food. Market baskets are frequently used instruments in food environment and cost studies. Using market baskets in EFSNE allowed the teams to aggregate and interconnect data from multiple analyses done by researchers from multiple disciplines to tell a rich story about a specific set of foods, their supply chains, and the future opportunities to enhance their production and distribution in the region.

Keywords

Regional Food Systems; Regional Self-Reliance; Food Security; Market Basket; Supply Chains; Marketing and Distribution Systems; Economic Impact; Consumer Purchasing Behavior; Optimization Models; Adaptation to Climate Change

Introduction

The EFSNE project was supported by a grant from the U.S. Department of Agriculture (USDA) 2010 Agricultural and Food Research Initiative (AFRI) Global Food Security program area. The priority at the time was the development of projects on local and regional food systems that would increase food security in disadvantaged U.S. communities and create viable local/regional economies. The grants in this new program would be larger and longer in duration to encourage greater collaboration among institutions and organizations, to undertake both basic and applied research, and to engage the communities in the projects' work. To that end, projects were required, among other things, to include a multistate, multi-institutional, and transdisciplinary team composed of public and private for-profit and nonprofit sectors, and to be

focused on urban and/or rural self-defined geographic regions centered on regional food systems that included low-income communities. Projects would be integrated in that they contained research, education, and extension components.

The introduction (Peters, Clancy, Hinrichs, & Goetz, 2017) provides an overview of the EFSNE project in general, which is a unique interdisciplinary, multi-institutional, complex systems project addressing many different components of food security in the Northeast, and more specifically, the socioeconomic and biophysical constraints to regional food system expansion. The program's long-term goal is to assess whether greater reliance on regionally produced food can improve food access for low-income communities as well as benefit farmers, actors in the food supply chain, and others in the food system. Our primary objective is to increase our understanding of the mechanisms necessary to more broadly enhance food security via mainstream markets in a region, with special emphasis on low-income communities as requested by the USDA AFRI initiative.

The market basket that we chose was one of the center points of the project, as its contents served as the subject of multiple analyses across the research teams. The most important reason we developed the basket was to have a collaboration vehicle to organize the work of the teams around the same foods. We wanted to build a rich description of a select number of foods to deepen our knowledge of some of the variables that compose supply chains and production capacity. Over time, we also wanted to keep the different teams apprised of each other's work on the same foods. It would have been disjointed and frustrating to have teams or individual researchers studying different foods—and would have made it impossible to prepare all of the systems and cross-project papers that are some of the most important outputs of the project. The market basket was an important tool, but only one of several that were necessary to define the project as we envisioned. This paper reports on the components of the project that dealt with the individual foods in the market basket and is the only place where those pieces are organized to tell a cohesive story. The majority of the findings from the project across all the

teams is found in research already published or in preparation, many of which are in this article's reference list. This paper is a review of how the food items were chosen, how the research teams applied their analyses to each food, and the joint results of the research findings for each market basket food.

Market baskets are frequently used instruments in food environment and cost studies, and are defined as "a list of foods [often many items long] that represent an adequate total diet, which may include both the healthy and unhealthy foods frequently consumed by the population" (McKinnon, Reedy, Morrisette, Lytle, & Yaroch, 2009, p. S125). In EFSNE the basket assumed a larger role and a smaller size.

Several of the project's objectives were served by utilizing a market basket: we wanted to know (1) what regional production looks like at the present time and the capacity for producing more of these particular foods in the future; (2) which regionally produced foods are now found in stores in low-income areas; (3) what the supply chains look like for these foods to identify where the leverage points might be along the chain to increase the amounts going into supermarkets in low-income areas; and (4) who the purchasers are and what the purchasing patterns of these foods are in the stores we studied.

Methods

For findings from seven separate research analyses presented here there was a suite of methods utilized from across a variety of disciplines, including nutrition, soil science, rural sociology, agricultural economics, community development, and others. The first section of this article describes the market basket selection. The second section briefly describes the methods used in the analyses. For ease of reporting and comprehension, the methods and the results of the models developed across the project are presented at the end of the results section.

Market Basket Selection

One of the first collaborative exercises of the research teams was choosing the basket's eight items (Table 1). We considered a number of criteria as we selected the items:

- Whether the Northeast region was a major producer of the food: Fresh apples, cabbage, potatoes, and fluid milk met this criterion. Fresh potatoes offered an interesting debate among the nutritionists and others; some argued against their inclusion because the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was in the process of removing them from their list of approved foods. Not all the team's nutritionists agreed, and in the end the decision was made to include them because the only vegetable under consideration for the climate change scenarios being conducted by several of the researchers was potatoes (see models, p. 174). We chose ground beef because it is the number-one selling form of beef, and although beef production is not a major part of Northeast agriculture, dairy is, and a significant portion of ground beef comes from the dairy sector.
- As a complement to the previous criterion, we also wanted to determine which of the foods were more likely to be produced in the Northeast or outside the region.
- Whether the food was a staple component of most diets in the low-income areas in which we worked: All except one food, bread, met this criterion. We discussed several possible grain products, including rice and tortillas, but our optimal choice was bread (whole grain and white) because it is purchased and consumed by a large percentage of the population (Agriculture and Agri-Food Canada, 2012). Although

Table 1. EFSNE Market Basket Items

• Apples	• Bread
• Cabbage	○ white
• Potatoes	○ whole wheat
• Frozen broccoli	• Milk
○ in sauce	○ whole
○ without sauce	○ low-fat
• Canned peaches	• Ground beef
○ in syrup	○ regular
○ in juice	○ lean

bread wheat is produced in small amounts in the Northeast, a good deal of the bread in retail markets is manufactured in the region. Furthermore, the whole-grain bread approved for WIC users is labeled as such on the shelves of stores, making it easy to identify.

- Whether the food existed in recommended or less recommended forms (healthier and less healthy): Along with the three fresh vegetables, this is the case for all of the foods.
- How many food items could reasonably be studied by the teams: We chose eight foods.
- Because we were looking at multiple crop and animal products in the Northeast, we wanted the basket to contain foods from all the basic food groups in order to gain knowledge about where the Northeast food system stands with regard to at least one member of each group.
- A mix of fresh and processed foods, including frozen and canned, as processing is the optimal way to maintain markets and provide regional products year-round.

We included frozen broccoli not because any of the frozen broccoli sold in the U.S. is produced in the country, but because broccoli for freezing and fresh use was produced in many states in the Northeast in past decades, and a project studying the feasibility of returning broccoli production to the Eastern seaboard was underway (Atallah, Gómez, & Björkman, 2014).

Finally, because there were four vegetable products in the basket we wanted to have at least two fruits. We looked at data on fruit production in the Northeast and chose peaches, which are produced in several states in the region. Nationally, canned peaches are consumed in higher amounts than are fresh peaches (USDA Economic Research Service [USDA-ERS], 2016a).

Research Methods

The data presented here on specific market basket items were gathered by researchers from different disciplines serving on three different teams (production, distribution, and consumption), and at

different times over the period of 2011 to 2015. Each team included researchers from a mix of disciplines. Figure 1 is a summary of methods utilized by the teams.

Members of the Production team (PROD) used multiple data sets to produce measures of regional self-reliance (RSR) from 2001 to 2009. RSR is the net balance between production of a given commodity and the regional availability of the food or food group (Griffin, Conrad, Peters, Ridberg, & Tyler, 2014). Agricultural land use was estimated using USDA, National Agricultural Statistics Service (USDA-NASS) surveys, the NASS agricultural censuses, and individual state departments of agriculture annual and specialty crop reports (Griffin et al., 2014). Land area and production data were available for 130 foods. The USDA-ERS Food Availability Data System was used as a proxy for estimates of food consumption at the regional level. A total of 89 foods were utilized in the RSR calculation, because consumption data were not available for 41 foods and thus they were excluded from the analysis.

Another team member calculated the annual, per-capita cropland footprint of six of the foods, using the same structure as the U.S. Foodprint model (Peters, Picardy, Darrouzet-Nardi, Wilkins, Griffin, & Fick, 2016). Through three sets of calculations, the model estimates the agricultural land area required per capita to grow the foods in a complete diet and, correspondingly, the carrying capacity of the land base of the conterminous U.S. The first calculation estimated the annual, per capita food needs of the population; the second estimated the individual land area required for each agricultural commodity in the diet; and the third estimated the potential carrying capacity of U.S. agricultural land. In the Northeast model, changes were made to input parameters on crop yields, land availability, and livestock feed requirements to reflect conditions in the region. The original biophysical simulation model estimated land use requirements for complete diets, but the data reported here are for the individual market basket foods.

The Distribution team (DIST) conducted case studies of 11 stores in our low-income locations between 2011 and 2015. The locations are

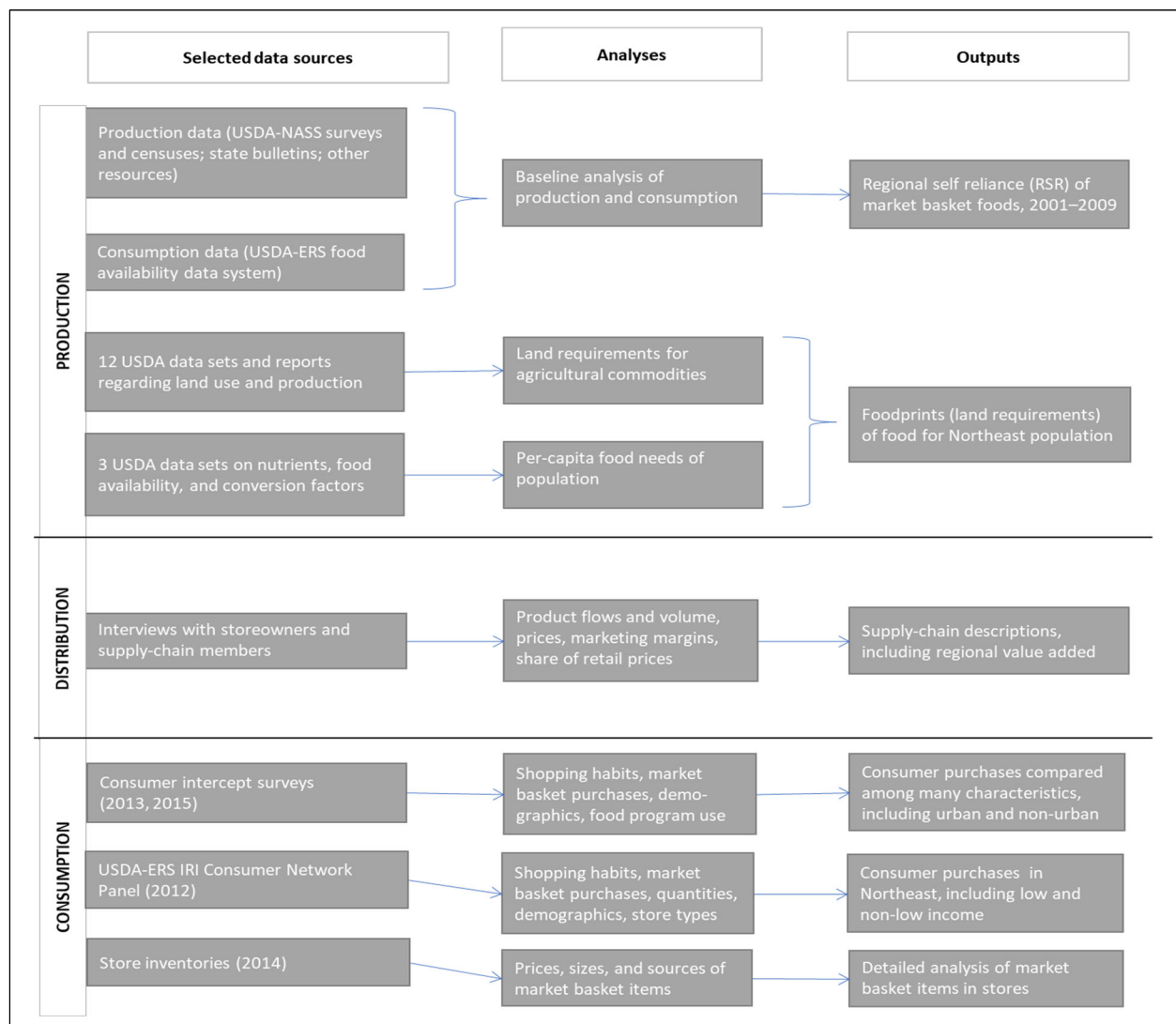
Baltimore, MD; Charleston, WV; East Harlem, NY; Essex County, VT; Kent County, DE; Madison County, NY; Onondaga County, NY; Pittsburgh, PA; and Syracuse, NY. Each case included a supply-chain analysis of two of the market basket foods, focusing on product flow and volume, prices, marketing margins, and share of retail price among supply chain members (Park, Gómez, & Clancy, 2017). An industry profile for each food was prepared to accompany the supply-chain analyses utilizing 18 USDA and industry data sources. All of the sources are cited in the text and in the reference list.

Members of the Consumption (CONS) team

analyzed data from two waves of intercept surveys conducted with 1,997 shoppers exiting EFSNE-participating stores between 2013 and 2015. The data collected included information on shopping habits, the respondents' purchases of market-basket items in the previous month, demographic characteristics, and respondents' participation in national nutrition programs such as the Supplemental Nutrition Assistance Program (SNAP) or the Women, Infants, and Children program (WIC). For the intercept surveys, the results refer to tests of difference in means (with different variances across subsamples).

At the same time as the intercept surveys,

Figure 1. Overview of Data Sources and Methods Used



CONS conducted store inventories three times over the course of the project to gather data on food prices, amounts, and sources of different versions of the market basket items. Due to space limitations all the data reported here are from the third inventory, conducted in 2014.

Team members also analyzed secondary household purchase data from the IRI Consumer Network Panel™, courtesy of the USDA-ERS. The data come from a sample of households who record all their product purchases by means of in-

home scanner devices. Roughly 120,000 households annually participate in the data collection program. Of these, about 50% show enough purchases to be included in the static panel of households, which is used for analyses (Muth et al., 2016). The researchers scrutinized multiple elements related to the purchase of market basket items at the national ($n=62,503$) and Northeast regional level ($n=12,770$) by low-income (at or below 200% of the poverty level)/non-low-income, and urban/rural status

Table 2. Overview of Regional Production, Distribution, and Availability of Market Basket Items

Market basket item	Regional self-reliance (RSR)	Foodprint (cropland acres)	Unit	Type	Proportion of stores stocking the specific food sourced from regional distributors
Apples	81%	1.59×10^{-3}	3 lb. bag	Red delicious	43%
				Golden delicious	38%
				McIntosh	80%
Cabbage	105%	0.25×10^{-3}	1 lb.		not available
Potatoes	38%	1.62×10^{-3}	5 lb. bag	Red potatoes	17%
				White round	64%
				Russet potatoes	20%
Broccoli (frozen)	1%	0.64×10^{-3}	1 package	Without sauce (name brand)	0%
				Without sauce (generic)	0%
				With sauce (name brand)	0%
				With sauce (generic)	0%
Peaches (canned)	26% (both fresh and processed)	1.03×10^{-3}	Can	In juice (name brand)	33%
				In juice (generic)	
				In syrup (name brand)	
				In syrup (generic)	
Bread	8% (for all food grains)	not able to calculate	1 loaf	White bread 1	70%
				White bread 2	70%
				Wheat bread 1	70%
				Wheat bread 2	70%
Dairy	76% (fluid milk equivalent)	16.39×10^{-3} (includes culled cattle)	1 gallon	Whole milk	71%
				2% milk	71%
				1% milk	73%
Beef	16% (all beef)	not able to calculate	1 lb. ground	75%/25% lean/fat	0%*
				80%/20% lean/fat	
				85%/15% lean/fat	

*There was a small amount of regional beef in one of the stores.
Note: 1 lb.=0.45 kg; 1 gallon= 3.79 liters

using the USDA 2013 Rural-Urban Continuum Codes (Cleary, Bonanno, & Cho, 2017). They calculated the percentage of consumers who purchased six of the eight market basket items over one year (2012), as well as average expenditures and average quantities purchased per household member and the purchases across different types of stores. For the results, they performed tests for the difference in means accounting for sample weights.

Results

In this section, we first offer profiles of the market basket foods, incorporating findings from seven analyses. Each begins with a quick overview of salient industry facts and continues with results of the PROD, DIST, and CONS research. We report on specific market basket foods found in two different stores throughout the results section. The second part of the results section presents the methods and results from the modeling exercises.

Table 3. Supply Chain Analysis of Market Basket Items

Market basket item	Store	% in stores produced in region	Regional economic value added after production	Retail price allocation						
				Farmer/producer	Processor/packer	Transportation	Produce wholesaler	Grocery wholesaler	Other	Retailer
Apples	Store 1	78%	42%	48%*		1%	4%		2% (broker)	44%
	Store 2	77%	68%	33%*		11%	10%			44%
		36%	44%							
Cabbage	Store 1	Supply chain origin Northeast		20%		2%	5%	6%		67%
		Supply chain origin Florida		18%		8%	1%	6%		67%
		2%	40%							
	Store 2	One of the store's six supply chains		32%~		8%	19%			41%
Potatoes		64%	55%							
	Store 1	Northeast supplier		37%*		2%	30%			31%
		Western shipper		45%^		22%	1%		1% (broker)	31%
	Store 2	20%	44%	26%**		7%	8%			47%
Broccoli (frozen)		0%	67%							
	Store 1	Supply chain origin Guatemala		24%**	22%	11%	13%			31%
	Store 2	0%	41%	44%	4%	15%				37%
Peaches (canned)	Store 1	0%	50%	10%	40%		22%			28%
	Store 2	0%	33%	13%	55%		6%			26%
Bread	Store 1	0%	Unknown						68% (manufacturer)	32%^
	Store 1	100%	100%	45%	41%					14%
Milk		100%	100%							
	Store 2	Supply chain one		54%	42%					4%
		Supply chain two		56%	38%					4%
Beef (ground)	Store 1	0%	29%		47%	4%		13%		36%
	Store 2	0%	38%		39%	3%		17%		41%

* grower shipper; ^ only shipper; ~ producer-packer-shipper; ** grower processor; ^^ wholesaler/retailer

Individual Food Profiles

Apples. Data from USDA show that in 2015 the Northeast region produced about 12% of the country's fresh apples and 35% of the processing crop measured by net value (USDA NASS, 2017). New York (2nd) and Pennsylvania (4th) are two of the top five apple-producing states, at 1,350 million pounds (612 million kilograms) and 515 million pounds (233 million kg), respectively (USDA NASS, 2016e). Table 2 presents the RSRs and foodprints for each item.

In the store inventories, we recorded the sources of production and distribution if that information was available; we could not discern the production source of apples. Table 2 does show the proportion of the apples sourced from regional distributors. The proportion was calculated from information received from the store inventories and storeowner interviews. Table 3 contains information about the supply-chain analyses for each food and store. For apples the regional supply chain provides 78% of the stores' supply. It also shows the retail price allocation across one each of

the regional (store one) and national (store two) supply chains.

Table 4 presents selected findings from the analysis of data gathered from intercept surveys.

Cabbage. Although cabbage consumption is declining (USDA ERS, 2015), it is still the fourth-highest value vegetable crop grown in the Northeast region (USDA NASS, 2017). New York and California rotate from year to year as the country's leading producers, with the former producing 20% of the U.S. crop in 2015 (USDA NASS, 2016b). The supply-chain analyses showed that 36% and 2% of the cabbage sold in stores one and two, respectively, were grown in the Northeast; the latter store is in Pittsburgh, on the far west end of the region. Other interesting data about cabbage are shown in Tables 2, 4, and 5.

Potatoes. Data produced by USDA show that in 2015 the Northeast region produced about 6% of the country's fresh and processed potato crops as measured by value and by weight (USDA NASS, 2016f, 2017). The largest producer in the region is Maine, with 64% of the crop, followed by New

Table 4. Intercept Survey Respondents' Characteristics with Respect to Purchasing Market Basket Items

Market basket item	Type	Purchased last month	Female		Average number of children under 5		Average years of education		Program participation		Of all purchasers	
		Yes	Purchasers	Non-purchasers	Purchasers	Non-purchasers	Purchasers	Non-purchasers	Purchasers	Non-purchasers	Rural	Non-Rural
Apples		52%	68%	64%	0.42	0.30*	13.2	13.2	45%	42%	53%	52%
Cabbage		42%	69%	63%*	0.38	0.35	12.9	13.5*	49%	40%*	37%	44%
Potatoes		67%	67%	64%	0.4	0.29*	13	13.7*	47%	37%*	65%	68%
Frozen broccoli		43%	70%	63%*	0.42	0.31*	12.8	13.6*	49%	39%*	42%	43%
Canned peaches		25%	67%	66%	0.47	0.33*	12.2	13.6*	55%	40%*	24%	25%
Bread	White	41%	66%	67%	0.43	0.32*	12.5	13.7*	54%	36%*	40%	41%
	Wheat	45%	69%	64%	0.38	0.35	13.4	13.1*	43%	44%	49%	43%
Milk	Whole	29%	63%	67%	0.44	0.33*	12.6	13.5*	55%	39%*	25%	30%
	Fat free, 1%, or 2%	44%	67%	65%	0.41	0.32	13.3	13.2	44%	43%	50%	43%
Ground beef	Regular (fat >15%)	25%	63%	67%	0.41	0.35	12.4	13.5*	56%	39%*	15%	28%*
	Lean (fat ≤15%)	26%	70%	65%	0.44	0.34	12.9	13.4*	50%	41%*	28%	26%

* Statistically different at the 1% significance level

York and then five other states (USDA NASS, 2016f, 2017). We could not determine the production locations of the three varieties of potatoes we inventoried, but distributors are identified on the labels so we can report the proportion of stores stocking the product from the region in Table 2. In Table 3 there are examples of the retail price allocations across various supply chains for several of the round white potato suppliers from different areas of the U.S. The substantial differences in transportation costs and wholesale shares are evident in the calculations.

Cleary et al. (2017), using the IRI data, calculated the percentage of consumers who purchased potatoes over one year (2012), the price per pound, and the percentage purchased in supercenters versus grocery stores (Table 5). Interestingly, non-urban households were less likely to make their purchases in grocery stores; they utilize superstores more frequently for all their food shopping (Cleary et al., 2017).

Frozen broccoli. While approximately 80% of the fresh broccoli supply in the U.S. in 2015 was

produced domestically, 92% of the frozen broccoli consumed (farm weight) was imported, accounting for 30% of all frozen vegetable imports (USDA ERS, 2015). The imports come primarily from Mexico, Guatemala, and Ecuador (USDA ERS, 2017). Frozen broccoli consumption in the U.S. is a bit less than half of fresh consumption. The per-capita availability of frozen broccoli in 2014 was 2.6 pounds (1.2 kg) farm weight, 1.9 pounds (0.9 kg) trimmed product (USDA ERS, 2015).

In the store case studies, no broccoli sold in a frozen form was produced in the U.S., but Table 3 shows the percent of the regional economic value-added activities. We also show the allocation of retail prices across one of the international supply chains for a frozen broccoli product—the one presented in Table 3 originated in Guatemala.

From the secondary data analysis (Table 5), we see that the average price per pound in that year was significantly higher for non-low-income households, and significantly lower in non-urban locations. In the EFSNE intercept surveys, 43% had purchased frozen broccoli in the last month

Table 5. Purchasing Patterns of Market Basket Items in the Northeast IRI Consumer Network Panel Sample, by Income and Rural/Urban Status

Market basket item	Type	Percentage of Households Purchasing in 2012 (%)				Price Paid Per Unit (US\$)				Percentage Purchased in Supercenters (%)				Percentage Purchased in Grocery Stores (%)			
		Low-income	Non-Low income	Urban	Non-urban	Low-income	Non-Low income	Urban	Non-urban	Low-income	Non-Low income	Urban	Non-urban	Low-income	Non-Low income	Urban	Non-urban
Potatoes		61	63	62	72*	0.63	0.72*	0.70	0.65	10	7*	7	18*	77	80	80	76*
Frozen broccoli		36	40*	39	38	1.69	1.82*	1.79	1.68*	12	7*	7	23*	77	80	80	72*
Canned peaches		31	29	29	39*	1.63	1.73*	1.71	1.65	15	10*	9	25*	67	75*	74	62*
Bread	White	62	55*	55	71*	1.35	1.53*	1.48	1.43	10	7*	6	20*	74	81*	80	70*
	Wheat	50	51	51	50	1.75	1.93*	1.89	1.81	10	7*	7	20*	72	73	74	67*
Milk	Whole	49	42*	44	44	4.45	4.84*	4.77	4.29*	10	6*	6	18*	68	74*	73	67*
	1%, or 2%, or fat free	76	82*	80	82	4.18	4.40*	4.40	3.80*	10	7*	6	20*	70	73	73	68*
Ground beef	Regular (fat >15%)	14	9*	9	20*	2.85	3.02*	2.95	3.00	52	46	43	71*	30	33	35	20*
	Lean (fat ≤15%)	6	8*	7	10*	4.69	4.93	4.92	4.59*	56	41*	41	69*	25	32	32	23

Source: Cleary, Bonanno, & Cho, 2017.

* indicates a statistical difference between the means of each pair of groups (low-income vs. non low-income and urban vs. non-urban) at at least the 1% level.

(see Table 4).

Canned peaches. Peaches are the most popular canned fruit in the U.S. as measured by per-capita consumption (USDA ERS, 2016b). In 2015, 97% of those peaches were grown and processed in California (USDA NASS, 2016e). The fruit is grown in the Northeast for fresh use (2.3% of the U.S. total), and also for processing (another 5% by volume) (USDA NASS, 2017). None of the canned peaches sold in the stores originated in the Northeast, but the distributors of canned peaches to four of the stores were located in the region.

Bread. While wheat was once produced in the Northeast in abundant quantities (Northern Grain Growers Association, n.d.), it is highly unlikely that bread produced for the mass market in the region is made from Northeast wheat at this time. Although some wheat is grown in 42 of the 50 states, none of the top 10 state producers is in the Northeast (USDA NASS, 2016b). The RSR (percent of regional consumption met by regional production, divided by 100) for all food grains is about 8% percent, but it is not possible to calculate a separate value for wheat. There is little public information collected or available about the bread industry; we assume that the bread sold in the project stores is not made with flour grown in the region.

Bread baking, wholesaling, and retailing are different from wheat production in that the supply-chain case studies and discussions with store owners suggest that a significant amount of bread is baked in the region. In the store inventories (where we examined two each of white and whole-wheat loaves of different brands because so many breads were available) we can determine that across stores about 70% of the breads were manufactured and distributed in the region.

In the secondary data analysis of respondents from the Northeast, about 50% of the sample households had purchased wheat bread. Significant differences in variables are found with regard to white bread prices and purchasing. See Table 4 for characteristics of bread purchasers from the intercept surveys.

Milk. In 2015 all the states in the Northeast region had operating dairy farms, with two of them, New York (4) and Pennsylvania (5), in the top five producing states (USDA NASS, 2016d).

Dairy-farm operators located in the Northeast have about 15% of all milk cows in the U.S. and account for about 15% of total U.S. production by pounds (30.4 million or 13.8 million kg) and value (US\$5.5 billion) (USDA NASS, 2016d).

In the store inventories, we recorded information about whole, 2%, and 1% milk. The Northeast was the source of about 70% of each type of milk. The allocations of the retail price across the supply chains are shown in Table 3.

Table 5 contains information from the secondary analysis of households from the Northeast. Low-fat milk (0%, 1%, and 2%) was purchased by about 80% of respondents, while the intercept survey data show that 44% purchased low-fat milk in the last month; see Table 4.

Ground beef. Ground beef is the most consumed form of beef in the U.S., representing 63% of total food service beef volume and 37% of beef revenue, and representing 49% of retail beef volume and 39% of beef revenue (Speer, Brink, & McCully, 2015). Although the Northeast is not a major beef-cattle producing region, two of the states (New York and Pennsylvania) are in the top five milk-producing states in the country (see milk description above). A decade ago, an analysis was published reporting that about 25% of dairy cattle are removed from production every year (Lowe & Gereffi, 2009) because of lowered performance or productivity following 4 to 6 years of production. Most of the meat from culled dairy cows is processed into ground beef for fast food or supermarket retail (Lowe & Gereffi, 2009). In 2014 about 20% of the total number of culled cows in the U.S. (USDA NASS, 2016c) entered the ground beef supply chain from the Northeast.

The RSR calculation for all beef in the Northeast is 16%. The value-added through the wholesaler and retailer for ground beef was 38% in one store and 29% in the other.

In the secondary data analysis of households in the Northeast region (Table 5), the percentage purchasing regular ground beef varied by income and urban/non-urban locations. There was a significant difference in the type of store in which non-urban households purchased ground beef; they purchased much more frequently from superstores. Table 5 shows the purchases by different groups.

Models

For many decades, agricultural scientists have utilized modeling to explore multiple facets of agricultural systems for many different purposes. These purposes include predicting the future production of crops, arriving at a better understanding of environmental effects, simulating the effects of shocks to the system, such as increased demand or climate change, and many other objectives (Jones et al., 2017). EFSNE researchers developed models that explore scenarios for six of the market basket foods. Table 6 presents a summary of these models. They offer critical information as to the leverage points for increasing production capacity and food security in the region, and so are presented here in some detail.

Distribution team members utilized a disaggregated price-equilibrium model to answer the question of which approach to reducing carbon dioxide emissions would be the best strategy for the apple industry to pursue (Alkhannan, Lee, Gómez, & Gao, 2017). Using different simulations they applied their model to the U.S. apple supply chain, studying production in six states, including New York and Pennsylvania, accounting for 90% of the

production in the U.S. Carbon dioxide emissions were used as a measure of environmental impact; apple production quantities and producer and retail prices were some measures of economic impact. The researchers considered three different strategies: (1) a carbon tax to penalize emissions; (2) a land-sparing mechanism in which apple production yields increase and the spared land sequesters carbon; and (3) investments in new storage technologies that emit less carbon dioxide. They concluded that improved storage technologies seem to have the potential to reduce emissions to a greater extent than land-sparing efforts. Moreover, when they combined several strategies they found that a carbon tax along with storage innovations demonstrated even more potential to reduce emissions, and provided the lowest increase in apple prices per pound for consumers.

Another output from the Distribution team is a model that estimates the supply chain impacts of demand for cabbage, increased enough to close the current gap between actual and recommended consumption of dark leafy greens for low- and middle-income populations (Yeh, Nishi, & Gómez, 2017).

Table 6. Overview of Models Used to Explore Six Market Basket Items in Northeast Region

EFSNE team	Market basket item	Model type	Simulated scenarios	Simulated outcomes
Distribution	Apples	Spatially and temporally disaggregated price equilibrium	Ways to reduce CO ₂ emissions (carbon tax, land-sparing mechanisms, investments in new storage technologies)	Best choices to reduce emissions
Distribution	Cabbage	Spatially-disaggregated-intertemporal transshipment	Increased demand for fresh cabbage	Production potential, supply chain and retailer costs, optimal regions and seasons for increased production
Distribution	Broccoli	Production-transportation optimization	Increased regionalization of fresh supply chains	Supply chain and consumer costs, food miles
Distribution	Milk	Spatially disaggregated transshipment	Increased localization of supply chains	Food miles, GHG emissions, employment, economic activity
Production	Potatoes	Geo-spatial crop	Increased land use for potato production Projected regional impacts of climate change	Production potential and adaptations
Production	Winter wheat	Geo-spatial crop	Projected regional impacts of climate change	Production potential and adaptations

Specifically, the researchers asked what would happen if the number of acres devoted to cabbage for the fresh market and coleslaw could increase, and where such an increase could occur. The study included all regions in the U.S. and seasonal differences in both production and consumption. Under a scenario of a 10% increase in demand, total domestic production increases 247 million pounds (112 million kg), and supply-chain costs increase about 13%. However, wholesale prices increase by 38% relative to the baseline, an increase that could incentivize growers to increase production until demand is met, but would mean higher cost for consumers during the transition. In the second simulation, the researchers determined the optimal regions and seasons that could increase production to avoid the high increases in cost. According to the model, New York in the fall season is the optimal supply location/season for acreage expansion. The total supply-chain costs decrease in this model, and retail prices increase only minimally. About half the additional demand for cabbage in the Northeast is likely to be met within the region in this scenario, and New York could supply cabbage to other regions in the fall. Arizona and northern Florida were the optimal locations for spring production.

Distribution team members used a production and transportation model to determine the cost of increased regionalization of fresh broccoli, asking how supply chain costs and consumer prices change when production is reallocated across space and seasons (Atallah et al., 2014). The researchers used the broccoli-producing regions on the Eastern Seaboard as their focus, which include five Southern states not in the Northeast region. Put simply, the findings are that increasing broccoli acreages in the East increases annual supply chain costs by 1%, while production costs increase by less than 1% because lower transportation costs offset the increase in production costs. The reduction in transportation costs is responsible for a decrease in the marginal cost of broccoli in some eastern locations.

It is clear from the RSR and other measures that milk is a strongly regionalized commodity in the Northeast; it is shipped across the states in the

region. An exercise to model the effects of localizing the dairy supply chain (that is, to constrain shipment and purchase of milk to a geographic boundary such as a state) examined fuel use, economic, and job effects. The research demonstrated that localization would lead to longer distances traveled by fluid milk and other dairy products, and an increase in greenhouse gas emissions. Furthermore, gains in employment and economic activity would be modest, increasing by only a few jobs and a small percentage of the economic activity of the Northeast dairy industry per month (Nicholson, He, Gómez, Gao, & Hill, 2015).

Members of the production team used a geospatial crop-modeling tool to compare current production with potential production of potatoes in the Northeast under different land use and climate scenarios (Mutibwa, Fleisher, Resop, & Timlin, 2017; Resop, Fleisher, Timlin, Mutibwa, & Reddy, 2016). The first phase of the study concluded that a large amount of land is potentially available for potato production—but less is available if limitations are taken into account, such as rocky soils, the question of substitution for other crops, climate conditions, and water availability. In one scenario, the researchers calculated that if each county in the region added an additional 123 acres (50 hectares) of land for potato production, there was the potential to produce 41% more potatoes. The same team also assessed the impacts of mid-century (2050–2080) climate change on potatoes. The results indicated that potatoes were highly sensitive to projected increases in temperature, with reductions in yield ranging between 30% and 70% from historical values if adaptation measures such as adjusting planting dates were not taken. Simple measures like this could reduce the negative impact by roughly half the projections.

Using the same methodology as employed in the potato study, a model for winter wheat was used by the Production team to assess potential production capacity and climate change responses in the region (Mutibwa et al., 2017). Among other things, the study indicated that there was a higher potential for increasing grain yields in Maine. Mid-century (2050–2080) predicted climate impacts on winter wheat production were positive in all states:

an average yield increase of about 1.7 Mg per hectare, or an increase of 50% with respect to historical data, was simulated. This result was primarily due to projected increases in air temperatures, and suggests the region may have the capacity to generate more of its own wheat supply in the future.

Discussion

In the EFSNE project we have examined a number of components of food security for the entire region, as well as the community food security of lower-income areas in the region. Among other methods, we have illuminated these components through the use of a market basket of eight foods. By examining the same foods through the lenses of multiple disciplines we have built a rich picture of each. In this section we describe our findings in the aggregate and identify some of the knowledge gaps that should be filled in order to proceed with activities and interventions to enhance the region's long-term food security.

One of the obvious ways to expand production volume and variety is to expand the geographic area from which food is sourced in a sustainable way (Ruhf & Clancy, 2010). Our objectives of determining which of the market basket foods are produced in the region, as well as which are found in the stores in low-income areas, have been met through several analyses. There is a broad spectrum of RSR proportions (see Table 2) verifying that some foods are more inherently regional (apples, cabbage, milk, and potatoes) than others (bread, beef, frozen broccoli, and canned peaches). We found that 100% of the milk, over 75% of the apples, almost 50% of the potatoes in the two stores, and about 35% of the cabbage in one of the stores were produced in the Northeast. Yet we also demonstrate that the economic value added at the regional level from the activities of downstream supply-chain members is impactful, and it extends to the other market basket foods, ranging from 76% for frozen broccoli and 50% for canned peaches to 38% for ground beef. More research is needed on a variety of foods to identify those that could be produced and distributed in larger amounts in the region, as well as the necessary resources and policies.

Two-thirds of intercept survey respondents

responded that they had purchased potatoes in the last month, 52% had purchased apples, and 43% had purchased frozen broccoli, and thus the criterion of the market basket of items being purchased by shoppers in low-income areas was met. A higher share of respondents purchased low-fat milk compared to whole (44% versus 29%) in the last month; a slightly higher share had purchased more whole-wheat bread (44%) than white (40%); and about the same share had purchased ground beef (regular fat [25%] and lean [26%]). One of the market basket items was purchased with a lower frequency: about one-fourth of respondents had purchased canned peaches. Female respondents and those with more children under five years of age were purchasers of the most market basket items. Nutrition program participant purchasers of market basket items tended to have more children under five years of age and have fewer years of education.

In the secondary data analysis of households in the Northeast region (Cleary et al., 2017), we corroborate the findings above by demonstrating that a higher share of low-income than non-low-income households bought more market basket items. This is likely due to the fact that this particular data set includes only information regarding food at home as does the intercept survey data, and non-low-income households eat out more (U.S. Bureau of Labor Statistics, 2014). For all market items except lean beef, low-income households paid a lower average price. This is a welcome finding, even though we cannot say that the foods are affordable for all households.

These purchasing analyses help us to better understand urban and rural food security issues and are being integrated with other findings to uncover more connections. For example, our third objective was to identify leverage points in supply chains for increasing the amounts of these foods entering supermarkets in low-income areas. In many of the supply-chain cases we looked at (and in other research, for example King et al., 2010), wholesalers wield a lot of control over what products are available to retailers, especially those supplying the large chains of smaller supermarkets, such as the Save-A-Lot supermarkets (Park, Gómez, & Clancy, 2017). More analysis is needed to discern how the procurement, sales, and profits

of these distributors can be served while supporting regional entities.

Finally, retailers play a critical role in expanding markets for regionally produced and processed foods. We saw that owners and managers of stores participating in the project who have more autonomy than national chain stores are searching out both local and regionally produced products for their stores. This is an added burden, but one they are willing to undertake to meet their customers' requests (Park et al., 2017). Supply chains that value regionally produced food will be able to make this easier for supermarket owners.

By definition, a region will have a larger land base than a local area to utilize in meeting food needs. But that land base has to be kept for, and in, production (Ruhf & Clancy, 2010). In this vein, the models are a useful starting point for more research that examines how to increase production capacity in the future. They offer optimistic scenarios of apple supply chains that limit carbon dioxide emissions, increased cabbage production in the fall season in New York, potato grower adaptations to climate change, greatly increased production on small additional acreages across Northeast counties, significantly increased broccoli production in the Northeast at minimal cost to producers and consumers, a good potential to increase winter wheat production in the region, and the benefits of maintaining the milk supply chain as a regional construct.

All the scenarios above are within the realm of possibility, although all have limitations. It could be profitable to increase potato production to the level it was prior to 2002, before the loss of a great deal of land used to grow potato in the Northeast, given the issues of increasing temperatures and scarcer water supplies in some parts of the country. If growers decide to adopt new varieties and grow more broccoli in the region, a larger portion of Northeast demand could be met and some might be frozen as well. There are several efforts underway to increase the production of organic wheat suitable for bread-making (Podhaizer, 2008). Although these efforts may not meet the volume demand of the region's bakers for production of bread for the mass market, this research is a useful contribution to self-reliance.

Conclusions

Although the EFSNE project worked with a small market basket, we believe that the information from this research points to a number of useful lessons. First, we found it instructive to study the entire supply chain. It has not been a common practice in food supply-chain studies to feature the value added by all parts of the chain, but instead to focus more on returns to producers. As previously discussed, this value added to the region from downstream chain members is significant for many products.

We also suggest moderating the oft-delivered message to consumers that fresh foods are more important in diets than other forms, because continuing consumption of non-fresh foods could benefit all supply-chain actors. Frozen and canned foods are critical season-extenders, especially of foods grown in the higher latitudes of the Northeast (and other similar regions). In addition, lower-income households that have less access to fresh foods could benefit nutritionally from purchasing processed foods. Processed foods also provide more income to regional producers and decrease transportation costs.

There is still much research needed to fill in gaps and better understand how parts of the systems that meet food security needs in the Northeast can be improved. We encourage more researchers to undertake this work utilizing regional, systems, and interdisciplinary approaches. Research at a regional level can offer a range of benefit to researchers, policymakers, and natural resource managers, and needs much more attention (Ericksen, Ingram, & Liverman, 2009). Furthermore, in order to assess sustained and equitable access to food security, appropriate research approaches need to be capable of capturing the interlinked relationships that compose the food system (Ericksen et al., 2009). One good example of this is supply-chain studies that do not require extensive resources, but are enhanced by the participation of researchers from relevant disciplines.

Inter- and/or transdisciplinary research is an important way to understand the complexity, contradictions, and the complementarities of food systems, but there are few integrated examples in

the U.S. (see Institute of Medicine & National Research Council, 2015). We have started to operationalize this integration in EFSNE and believe that we have helped lay the groundwork for a better understanding of food systems in general, and the Northeast food system in particular. We urge scholars and practitioners to take a broader and deeper view of their regions through a systems lens in order to advance

thinking and action related to scale, supply chains, biodiversity, resiliency, and other elements critical to long-term food security.

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References

- Agriculture and Agri-Food Canada. (2012). *American eating trends report: Bread*. Retrieved from <http://www.agr.gc.ca/resources/prod/Internet-Internet/MISB-DGSIM/ATS-SEA/PDF/6257-eng.pdf>
- Alkhanhann, F. M. M., Lee, J., Gómez, M. I., & Gao, H. (2017). A systems approach to carbon policy for fruit supply chains: Carbon-tax, innovation in storage technologies or land-sparing? (Working Paper No. 2017-04). Retrieved from <https://dyson.cornell.edu/faculty-research/working-papers/documents/WP-17-04.pdf>
- Atallah, S. S., Gómez, M. I., & Björkman, T. (2014). Localization effects for a fresh vegetable product supply chain: Broccoli in the eastern United States. *Food Policy*, 49(1), 151–159. <https://doi.org/10.1016/j.foodpol.2014.07.005>
- Clary, R., Bonanno, A., & Cho, C. (2017). *Describing U.S. households' food purchasing patterns across poverty and urban status: The EFSNE project market basket*. Retrieved from <http://aese.psu.edu/nercrd/publications/rdp/describing-US-households-food-purchasing-patterns-efsne-market-basket>
- Ericksen, P. J., Ingram, J. S. I., & Liverman, D. M. (2009). Food security and global environmental change: Emerging challenges. *Environmental Science & Policy*, 12(4), 373–377. <https://doi.org/10.1016/j.envsci.2009.04.007>
- Griffin, T., Conrad, Z., Peters, C., Ridberg, R., & Tyler, E. P. (2014). Regional self-reliance of the Northeast food system. *Renewable Agriculture and Food Systems*, 30(4), 349–363. <https://doi.org/10.1017/S1742170514000027>
- Institute of Medicine & National Research Council. (2015). *A framework for assessing effects of the food system*. Washington, D.C.: The National Academies Press. <http://dx.doi.org/10.17226/18846>
- Jones, J. W., Antle, J. M., Basso, B., Boote, K. J., Conant, R. T., Foster, I., ... Wheeler, T. R. (2017). Brief history of agricultural systems modeling. *Agricultural Systems*, 155, 240–254. <https://doi.org/10.1016/j.agsy.2016.05.014>
- King, R. P., Hand, M. S., DiGiacomo, G., Clancy, K., Gómez, M. I., Hardesty, S. D., ... McLaughlin, E. W. (2010). *Comparing the structure, size, and performance of local and mainstream food supply chains* (Economic Research Report No. 99). Retrieved from <https://www.ers.usda.gov/publications/pub-details/?pubid=46407>
- Lowe, M., & Gereffi, G. (2009). *A value chain analysis of the U.S. beef and dairy industries*. Retrieved from <http://www.oecommunity.com/sites/default/files/Value%20Chain%20Beef%20%26%20Dairy.pdf>
- McKinnon, R. A., Reedy, J., Morrisette, M. A., Lytle, L. A., & Yaroch, A. L. (2009). Measures of the food environment: A compilation of the literature, 1990–2007. *American Journal of Preventive Medicine*, 36(4, Supplement), S124–S133. <https://dx.doi.org/10.1016/j.amepre.2009.01.012>
- Muth, M. K., Sweitzer, M., Brown, D., Capogrossi, K., Karns, S., Levin, D., ... Zhen, C. (2016). *Understanding IRI household-based and store-based scanner data*. Retrieved from <https://econpapers.repec.org/RePEc:ags:uerstb:234905>
- Mutiibwa, D., Fleisher, D., Resop, J., & Timlin, D. (2017). *Regional food production and the potential of land redistribution adaptation to climate change in the US Northeast seaboard*. Manuscript in preparation.
- Nicholson, C. F., He, X., Gómez, M. I., Gao, H. O., & Hill, E. (2015). Environmental and economic impacts of localizing food systems: The case of dairy supply chains in the northeastern United States. *Environmental Science & Technology*, 49(20), 12005–12014. <https://doi.org/10.1021/acs.est.5b02892>
- Northern Grain Growers Association. (n.d.). Vermont grains history. Retrieved April 10, 2017, from <http://northerngraingrowers.org/vermont-grains-history>
- Park, K., Gómez, M., & Clancy, K. (2017). *Case studies of supermarkets and food supply chains in low income areas of the Northeast*. Report in preparation.

- Peters, C., Clancy, K., Hinrichs, C., & Goetz, S. (2017). Introduction to the EFSNE project collection of papers. *Journal of Agriculture, Food Systems, and Community Development*, 7(4), 159–162.
<https://doi.org/10.5304/jafscd.2017.074.019>
- Peters, C. J., Picardy, J., Darrouzet-Nardi, A. F., Wilkins, J. L., Griffin, T. S., & Fick, G. W. (2016). Carrying capacity of U.S. agricultural land: Ten diet scenarios. *Elementa: Science of the Anthropocene*, 4.
<https://doi.org/10.12952/journal.elementa.000116>
- Podhaizer, S. (2008, October 15). No grain, no gain [Blog post]. Retrieved from
<http://www.sevendaysvt.com/vermont/no-grain-no-gain/Content?oid=2135384>
- Resop, J. P., Fleisher, D. H., Timlin, D. J., Mutibwa, D., & Reddy, V. R. (2016). Climate, water management, and land use: Estimating potential potato and corn production in the U.S. Northeastern Seaboard Region. *Transactions of the ASABE*, 59(6), 1539-1553. <https://doi.org/10.13031/trans.59.11748>
- Ruhf, K., & Clancy, K. (2010). *It takes a region: Exploring a regional food systems approach*. Retrieved from
<http://nesawg.org/sites/default/files/NESAWGRegionalFoodSystemFINALSept2010.pdf>
- Speer, N., Brink, T., & McCully, M. (2015). *Changes in the ground beef market and what it means for cattle producers*. Retrieved from https://www.angusonline.org/Fdn/Files/Research/WP_GroundBeefMarket.pdf
- U.S. Bureau of Labor Statistics. (2014, September). Consumer Expenditure Survey 2012, Table 1101. Retrieved from
<https://www.bls.gov/cex/2013/combined/quintile.pdf>
- U.S. Department of Agriculture, Economic Research Service [USDA ERS]. (2015). *Vegetables and pulses yearbook*. Retrieved January 19, 2017, from
<http://usda.mannlib.cornell.edu/usda/ers/VEGANDPULSESYEARBOOK/2015/index.html>
- USDA ERS. (2016a). *Fruit and tree nuts yearbook tables*. Retrieved January 19, 2017, from <https://www.ers.usda.gov/data-products/fruit-and-tree-nut-data/yearbook-tables/> - All Yearbook tables
- USDA ERS. (2016b, October 28). *Supply and utilization yearbook table*. Retrieved from <https://www.ers.usda.gov/data-products/fruit-and-tree-nut-data/yearbook-tables/>
- USDA ERS. (2017). *Data by commodity - Imports and exports*. Retrieved February 10, 2017, from
<https://data.ers.usda.gov/reports.aspx?programArea=veg&groupName=Vegetables&commodityName=Potatoes&ID=17858>
- USDA National Agricultural Statistics Service [USDA NASS]. (2016a). *Crop production, 2015 summary*. Retrieved from
<https://www.usda.gov/nass/PUBS/TODAYRPT/cropan16.pdf>
- USDA NASS. (2016b). *Vegetables, 2015 summary*. Retrieved from
<http://usda.mannlib.cornell.edu/usda/nass/VegeSumm//2010s/2016/VegeSumm-02-04-2016.pdf>
- USDA NASS. (2016c). *Livestock slaughter, 2015 summary*. Retrieved from
<http://usda.mannlib.cornell.edu/usda/nass/LiveSlauSu/2010s/2016/LiveSlauSu-04-20-2016.pdf>
- USDA NASS. (2016d). *Milk production, disposition, and income, 2015 summary*. Retrieved from
<http://usda.mannlib.cornell.edu/usda/nass/MilkProdDi//2010s/2016/MilkProdDi-04-28-2016.pdf>
- USDA NASS. (2016e). *Non-citrus fruits and nuts, 2015 summary*. Retrieved from
<http://usda.mannlib.cornell.edu/usda/nass/NoncFruiNu//2010s/2016/NoncFruiNu-07-06-2016.pdf>
- USDA NASS. (2016f, September). *Potatoes, 2015 summary*. Retrieved from
<http://usda.mannlib.cornell.edu/usda/nass/Pota//2010s/2016/Pota-09-15-2016.pdf>
- USDA NASS. (2017). Quick Stats [Online data portal]. Retrieved April 7, 2017, from <https://quickstats.nass.usda.gov>
- Yeh, D. A., Nishi, I., & Gómez, M. (2017). *Supply chain impacts of vegetable demand growth: The case of cabbage in the U.S.* (Working Paper 2017-05). Retrieved from
<http://publications.dyson.cornell.edu/research/researchpdf/wp/2017/Cornell-Dyson-wp1705.pdf>

Engaging multiple audiences: Challenges and strategies in complex food systems projects



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Abstract

Complex projects must manage many challenges, including how to communicate about them. In this

commentary, we present and assess the extension and outreach objectives, activities, challenges and outcomes of a complex, inter-disciplinary food systems research project called Enhancing Food Security in the Northeast through Regional Food Systems (EFSNE) project. As an integrated

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project—defined by USDA as including research, education, and extension—EFSNE focused on the regional food system of 12 Northeast states. EFSNE's Outreach Team met the project's outreach objectives by proactively sharing project findings with multiple audiences including participating low-income communities in a variety of ways. We outline the unique framework and rationale from which multiple outreach activities were conducted during the six years of the project. We also describe challenges we faced along the way, including the tension between research and community engagement, and the translation of complex research to multiple audiences. While complex systems projects often take several years to produce results, we believe that a contextually appropriate, coordinated and meaningful ways throughout the project provides significant benefits to multiple stakeholder audiences as well as to the project itself. We believe this compilation of our outreach strategies may inform similar work in other large, integrated complex regional research projects.

Keywords

Learning Community; Stakeholder Engagement; Communities of Practice; Community Readiness Model; Systems Modeling, Extension

Introduction

Complex projects must manage many challenges, including how to communicate with multiple audiences. We present and assess the extension and outreach objectives, activities, challenges and outcomes of a complex, interdisciplinary food systems research project called Enhancing Food Security in the Northeast through Regional Food Systems (EFSNE). As an integrated project—defined by USDA as including research, education, and extension—EFSNE focused on the regional food system of 12 U.S. Northeast states.

EFSNE was an interdisciplinary project funded by the USDA Agriculture and Food Research Initiative (2011-2017). EFSNE's Outreach Team (OT) employed several creative methods to proactively share findings with multiple audiences *and* to engage with leaders in the participating communities. We used a common

understanding of extension as educational activities that deliver science-based knowledge (research and education) directly to people (USDA National Institute of Food and Agriculture, 2017). Outreach is similarly defined as “efforts to bring services or information to people where they live or spend time” (“Outreach,” n.d., para. 1).

The EFSNE Project was designed to assess whether greater reliance on regionally produced foods could improve food access for low income-communities in the Northeast while also benefiting farmers, supply chain firms and others in the food system. The project examined structural and community dimensions of certain regionally, nationally, and globally produced and distributed food items. We selected community leaders and storeowners in nine case study locations chosen based on a set of considerations including geographic distribution across the region, rural and urban settings, and demographics/. EFSNE was not a participatory research project in which community stakeholders were part of the design team. Nor did we involve many community members in decision-making or research activities, often referred to as “stakeholder engagement.” We did (1) recruit site leaders who helped plan and implement many parts of the project, (2) interview store owners and provide feedback to them on our findings, (3) train and utilize community members to conduct focus groups and administer intercept surveys, (4) conduct community readiness interviews, and (5) host a workshop where community leaders and store owners shared knowledge and experiences with project researchers and each other.

The growing enthusiasm among professional and general audiences toward local and regional food systems created an opportunity for multiple outreach and extension interactions between fellow researchers, NGOs, policymakers, and businesses across the country. To engage these groups meaningfully we had to clearly explain the project's complexities and nuances, paying careful attention to language, vocabulary, and context in all project materials and correspondence.

The EFSNE Project was organized around Production, Distribution and Consumption research teams, and the Scenarios and Models, Education, Outreach, and Evaluation teams. The

OT was led by a person from outside academia and government, and included several Extension educators and a communication staff person from the host Northeast Regional Center for Rural Development at Penn State University.

While not a *participatory research* project in which the research planned and conducted with the people whose actions were under study, we sought to be transparent by acknowledging the creative tension between “studying” a community and working with a community in meaningful ways to support its objectives. As one community leader remarked, “It can’t just be ‘here they [researchers] come again’.” Early on, the OT envisioned a “two-way street” approach as essential to the success and legitimacy of the project. This meant not only disseminating knowledge and research highlights but also engaging key audiences. The project depended on the active involvement of communities in nine urban and rural locations across the Northeast, chosen in part based on their potential receptivity to a project like EFSNE.

Strategic Outreach Plan

This complex and ambitious project required getting a handle on the universe of stakeholders; to identify what behavior(s) we desired from each stakeholder audience, the OT produced a strategic stakeholder matrix. Table 1 shows how different stakeholder groups engaged with the project.

For example, we desired that agri-food entities gain knowledge about the Northeast food system through the newsletter, website, publications, events, and learning communities. We wanted leaders in our community sites to learn more about *their* food system, participate in and “ground truth” the project’s research activities, and when relevant, apply knowledge gained in their own work. The project also developed pathways to the nine project locations. Local leaders were recruited to serve as liaison between the project and specific communities and to help identify study stores, attend project workshops, engage in community focus groups, and organize local project-related “learning community” events. The strategic outreach plan was the roadmap for the project’s outreach and extension activities described here.

Events and Online Presence

Between 2011 and 2016, Team members delivered over 80 presentations and webinars about or related to project research and other activities. The variety of venues (from the American Society of Agronomy to the Transportation Research Board) is a testament to the project’s commitment to broad engagement, and conversely to broad interest in EFSNE. A full list is maintained on the project website.¹ Each project year, EFSNE gave a workshop at the Northeast Sustainable Agriculture Working Group’s (NESAWG) “It Takes a Region” conference. Our intention was to distill but not dilute the project’s complexities for a diverse audience. Each session was designed to solicit feedback from the audience, which helped the Teams develop a more relevant frame for their work.

In 2013, EFSNE brought community leaders and supermarket owners from several project sites together with EFSNE researchers. This two-day meeting enhanced community leaders’ understanding and knowledge of the research and researchers’ knowledge and understanding of community efforts and business realities in the project locations. It provided storeowners a platform to share stories with their peers, and a critical business perspective to the research project. Furthermore, it cultivated interest among communities and encouraged their involvement with the project’s investigations and their own food system activities.

Not all nine locations were represented however, which prevented the meeting from achieving its full potential, and underscored the persistent challenges in engaging communities in these types of endeavors. Community leaders reported that they felt more empowered and interested to work for changes in food access, and to share project findings. Storeowners reported deep satisfaction in sharing their successes and challenges and interacting with their peers.

In 2015, the OT organized a national conference to share the project with academics, policy-makers, government staff, students and community leaders, feature findings to date, showcase and connect “sister” AFRI projects, and gather feedback to inform the project’s concluding phase.

¹ <http://agsci.psu.edu/research/food-security>

Attendees included USDA senior staff and select professionals and policy leaders in the field.

The project website and email newsletter, while inherently one-way, were effective means of supporting the project's "two-way street" framework. The website enabled all stakeholders to learn about whatever aspects of the project interested them. For instance, community leaders could find information about their locale, learn about community-level activities, or download presentation files prepared by team researchers. The website pro-

vides a comprehensive and accessible explanation of the project structure, objectives, research activities, and information on locations and study sites.

The project newsletter was a venue for explanatory storytelling about how we were carrying out our work, why we were studying particular issues, and how our findings might be applied in research or policymaking. In writing these stories, we strived to remove barriers preventing those without a scientific background from approaching our research. For example, we featured an article on

Table 1. Stakeholders and Interactions

Stakeholder categories	Interactions
Academics and Extension	<ul style="list-style-type: none"> • Read project publications and/or view presentations • Attend workshops/national conference • Attend community/researcher workshop • Provide feedback • Join Learning Community and/or Community of Practice • Keep current with project via website and newsletter
Community leaders and groups (specific to EFSNE sites, and others not related to the project or necessarily to agriculture and food such as regional planning agencies)	<ul style="list-style-type: none"> • Participate in research/community activities including reviewing surveys and focus group guides • Attend workshops/national conference • Attend community/researcher workshop • Provide feedback • Keep current with project via website and newsletter • Consume public coverage (press releases, newswires, etc.)
Store owners	<ul style="list-style-type: none"> • Participate in research (store inventories, supply chain case studies, etc.) • Attend community/researcher workshop • Keep current with project via website and newsletter
Agri-food entities (NGOs, businesses, farmer groups, and food and agriculture networks) within the Project, the Northeast region, and beyond	<ul style="list-style-type: none"> • Keep current with project via website and newsletter • Attend national conference
Students (part of EFSNE, others involved in agri-food research, and others)	<ul style="list-style-type: none"> • Attend workshops/national conference • Attend community/researcher workshop • Read project publications and/or view presentations • Keep current with project via website and newsletter
Funders (Government and agency personnel, as well as private funding organizations)	<ul style="list-style-type: none"> • Contribute resources (financial/other) • Attend national conference • Provide feedback • Keep current with project via website and newsletter • Read project publications and/or view presentations • Consume public coverage (press releases, newswires, etc.)
Other contemporaneous AFRI Global Food Security projects	<ul style="list-style-type: none"> • Keep current with project via website and newsletter • Read project publications and/or view presentations • Attend workshops/national conference
The media	<ul style="list-style-type: none"> • Interview team members, attend events, and write and publish news stories • Read project website, publications, and/or presentations

the EFSNE market basket to explain the concept of the market basket research approach, and how the chosen foods related to various project research activities.

Community Readiness Model

As project researchers interacted with community leaders, it became clear that the communities displayed different capacities to engage in the research activities and/or to conduct community-based “activities.” To understand the extent to which communities were—or could be—engaged in food access work, we conducted a “community readiness” study based on the theory that communities progress through stages of change in relation to an issue, as do individuals. The Community Readiness Model (CRM) assesses and builds on how ready a community is to address a social issue (Tri-Ethnic Center, Colorado State University, 2017). Using food access as the topic, a project researcher interviewed four community leaders in each of six project locations to assess organizational resources, capacity and attitudes of their respective communities (Silwa et al., 2011). Leaders described how their communities had addressed food access and what might be appropriate next steps to increase access to healthy food for all community members.

CRM posits six elements of community readiness, and assigns a score based on the interviews. For example, the data showed that the *resource*, *leadership* and *efforts* dimensions consistently yielded higher scores than the *knowledge of the issue*, *knowledge of the efforts* and *community climate* dimensions in all communities. The CRM indicators revealed that project communities have active leaders planning efforts, but with modest community support. The overall readiness scores indicated that the three urban communities were a bit more advanced on the scale than the three rural communities.

The data from the CRM transcripts enhanced the team’s understanding of the communities and the larger EFSNE project. They provided descriptive information about programs, policies, leadership and resources that could be leveraged to plan, implement and sustain greater food access. Qualitative data also provided information about each community’s challenges and obstacles.

Each location was asked and supported to

create a community event that would highlight project findings, encourage communities to use the findings in their work, and enhance understanding of local and regional food system issues. Six locations took different approaches to execute engaging, interactive and place-based initiatives combining project results and local resources to animate the research findings.

eXtension Community of Practice

EFSNE’s core extension commitment was to engage colleagues interested in regional food systems. The OT pursued the Cooperative Extension System’s eXtension Community of Practice (eCoP) platform for virtual sharing of information and professional network-building to enhance the work of Extension and other professionals working on local and regional food systems. In 2011 the OT invited colleagues at the University of Wisconsin-Madison and Ohio State University—where similar eCoP initiatives were being explored—to collaborate. Together we recruited a national Leadership Team for the Community, Local and Regional Food Systems (CLRFS) eCoP which convened in 2012. Penn State University, EFSNE’s host institution, received eXtension funding to develop this eCoP, and a national meeting of the CLRFS eCoP was held later that year. Online content development, curation, and publishing began in the following year. A second national meeting was held in 2014. As of 2017, there are over 400 members of the CLRFS eCoP, the second largest in the eCoP stable. A national Leadership Team provides overall direction, with a steering team providing more direct management. Ohio State University Extension provides supporting administration, with hired part-time staff. Eight work groups provide the substance of the community’s work.

Food Systems Modeling Learning Community

The learning community (LC) concept was core to our vision of a compendium of methods to inform, teach, learn and network. Learning communities are groups of people in academic settings who share common interests, and meet regularly or periodically to pursue and exchange knowledge, and to collaborate. The LC framework can be

especially effective with interdisciplinary groups.

Food systems modeling emerged as a priority LC topic. System modeling is of increasing interest as an analytical tool for food systems researchers and practitioners. Several project researchers were engaged in modeling protocols, which generally aim to generate physical, conceptual or mathematical representations of phenomena to explain and predict the behavior of specific systems. The OT and EFSNE researchers who engage in modeling reached out to academics outside EFSNE who helped develop a food system modeling LC (FSMLC).

One purpose of the FSMLC was to strengthen members' work by providing a skilled and supportive academic community for building expertise, trust and a shared language. The FSMLC enabled both agricultural economic and bio-physical modelers doing work in food systems to share their best practices and challenges. The plan was to then reach out to Extension and other practitioners—"consumers" of food system modeling research and tools—to build their literacy to work with modelers. About fifteen academic professionals from across the country initially participated, holding eight webinar-based presentations on their food systems modeling work; more joined the following year. These activities fostered learning and developed trust among colleagues to share achievements and challenges. They also collected resources for engaging practitioners in food systems modeling which will be uploaded to the CLRFs eCoP.

Research Briefs

A priority extension goal was to make project findings accessible to its multiple stakeholder groups—a formidable challenge considering the highly technical and sometimes arcane research material. Publishing findings in scientific journals was important, but so was making the findings available—and understandable—to general audiences including practitioners and multiple stakeholder groups (see Table 1).

As project results became available, the OT produced research briefs that distill peer-reviewed journal articles authored by project team members into 2-to-4-page general-audience documents. Each

brief "decodes" technical language and translates data into common language and/or digestible graphic representations. Briefs describe methods and findings, and discuss their implications and applications. The briefs are disseminated through multiple channels, including the project website and newsletter, the CLRFs eCoP, and NESAWG's website.

Observations, Analysis and Lessons Learned

Overall, the project's multipronged extension efforts were successful, but not without challenges. Our strategic plan framework to achieve multiple objectives with multiple audiences set a strong guiding foundation for outreach. Our outcomes included a wide audience informed and educated about our work and the Northeast food system via multiple formats; target communities more engaged in food system activities and advocacy and constructive partners in research; new approaches for regional food system thinking and networking; and a model for communicating about complex, inter/transdisciplinary integrated projects.

Despite our desire for a "two-way street" we did not receive as much useful input and feedback as we had hoped. Furthermore, engagement with some of our project communities met with several obstacles and disappointments. The research questions were not easily actionable at the community level especially within the project timeline. For example, it was hard to deliver a broad message about regional food systems when most project communities were more focused on "local." Toward the project's end we were more able to integrate the project's work and effectively translate it to the communities. Observations suggest that at least two communities began to integrate the larger picture. Perhaps not coincidentally, these communities scored high in the community readiness assessment.

The tension we anticipated between community development and research turned out to be a reality on the ground. Ours was not a community intervention project, yet we suggested at the outset that we would bring something to communities that would enhance their own interests and efforts. The project did not bridge the gap between the community-as-research-site, communities' local


focus, and the research's regional scope as well as anticipated. A more appropriate action turned out to be the Community Readiness surveys, which helped community leaders assess—and act on—local capacity.

Translating the project was a challenge internally and with outside audiences. It was challenging initially for team members to understand the systems nature of the project and then to translate our work to communities and lay audiences. We needed to build internal capacity to translate our work and then apply it to project communities and audiences beyond. As the entire EFSNE team understood how the pieces fit together, we were better able to communicate that externally. For example, a project piece on transdisciplinary research was frequently referred to internally and widely viewed externally. The project required—and team members benefitted from—intensive internal project communications. The importance of a project communications staff person cannot be overstated. We employed a distributed review process that all project communications were subject to and that team members were expected to participate in. While onerous at times, this process helped ensure message consistency and optimized intra-project learning.

The CLRFS eCoP and the FSMLC proved to be successful and meaningful extensions of the EFSNE project. Each engaged a national network of peers and both have sound prospects for ongoing sustainability. These “legacy spin-offs”

achieved an important EFSNE goal—to engage educators, researchers and practitioners in “regional food systems thinking” of which the EFSNE project is a leading example.

Conclusion

This interrelated compilation of extension and outreach tactics can serve as an example for other inter- and transdisciplinary projects. While complex systems projects often take several years to produce results, communicating about them in appropriate, coordinated and meaningful ways to stakeholders throughout the project provides significant benefits to multiple audiences as well as to the project itself. While we outlined an outreach plan early in the project, we also remained flexible and creative in our execution. For example, the community readiness results elucidated differences among the locations that led to adjustments to the plan. Community events were tailored to stakeholders' interests in project results and implications, rather than based on an assumption that all locations would utilize the research findings. More traditional academic engagement occurred through the national conference and the annual NESAWG conference. Through the eXtentson CoP and the FSMLC, we created virtual opportunities to enhance learning with academic and practitioner communities beyond the Northeast. We believe the compilation of our outreach strategies we present here may inform similar work in other large, integrated complex regional research projects. 

References

- Outreach. (n.d.). In *Cambridge Dictionary online*. Retrieved May 22, 2017, from <http://dictionary.cambridge.org/us/dictionary/english/outreach>
- Silva, S., Goldberg, J. P., Clark, V., Collins, J., Edwards, R., Hyatt, R. R.,...Economos, C. D. (2011). Using the community readiness model to select communities for a community-wide obesity prevention intervention. *Preventing Chronic Disease*, 8(6), A150. Retrieved from http://www.cdc.gov/pcd/issues/2011/nov/10_0267.htm
- Tri-Ethnic Center for Prevention Research, Colorado State University. (2014). *Community readiness for community change*. Retrieved from http://triethniccenter.colostate.edu/communityReadiness_home.htm
- United States Department of Agriculture, National Institute of Food and Agriculture (USDA NIFA). (n.d.). Extension. Retrieved from <https://nifa.usda.gov/extension>

Between global and local: Exploring regional food systems from the perspectives of four communities in the U.S. Northeast



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Abstract

Emphasis on local foods and local food systems has often meant that the importance of other scales goes unrecognized or underappreciated. While each scale has limitations, some food system experts now assert the benefits of the regional scale for its ability to foster a more sufficient, diverse, affordable, and resilient food system. This paper contributes to this debate by exploring people's

perceptions of regionally produced foods. Seven focus groups were conducted with a total of 51 participants across four locations in the U.S. Northeast. Topics discussed included the importance of knowing where food is sourced, how people described their region, personal connections to the region, globalization of food, importance of food origin, perceived benefits and drawbacks of regional foods, and the sense of efficacy and engagement involving food. While many participants were familiar with the concept of

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the local food system, their perceptions of the regional scale were weaker, less formed, and more divergent. These focus groups provide foundational insights into emerging consumer definitions and values related to regional food systems, which may help develop appropriately targeted messages to reinforce regional benefits.

Keywords

Northeast; Regional Food System; Local Food System; Consumer/Public Perceptions; Scale; Immigrants

Introduction

Most Americans consume food that is sourced through international, national, regional, and local supply chains. Given seasonal availability, production capacity, interest in food variety, and resiliency challenges, all sizes of scale are important in the food supply and play roles in meeting food needs and preferences of residents of any given locale. Since the mid-1990s, local food systems have attracted growing attention and support from many actors within the food system, including producers, consumers, wholesalers, and retailers, for reducing food miles, fostering community connections, and supporting local agricultural economies (Low et al., 2015; Martinez et al., 2010). However, attention to local food has often obscured the potential importance and contribution of other scales. While each scale has its limitations, the regional scale has gained attention because of recent claims among food system experts that it is critical for building more resilient food systems (Harris et al., 2016; Jensen, 2010; Ruhf & Clancy, 2010).¹ In this paper, the regional scale relevant to farming and food is considered to be smaller than the national scale but larger than a delimited local community.

While there has been increasing attention to consumer perceptions regarding local food (Adams & Salois, 2010; Feldmann & Hamm, 2015; McFadden, 2015) and to broader public percep-

tions of the U.S. food system (Bostrom, 2005), there has been little research to date examining consumer views of regional food systems specifically (Darby, Batte, Ernst, & Roe, 2008; Hu, Batte, Woods, & Ernst, 2012; Onozaka, Nurse, & McFadden, 2010). This paper addresses this gap through an exploration of how residents perceive regionally produced foods in the Northeast U.S. Because few food shoppers distinguish between local and regional as food attributes, we also consider perceptions of how these scales overlap and relate to one another. Regions exist at various scales (e.g., Mid-Atlantic vs. Northeast) and are fluid (e.g., watershed, legislative districts) depending upon the issue under discussion (Ruhf & Clancy, 2010). Geographic regions such as Appalachia and the Shenandoah Valley appreciate their own food culture, often generated from regional agricultural products (Hilchey, 2008; Hu et al., 2012).

This paper reports on research conducted as part of a larger U.S. Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) project, Enhancing Food Security in the Northeast (EFSNE), which takes the 12 states from Maine to West Virginia, plus the District of Columbia, for its definition of the Northeast region. The EFSNE project aimed to assess whether greater reliance on regionally produced foods from the Northeast could improve food access for low-income communities, while also benefiting farmers, food supply-chain firms, and others in the food system. The original plan for the five-year EFSNE project included conducting focus groups with Northeast shoppers in Years Two and Four. In both waves, these core EFSNE focus groups included limited discussion about regional food, in addition to other topics. Given the lackluster findings on regional food issues from the core focus groups, we decided to conduct seven supplemental focus groups that more deliberately framed the regional context. After gathering unprompted impressions, we provided our definitions of regional and local foods to enhance the discussion. This paper reports predominantly on these supplementary focus group findings; additionally, we discuss results from a question added to Year Four EFSNE store intercept-surveys which asked

¹ As Born & Purcell (2006) argued in their pivotal article, "Avoiding the Local Trap," scale itself has no inherent merit; the contribution of a specific scale depends on how it serves a particular goal. If resilience is a central goal, the regional scale may be a particularly good means to that end.

customers from which geographic areas they prefer to source their food.

Literature Review

The increasingly complex globalized commodity chains through which most food is now produced, distributed, and sold—undergirding a “placeless foodscape” (Ilbery & Kneafsey, 2000, p. 319)—has been accompanied by growing efforts to re-spatialize the food system. Many of these initiatives concentrate on re-localizing food provenance under assumptions that such food is of superior quality, supports local economies, reconnects consumers and producers, and has a lower environmental footprint (e.g., through reducing the distance food travels from farm to plate) (Adams & Salois, 2010; Low et al., 2015; McFadden, 2015; Mount, 2012). While messages emphasizing “local foods” and “buy local” resonate strongly with advocates and the public at large—especially compared to alternative value-based labeling schemes (Howard & Allen, 2010)—what qualifies as “local” remains ambiguous and varies among consumers, producers, and retailers (Eriksen, 2013; McFadden, 2015). Most definitions reference geographical proximity, but this varies from anything grown (and/or processed) within 50 to 100 miles (80 to 161 kilometers) of where it is sold, to anything grown within the state (which may extend the radius to hundreds of miles in large states such as Texas and Alaska), province, or country (in the case of small European nations) (Eriksen, 2013). “Local” may also include an aspect of relational proximity, such as direct social relations between producer and consumer, and values of proximity, such as quality, freshness, traceability, and authenticity (Eriksen, 2013).

How the term “regional” relates to “local” adds complexity to such concepts, although food-system experts encourage advocates to adopt regional food system frameworks as well as local ones. Ruhf and Clancy (2010) argue that a regional framework, which is inclusive of local efforts but more than the sum of its parts, can maintain efficiencies of scale, thereby supplying a more significant proportion of regional food demand with greater volume, variety, and affordability than traditionally conceived “local” small-scale, niche, direct-to-consumer markets. Meanwhile, regional

approaches may still provide producers more flexibility to practice socially, ecologically, and economically sustainable practices through product and market differentiation than producers striving for maximum volume at minimum costs (many of which are externalized). Several critical components of food system resilience and sustainability could be more optimally addressed at regional scales—including water resources, land use, topography, market access, and farm scale—than at local or global levels (Harris et al., 2016). Organizing social institutions, economic development, and ecosystem interactions at optimal sustainable scales is becoming increasingly important as we seek to mitigate and adapt to climate change, economic crises, and other environmental and socio-political concerns (Harris et al., 2016; Newman & Dale, 2009).

Despite the unique attributes of regional approaches, local and regional food systems are often conflated or confused (Kneafsey, 2010; McFadden, 2015; Ruhf & Clancy, 2010). The USDA, for instance, typically uses “local and regional food systems” or “local/regional food systems” as an umbrella term to encompass direct and specialty marketing; farm-to-school; food business, processing, and hub infrastructure; and community food project initiatives (Low et al., 2015). The Federal Reserve follows a similar convention (Dumont et al., 2017). Many academics as well oscillate between the two terms without a clear distinction (Kneafsey, 2010).

Some have also noted the importance of differentiating between “regional foods” and “regional food systems or networks” (Kneafsey, 2010). “Regional foods” refer to foods whose qualities are associated with biophysical, cultural, and socio-political elements of a specific geographic area. They are often emboldened by geographical indication (GI) certifications, such as the European Union Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), and Traditional Specialty Guaranteed (TSG) system, which connect production and sometimes the processing and preparation of certain, mostly specialty, foods and drinks (e.g., Parmigiano-Reggiano cheese, Champagne, Welsh lamb) to specific territorial attributes. GI certification

abounds more in Southern Europe, where foods and cuisines are more embedded in spatial contexts and cultural identity, as exemplified by the French concept of *terroir* (Barham, 2003), than in the relatively placeless foodscapes of countries such as the UK (Sonnino, 2007) and the U.S. (Barham, Bingen, & Hinrichs, 2011). Nevertheless, British consumers also hold perceptions of “regional foods” that encompass food products and recipes produced in physical environments with specific climates, natural resources, and geomorphology, as well as linked to specific regional traditions, heritage, and socio-cultural practices (Kuznesof, Tregear, & Moxey, 1997; Tregear, Arfini, Belletti, & Maescotti, 2007).

While a few U.S. foods carry regional label protections (e.g., Vidalia onions, Tennessee whiskey), the salience of regional foods is largely absent in the American context. Some scholars have explored GI certifications in the U.S., but—contributing to the trend to conflate local and regional scales—have emphasized their potential to support local rather than regional² foods (Giovannucci, Barham, & Pirog, 2010). Only a few studies have differentiated between local and regional foods in U.S. consumer perceptions and preferences, but exploring these differences has not been the focus of their investigations (Hu et al., 2012; Onozaka et al., 2010).

The concept of “regional food systems or networks,”³ on the other hand, encompasses a system in which food production, processing, retail, and consumption are regionally organized and recognized as such by the actors involved. They may include regional foods such as the aforementioned GI specialty foods, but also other forms of produce, dairy and meat products, and even commodities (Kneafsey, 2010). The regional food-systems approach advocated by Ruhf & Clancy (2010) embodies such principles. So does the “agriculture of the middle” framework, which aims

to strengthen the vitality of midsize farms and, in some conceptualizations, midsize distributors and retailers in order to scale-up and increase consumer food access through food-system value chains (Clark & Inwood, 2016; Kirschenmann, Stevenson, Buttel, Lyson, & Duffy, 2008). Figure 1 displays a way to characterize the different intersecting scales of the food system and how they relate to one another.

Some of the basis for uncertainty and confusion about regional food may arise from the array of terms that have come into use in food system analyses. For example, some scholars use the term “foodshed,” defined first by Hedden (1929) but brought to attention more recently by Kloppenburg, Hendrickson, and Stevenson (1996), who used it interchangeably with “region.” This is particularly common in analyses of the potential of metropolitan regions to feed themselves (Horst & Gaolach, 2014; Kremer & Schreuder, 2012; Peters et al., 2008). However, others note that the foodshed concept has limited recognition by the broader public (Ruhf & Clancy, 2010), and is used inaccurately in some cases. In addition, there is no consensus about what constitutes a foodshed, which makes it a difficult construct to implement.

An alternative concept, “bioregionalism,” has arisen as a practical means to plan and design sustainable and resilient food systems. Unlike food-sheds, bioregions take into account the cultural identity of a place as well as its geography and its flora and fauna. For their project focused on southwest British Columbia, Harris and his colleagues employed a bioregional approach, which includes such landscape and social features as “terrestrial, marine, islands, watersheds, ecoregions, geopolitical boundaries, transport routes, and culture” (Harris et al., 2016, p. 12). Comparable to the fluidity of the regional construct, bioregions supersede fixed boundaries; the concept tends to necessitate experts consulting with community members to better understand what connects them to the food and agricultural landscape (Harris et al., 2016).

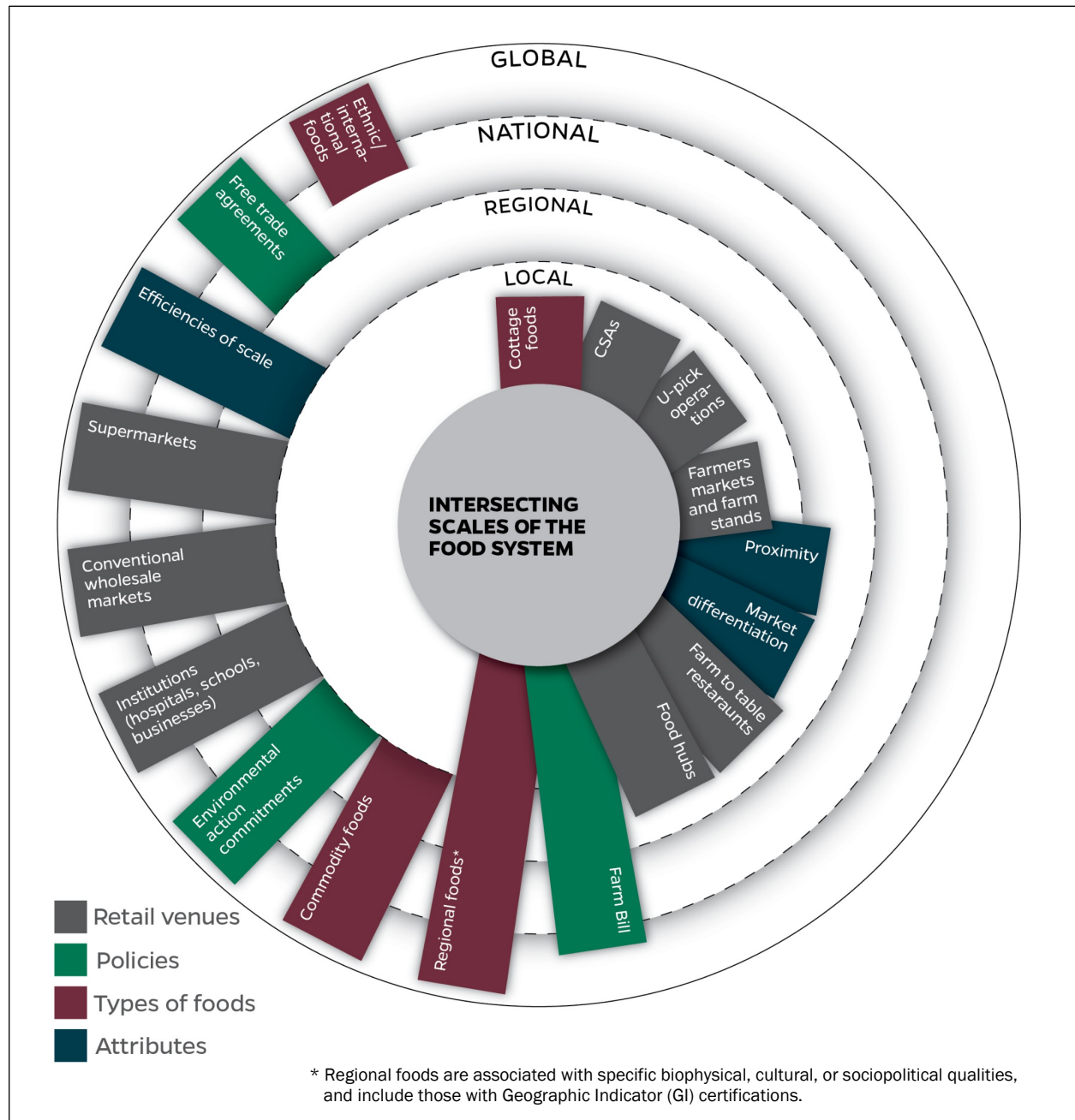
Scholars have employed different theories to investigate the diverse understandings and complexities of the definitions involving “local,” “regional foods,” and “regional food systems.” Consumer perceptions of regional foods, and

² This occurs despite the fact that the definition of GI that they cite from U.S. trademark law uses the term “regional” rather than “local.”

³ Initially, “systems” was more prevalent in American/Canadian terminology, whereas “networks” predominated in Western European agri-food literature (Hinrichs & Charles, 2012); however, these distinctions have softened in the 2010s.

Figure 1. Visualizing Different Scales of the Food System

Retail venues, attributes, policies, and types of food are identified with the scale of the food system with which they are most closely associated. For instance, while some supermarkets sell “local” food, they are most likely selling food within a radius more typically defined as their region (and are generally operating through regional wholesalers, not through direct farm-to-supermarket interactions). Meanwhile, while free-trade agreements influence local-level policies, they concentrate on national and international supply chains.



especially those differentiated through GI qualifications, are often analyzed through convention theory. Convention theory explores how partici-

pants coordinate their economic, political, and social behaviors around common principles and qualities (e.g., market, industrial, civic, fame,

domestic, inspired, environmental) rather than having their actions imposed upon them by a sweeping social order, a theoretical framework that is common in political economy approaches (Morgan, Marsden, & Murdoch, 2006; Ponte, 2016).

Meanwhile, the dynamic and sometimes contentious⁴ process of socially constructing scales to define “local” and “regional” food systems and their attributes echoes many concepts from “relational theories of place” (Sonnino, Marsden, & Moragues-Faus, 2016). These emerging theories within larger social and geography theory assert the fluid, overlapping nature of regions, less territorially bound than the construct of regions evoked by conventional political and administrative jurisdictions (Amin, 2004; Jones, 2009; Massey, 2005). While the proximity associations of “local” are distinct from the more socio-environmental specificities of “place” (Hinrichs, 2016) and thus these are not directly comparable, discussions about defining “regional food systems” may benefit from engaging with the theories that explore similar dynamics in other fields.

Whatever proven and potential benefits follow from a focus on regional food systems, the popularity of local food surely begs the question as to the potential role for consumers in driving demand for any food system change. Does the public have a role in influencing demand for regionally produced food? If so, what information on product origin would influence consumer purchasing decisions? We know that regionally produced food is already present in regional supply chains (Clancy et al., 2017); is there any value in differentiating it from other food currently available, including “local” food? How can our knowledge about consumer expectations regarding local food inform our understanding of regional food attributes and governance (Mount, 2012)? And last, what do other stakeholders, such as distributors, producers, retailers, and policymakers, need to know about

regional food to support the necessary infrastructure investments to elevate its profile? The fundamentally spatial questions explored in this paper have important implications for improving communication about food system (re)regionalization among policymakers and other stakeholders and for clarifying promising interventions.

Methods

The EFSNE project included two rounds of focus groups that broadly assessed community members’ thoughts and experiences related to food in their communities. The focus group objective was to discuss community perspectives on purchasing and consumption issues that covered the scope of the project; thus, results on regional themes were limited. To augment that work, additional qualitative data were collected with 51 participants from September to December 2013 in Baltimore, Maryland [referred to as SE Balt ($n=7$) and SW Balt ($n=7$); Jamaica Plain, Massachusetts [JP ($n=12$); Harrington [DE-Harr ($n=11$)] and Milford, Delaware [DE-Mil ($n=3$); and Winooski [VT 1 ($n=3$)] and Burlington, Vermont [VT 2 ($n=8$)]. In these seven supplemental focus groups, all but one of which were conducted in study sites that were also part of the larger EFSNE project, we sought to explore how the public thinks about regions in general as well as regional themes specifically related to food. The supplemental focus group discussions were inspired by the EFSNE project, but separately funded and conducted with staff support from EFSNE researchers using the EFSNE budget. Because several study sites in the EFSNE project have significant immigrant populations, three of the supplemental focus groups were composed entirely of immigrants, which were set up as part of the screening process to recruit participants.

We designed the discussion guide for the supplemental focus groups to elicit instinctive, unprompted reaction to the concept of region and participants’ connection to it. Participants were also asked about the extent to which they cared about the source of their food, the region with which they identified, and the ways they felt connected to their region. To contextualize their opinions about local and regional food systems, we

⁴ DuPuis and Goodman (2005) argue that open, continuous, “reflexive,” and thus inherently political processes of defining the desired attributes associated with such scales are necessary to protect food system (local, in their article, but equally relevant to regional-level) reform initiatives from exclusivity and corporate co-optation, and instead to bring about the social justice and environmental outcomes they ostensibly espouse.

further explored participant perceptions of the global food system and their perceived agency to change the food system. Moderators then presented the notion of local foods as food sold through direct marketing efforts and/or foods grown in the same state in which they are sold (Martinez et al., 2010). Finally, moderators introduced the project definition of the Northeast region, the project goals, and what was meant specifically by local and regional food systems, in order to ascertain participants' perceived benefits and drawbacks of local and regional.

In addition to the focus groups, we also included results from one question (only included in Year Four) on the EFSNE customer store intercept-survey that explored consumer food sourcing preferences, differentiating among local, state, and regional scales. The survey also collected information on consumers' perceived barriers to purchasing healthy foods, their shopping habits, and their demographic characteristics (methods described in Bonanno, Chenarides, & Lee, 2015).

Participants

The focus group sample consisted of 51 adult participants from seven focus groups. Unless otherwise noted, quotes throughout the manuscript reflect one participant's observations. Participants were recruited through contacts at community organizations, flyers, and word of mouth. One focus group ($n=7$) was conducted in Spanish and then transcribed into English. Otherwise, focus groups were conducted in English. Participant ages ranged from 25 to 93 years, and the mean age was 55 years. Seventy-eight percent of participants were female, and 37 percent of participants lived in households with children. Thirty-two percent of participants had completed elementary school or some high school; 28 percent completed high school; 22 percent completed some college or received a vocational or technical degree; and 18 percent received a four-year college degree. Thirty-two percent of the participants reported having some form of diet-related chronic disease, and 57 percent participated in federal food or nutrition assistance program.

One thousand and sixty-one (1,061) shoppers were included in the analysis of the store intercept-

surveys for the question related to food provenance. The average age and years of education for the sample were 48 years and 13.25 years, respectively. Approximately 64 percent of respondents were female, and 38 percent of the respondents' households had children below five years of age. Approximately 43 percent participated in a federal food assistance program (SNAP, WIC, etc.). The respondents shopped, on average, 4.65 times per month and spent an average of approximately US\$268 on food purchases at the store per month. Sixty percent of them shopped at farmers markets, and approximately 19 percent lived in rural EFSNE locations (methods described in Bonanno, Chenarides, & Lee, 2015).

Data Collection

EFSNE project staff moderated the focus group discussions, which averaged one hour in length and were conducted in private rooms at local community centers, organizations, or schools. Focus group guides were used to introduce topics, and probes were employed to obtain detail and stimulate discussion. Focus group participants completed demographic questionnaires that assessed personal characteristics and household composition. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved the study.

Exit survey data were collected during face-to-face interviews with shoppers exiting a store after completing their purchases at stores participating in the EFSNE project.

Analysis

Focus group discussions were digitally recorded and transcribed. Thematic analysis, in which transcripts were examined for patterns, was then performed using HyperRESEARCH (Braun & Clarke, 2006). To begin the process, a team of four of the authors reads all transcripts to familiarize themselves with the data. An initial codebook was developed based on topics from the focus group guide. (This paper is also organized according to these topics.) Each transcript was double-coded, then authors developed specific sub-codes. We then met in pairs and as a team to reach consensus on the final codebook. Finally, each transcript was

re-coded using the final codebook, before the team met again to reach consensus on all final codes. The data for the store intercept-surveys were analyzed with Microsoft Excel and STATA version 13.

Results

Situating Regional

To explore participant spatial understanding of their region and their connection to it, they were asked to identify their region and how they felt connected to it. Participants mentioned geographic regions such as East Coast, New England, and Mid-Atlantic; configurations of contiguous states such as Delmarva (Delaware/Maryland/Virginia) and Jersey/Delaware; and bioregions such as the Chesapeake. These responses resembled the findings for the EFSNE core focus groups conducted in 2014. Participants in multiple focus groups identified their region as the state in which they resided or a region within that state, such as the Eastern Shore of Maryland and the Northeast Kingdom of Vermont. One participant (SW Balt) noted, “They [people you meet] would ask ‘Where are you from?’ not ‘What region are you from?’,” an observation confirming that “region” is not a regular conversational construct. Perhaps due to their experiences of having lived in a variety of places and moving across and engaging with multiple geographical scales, most immigrant participants gave their home country of origin first and then provided a response that included regions within the greater regions in the U.S., such as New England or the Mid-Atlantic. Thus, there were similarities but also a lack of consensus about what constituted a region.

Food and foodways factored prominently in what people associated with their personally

defined region, as well as a specific climate and cultural, social, and recreational activities such as skiing, skating, fishing, boating, and festivals. Not surprisingly, seafood, particularly crabs, was mentioned a few times, as were milk, cheese, blueberries, apples, and watermelon. Participants in the EFSNE project core focus groups also associated certain produced and processed foods [e.g., cheese-steak, crabs, ramps (a type of onion), pepperoni rolls, apples] with their region. For some, states were associated with specific products: “...if you know anything about the Northeast, you know what is grown in each state” (SW Balt).

Focus groups with immigrants included more discussion about their ability to sustain native foodways in the U.S. One participant noted that she was pleased that produce that was available in her country was also available in the U.S. during the growing season, and looked forward to getting it from her country when the climate was too cold for growing it in the U.S. (SE Balt). Another immigrant explained that community connections helped retain his food culture: “We are still living together as a community, and we meet people from our own background a lot, and we have been able to maintain that, also our food habits and other living practices” (VT1).

The lack of a strong, definitive regional food system identity or preference, especially in comparison to local foods, was also reflected by consumers surveyed in the store survey component of the EFSNE project. Using data from intercept-surveys conducted at the study stores, we inquired about the importance of from where food comes. Of those who indicated that to them where food comes from is very or somewhat important, we asked which geographic scale was most important to them (Table 1). Notably—perhaps given their

Table 1. Shopper Preference of From Where Food is Sourced

	Within 100 miles (161 km)	Within the state	Within state and neighboring state	Entire Northeast	Other
Rural	28%	29%	19%	14%	9%
Non-rural	36%**	26%	8%	12%*	18%**
Total	34%	27%	10%	13%	16%

* Statistically different at the 1% significance level. ** Statistically different at the 5% significance level

relatively larger geographical experiences—rural shoppers had a larger radius of preference and were more likely to indicate preference for regional over local food sourcing compared to non-rural shoppers.

Perceived Benefits and Drawbacks of Supporting Local and Regionally Produced Food

To avoid conflating local and regional foods in the focus groups, the researchers provided a paragraph explaining the EFSNE project and the specific 12-state geography (and the District of Columbia) that was used to configure the Northeast region for the project. Even with this deliberate prompt, it was difficult to determine if the regional construct was viewed as distinct from local. (This ambiguity was similar to what occurred with EFSNE core focus groups.) Most people answered using familiar local-food attributes such as higher quality, fresher quality, more local economic impact, and lower transportation costs. When prompted, a few mentioned the word region; however, even then, participants (and occasionally facilitators) still mostly discussed local food system features such as farmers markets, farm stands, and homegrown foods.

Economy

Supporting the local and regional economy (i.e., circulating money in the region, supporting local farmers/neighbors, and providing jobs) was reported as an important reason to purchase local and regional foods by many of the focus group participants. As one participant stated, “To support the people that grow these foods, so that they make some money as well. Because if they are coming all the way here to sell the food. Then we go there because it is good quality and fresh but also to support them” (JP). While there was no distinction in responses between local and regional for this question, some participants extrapolated economic benefits beyond helping the producer: “If we use products produced by farmers in this region, then the money is going to stay in this region, right?” (SE Balt). Such logic replicates the common assertion that local food helps to keep dollars within the local community.

Quality

While a few people expressed skepticism about whether the quality of local and regional foods was better, most participants discussed how local and regional foods are fresher and taste better than those shipped from across the country or overseas. Some noted that they believe these foods are healthier too, because of the higher number of nutrients, fewer preservatives, and fewer chemicals and/or contaminants. One participant noted: “...Yes, when they are from the region they are healthier because they have less chemicals and contaminants for your health” (JP).

Some immigrants noted that in their home countries (Bhutan and Mexico), they may have shopped daily and eaten more local food, if not actually grown in their own garden or home, that was picked immediately before cooking and/or serving and was of fresher quality. At least two immigrants mentioned that purchasing directly from local farms is common practice in their countries (SE Balt and VT1). In the core EFSNE focus groups, immigrants also mentioned the importance of accessing fresh and high-quality meat and prepared foods such as tortillas. They also stressed freshness, taste, and fewer contaminants as features of local and regional food.

Price

Participants diverged in their opinions comparing the prices of local and regional foods with food not identified as such. Most responses focused on the contrast between purchasing at a direct-market venue (e.g., farmers markets) and a traditional retail outlet (e.g., supermarkets), rather than responding to the regional-scale prompt. Some felt that it was logical for local foods to be less expensive: “It should also be cheaper, because you don’t have to pay as much for trucking and all that” (DE-Harr). In SE Baltimore, many participants expressed similar views: “I wait until there is a farmers market until on Tuesday, because of the freshness and the prices, like I said [it] is more economical.” Other participants in that focus group referenced this notion that farmers markets were cheaper, especially in comparison to supermarkets, which they felt changed their prices too often and offered poorer quality.

On the other hand, most participants commented that local and regional foods were not cheaper. A participant stated: “No, [it] is not cheaper but [it] is worth it” and “Once a year it’s good. Once a year won’t hurt you”⁵ (JP). Another woman expressed exasperation, “You try to buy locally, and it’s up the roof, and you can’t” (VT2). Others in that group also stated that the only reason they bought local foods was because of coupons offered.⁶ Without the coupons, they felt the food was too expensive for them. One participant also noted that people place a higher value on local food: “So what I’ve discovered is that people from our communities here are willing to pay... two or three times more if they get local chicken” (VT1).

Given that cost was the most cited challenge in accessing healthy food in the core EFSNE focus groups, this deliberation about the price of local and regional foods was expected. Some conversations became more nuanced, as participants tried to figure out why local and regional foods would be more expensive, given the expectation that shorter transportation distances should lead to lower costs. One participant suggested that there would be additional labor costs associated with more locally harvested fruits and vegetables compared to harvesting commodity crops (VT2). Another woman described economies of scale and that restricting products to a regional market would cost more because companies could not have bigger markets (DE-Mil).

Variety and Availability

Many participants accurately noted that the Northeast region is limited in what can be grown, both in types of foods (e.g., citrus fruits, ethnic foods, and coffee) and in growing season. Both California and Florida were mentioned, in jest, as regions where participants wanted to live so as to access what they offer. Participants also expressed appreciation of global supply chains that provided

access to a wider variety of foods—especially culturally important foods—and to some produce that would otherwise only be available during the shorter growing season in the U.S. Others expressed concern that food needs to be imported, given U.S. capacity constraints.

In relation to variety and availability, a few participants discussed resiliency concerns such as farmland preservation, fuel costs, weather fluctuation, and carbon footprint. One person noted the importance of supporting local farmers and the economy to ensure that farmland is not lost and therefore unable to produce food (JP). Another participant described how certain products such as strawberries must come from different parts of the country to be available year-round. She was willing to be “more tolerant of that huge carbon footprint,” especially for pleasures like eating chocolate-covered strawberries on Valentine’s Day (DE-Mil). Her comment thus circles back to the previous discussions about seasonal availability.

In two of the immigrant groups (JP and VT1), participants acknowledged that there would never be enough food grown to feed the entire state: “I think [Vermont] is a state in which we have to resign yourself with what you get because here you can’t harvest anything; then we have to accept everything that comes from other places... Whatever is harvested here in the farms during the summer is not enough to last until the next summer” (VT1). While most proponents of regional food systems do not posit regional self-sufficiency as the goal, these focus group conversations suggest the need to reinforce this point emphatically to preempt such concerns.

Social

Perhaps due to the predominance of direct marketing, participants frequently mentioned the assumed social attributes of local, but not regional foods. One woman stated after being prompted about benefits of purchasing *regional* foods: “And there’s just a feel-good aspect. You know, if you can go to a farmers market and talk to the person who’s actually raising the crop, it gives you a connection to your food that you can’t get at Wal-Mart...” (DE-Mil). Some mentioned traditions and memories of going to a farmers market, roadside stand,

⁵ “Una vez al año no hace daño” is a popular saying in Spanish-speaking countries.

⁶ They were referring to nutrition incentive coupons, which double the value of Supplementary Nutrition Assistance Benefits (also known as “food stamps”).

or U-pick farm with their family, in childhood or with their children and grandchildren now. However, the regional connection to social attributes was not entirely absent from the discussions. One man discussed how Perdue had supported farmers in the Delmarva Peninsula by committing to purchasing all the grains the peninsula grows (DE-Harr). Some in Harrington also brought up the marketing slogans used to influence consumer perceptions of the value of the local and regional food economy.

Perceptions of Global Food System

Two themes were most prominent in discussions of the global food system: the safety of imported foods, and the need or lack of imported foods to enhance supply and variety. With both themes, there were expressions of disagreement and uncertainty. There were also conspicuous differences across groups; the dissimilarities and similarities between immigrants and U.S.-born individuals were most notable.

In general, the debate about the safety of imported foods related to the thoroughness of U.S. inspections. Some participants suggested that inspections are adequate to protect consumer safety; for example, : “A lot of our vegetables come from Chile, and that is highly controlled by this country” (DE-Harr). Other participants, however, voiced concerns about imported foods due to the poor quality of inspections: “They need to do more better inspection because there’s a lot of stuff that they import here, they be recalling a lot” (SW Balt).

Some conversations about the safety of imported food readily moved into discussion about the safety of domestically produced foods. One interesting but unusual remark reflected worries about the safety of foods grown in the United States: “But in the last few years, finding out what I do about how our food is grown and handled, it might be safer to buy imported foods than food that’s raised right on my farm” (DE-Mil). On the other hand, several participants expressed confidence in the U.S. food supply as a whole, including domestically produced and imported foods, particularly relative to other countries; notably, a Nepali man appreciated the food hygiene practices in the U.S. compared to his home country (VT1).

Another topic of conversation was the food variety and supply possible because of imported foods. Several participants stated their preference for U.S.-grown foods: “If those food items can be grown here, that would be much better”(VT1). At least one participant questioned the need for imported foods at all: “I think the United States has enough resources here that we don’t have to go out of the country to get our food. You know what I’m saying?” (SW Balt). Despite those statements, most people noted that origin of their food was not important to them and did not factor into their shopping decisions.

On the other hand, some participants—particularly immigrants—indicated that imported foods were sometimes necessary (JP: “Not all the things we need are grown here [in the United States]”) or desired. The appeal of foods from participants’ countries of origin was particularly strong (JP: “The products that we consume from other countries help the country that sells the product to progress”). In DE-Harr, participants remarked on the importance of global markets not just as a source of supply, but as a resource of demand, as when international markets can move a U.S.-produced product (e.g., chicken feet) for which there is not enough domestic demand. This notion of market interdependency was mentioned in another immigrant group as well: “You can find food from this country in my home country and foods from my home country here” (SE Balt).

Ability to Influence Food Systems

Although regional food systems were the focus of this study, we were also interested in participants’ sense of efficacy and engagement with food. Participants were asked if they thought they could influence community-level food systems by working with their neighbors. Participants discussed as well their ability to have an influence on markets as consumers. The perspectives varied for both themes; however, most participants indicated that they perceived themselves as having a greater influence on neighbors than on businesses.

When asked about whether they felt that they had a voice in where their food comes from, most participants connected the economic principle of supply and demand to their ability to influence the

food system. One person stated: “Supermarkets didn’t sell Hispanic foods before and now you see that they sell yucca root, sweet potatoes, and those things; why? Because people asked for it” (JP). One participant remarked that demand affects producer decisions as well: “If we stop buying the products they grow, they won’t want to plant for next year (SW Balt).”

Other participants doubted the influence of consumers acting individually, but they allowed for the possibility of collective change. In two focus groups (JP and SE Balt), participants made the connection that by purchasing food from their native countries, they were supporting the growers in their country of origin and ethnic food stores in their communities. In addition, they were sharing their food cultures with their neighbors.

Nevertheless, most participants conveyed the view that consumers have little influence. One participant noted, “I think we have influence, but we don’t know how to use it on the owners of supermarkets. Because they are always going to get whatever is cheaper. They will buy in wholesale from a state where their products are at a lower price” (SW Balt). Another implied that national retailers are unlikely to consider a consumer perspective: “Think about Safeway. Think about Walmart. Think about Sam’s Club. Where do they get their food from? Collectively, yeah, we might have a say in it, but they get their food from whomever they want to get it from” (SW Balt).

A few participants mentioned the absence of labels that would identify state or regional products, and their consequential disinclination to make point of origin a criterion for purchasing foods (DE-Mil, SW Balt). That said, even when that information was clearly available in the context of direct marketing initiatives—and participants stated that they enjoyed purchasing from farmers markets and other local venues—most acknowledged that they were not using origin as a filter in deciding what food to purchase. In contrast, participants did report using labels to determine freshness and expiration dates, of particular concern in low-income neighborhoods where produce quality was perceived to be lower than in food stores in higher-income neighborhoods.

Regarding ability to influence neighbors, most

participants were more optimistic. They affirmed the impacts of sharing knowledge, role-modeling the practice of gardening, and sharing foods and foodways. One immigrant participant from a South American country recounted that she invited her neighbor, an American, to one of her parties, and the neighbor became fond of pico de gallo (SE Balt).

Discussion

Inviting people to describe their perceptions about their regions, with an emphasis on regional and local food systems, yielded a variety of opinions and ideas. When we organized our findings thematically, we found that, as we anticipated, the concept of regional—especially compared to local, national, and global scales—is difficult for many people to explain and understand, and that people have conflicting views about the attributes of local and regional food systems, and the food system in general. We also found that, beyond our initial expectations, immigrants frequently articulated more nuanced perspectives on the different scales of the food system than non-immigrants.

At least within the project focus area, the Northeast U.S., the concept of region appears to be largely absent from the discourse of our study participants, while geopolitical boundaries provide a concrete frame of reference. As in the existing literature, participants discussed various scales in their notion of regional: multistate (“The region includes the five states that are right next to us” JP), state, multicounty (“Eastern Shore” DE-Harr), county (“Sussex County” DE-Mil), and bioregions (“We’re more or less considered New Englanders” VT2).

The lack of regional identity in the Northeast may be a result of the shifting nature of what is defined as the Northeast. Our project (and the USDA) defined the Northeast as the 12 states from Maine to West Virginia, plus the District of Columbia. While New England is considered part of the Northeast, and always includes the same set of states, the Mid-Atlantic, also part of the Northeast, is more ambiguous. The U.S. Census Bureau considers the Mid-Atlantic to encompass NY, PA, and NJ (U.S. Department of Commerce, n.d.), whereas the U.S. Geological Survey references it as

MD, DE, VA, WV, and parts of PA, NY, NJ, and NC that border the Chesapeake Bay (Greene, LaMotte, Cullinan, & Smith, 2005). The USDA divides the country into larger regions, and even those are mutable depending upon the governmental program. The fluidity of regions is an acknowledged feature in regional food system frameworks and should be considered an asset, but may also lead to some confusion about definitions.

When participants were prompted to discuss how they perceived potential benefits and drawbacks of supporting their regional food system, local and regional were frequently conflated. For instance, participants immediately jumped to discussing the attributes of farmers markets, farm stands and other direct-to-consumer supply chains—and then considered what these activities translated to at regional scale. In addition, people articulated local attributes easily; however, they also acknowledged their confusion about what constitutes a “local product.” For instance, some considered local foods to be only those from hyper-local areas (i.e., within a radius smaller than their state) while others considered the local scale to include foods from a much larger distance or scale. This echoes the typical conflation of the two scales in both academic (Kneafsey, 2010) and grey (Low et al., 2015) literature. The global scale for food, on the other hand, was viewed favorably for variety and availability benefitting consumers but less favorably when the discussion turned to production methods, trade relations, and food safety.

Responses about attributes of different scales of the food system also revealed several misperceptions about the food system overall, such as lack of understanding about food safety procedures, production methods, and labeling. These results also were affirmed in the EFSNE project’s core focus groups. This confusion and lack of transparency may help explain some of the overall distrust expressed of various actors within the food system such as retailers and government agencies.

Certain demographic groups responded to the concept of regional food systems with more ease and acceptance. For instance, the immigrant focus groups more easily situated themselves in a larger geographic region, perhaps due to the more global nature of their life experiences. By relocating to a

new country, they may have a more firsthand perspective of how different geographical scales affect economic and social experiences. This may make them more attuned to possible distinctions between global, national, regional, and local supply chains. In one focus group (VT1), participants discussed opportunities for participating in food production themselves, raising animals and selling vegetables. Others mentioned purchasing food daily due to the growers’ markets available to them when they lived in their home countries. Coming from countries with strong agrarian traditions may account for such perspectives. Meanwhile, rural consumers responding to the EFSNE store intercept-surveys indicated a greater preference for foods sourced from larger distances—within their state, state and neighboring states, and the Northeast—than their urban counterparts. This could be due to the nature of rural life, which necessitates traveling greater distances and perhaps makes them more attuned to the limitations of sourcing foods within a 100-mile (161-km) radius.

Opportunities

In the absence of robust empirical evidence on the importance of the regional scale, we outline several opportunities for strengthening the regional food system: increasing processing and value-added production, enhancing awareness of regional products, investing in infrastructure, and promoting agricultural models that link scales of production.

In these focus groups as well as in the core EFSNE focus groups, participants discussed constraints on eating regionally and seasonally but focused almost entirely on fresh foods. Limiting the conversation to fresh foods negates the role of processing foods grown in the region, which can be a viable means of supporting a larger regional food economy (Clancy et al., 2017). In addition, the EFSNE project found that many businesses involved in food processing and storage are in peri-urban centers. In Baltimore, for example, 61 percent of food processing and 75 percent of food storage businesses are in peri-urban zones (Saber, 2016). These provide commerce and employment opportunities for the densely populated urban centers, and potentially another rationale for supporting the regional food system. Nevertheless,

regionally grown or processed products are typically not distinguished or labeled by producers and processors and hence not recognized by shoppers as regional.

In fact, regional sourcing of both fresh and processed foods is already happening throughout the Northeast (Clancy et al., 2017) but not marketed in any uniform or well-recognized fashion to shoppers, especially compared to the emphasis on GI food products in Europe. While there may not be a need to devote significant resources to developing a regional food campaign identity, there may be many opportunities to increase consumer awareness of specific foods produced in northeastern regions, similar to the way that the rapid expansion of farmers markets has made local food suppliers visible (Gillespie, Hilchey, Hinrichs, & Feenstra, 2007). Northeastern foods, many of which are sold on a large scale and at affordable prices through conventional supply chains, include lima beans from Delaware, mushrooms from Kennett Square, PA, cranberries from Cape Cod, MA, potatoes from Aroostook, ME, Concord grapes from Western NY and PA, and blueberries from Hammonton, NJ (Hilchey, 2008). Efforts to enhance awareness may be informed by the work of scholars who have begun to explore how to market regional products in other regions of the U.S. (Hu et al., 2012). Producers, producer cooperatives, distributors, and other intermediary stakeholders in the supply chain may all benefit from cleverly marketed consumer education efforts.

In addition, this proposed shift to support more regional food production would benefit from investment in infrastructure and value-added facilities, documentation of the value of regional food production, and development of better understanding of the supply chains operating within regions. Models such as small-scale grower cooperatives and food hubs that currently organize on a relatively local scale could benefit from collaborating with other cooperatives in a region through jointly pursuing infrastructure investment in value-added processing, marketing regionally produced products, developing more joint education and organizational development training opportunities, and even allying with cooperatives in different regions and climates in order to maximize product

variety (Hilchey, Gillespie, & Henahan, 2006).

A large region with states that vary in size and population also presents opportunities for sharing infrastructure, distribution routes, environmental action commitments, and even social justice aspirations. For instance, large purchasers such as schools, hospitals, universities, and other institutions in the region could collaborate—as the Farm to Institution New England network does—to invest in important processing and transportation infrastructure, or to ask for similar environmental and social justice practices from their regional suppliers (e.g., through commitments pursued by the Real Food Challenge, Health Care Without Harm, and Center for Good Food Purchasing, all of which have region-specific staff organizers). Regional producers could also align themselves around social justice values to combat inequities of the national and global food system, such as the Federation of Southern Cooperatives explicitly pursuing economic, land, and housing justice for Black, Hispanic, Native American, and women farmers and ranchers (Zippert, 2014). Exploiting these opportunities through the adoption of a regional food-system framework may better supply the food needs of region inhabitants while also optimizing natural resource sustainability, land use planning, scale, economic development, biodiversity (Ruhf & Clancy, 2010) and adaptation to climate change (Harris, Nixon, Newman, & Mullinix, 2016).

While some of the participants in our focus groups seemed to understand the importance of the attributes of regional such as resiliency, there may not be enough comprehension yet to build a market. The more important audiences to promote and seek support for regionally produced and/or processed foods may be other actors in the food system. For instance, policymakers can allocate resources for infrastructure, growers and producers can aggregate products, distributors can optimize transportation routes, and academics can contribute with targeted, system-wide investigations such as the EFSNE project. Getting buy-in from these regional stakeholders promoting the value of regional supply chains will be necessary before any large-scale consumer education effort can be undertaken.

Conclusions

The concept of region has not been adopted by food-system stakeholders, particularly in relation to food supply/provisioning chains, to the extent that regional approaches have been embraced in other sectors such as planning, community development, and natural resource management (McKinney & Johnson, 2009). These potential benefits of a regional focus are increasingly important as we grapple with impending threats—i.e., the impact of climate change on crop yields, declining water availability, and extreme events (Thornton, Erickson, Herrero, & Challinor, 2014)—which could be optimally addressed at a regional scale.

As the field of regional food systems, including efforts such as the Agriculture of the Middle initiative, continues to evolve, the evidence base supporting this work would benefit from an influx of resources. Midsize producers, particularly those practicing sustainable farming methods, may benefit from product differentiation; access to regional distributors, markets, and value chains; and overall regional efficiencies (Clark & Inwood, 2016). Given any region's production limitations, regional food-system frameworks involve increasing the amount of food grown, processed, procured and consumed in a region to enhance regional self-reliance; they do not aim to create a fully self-sufficient region.

The results of this study revealed that selling the claims of regional food at the consumer level at this time might be premature for several reasons. First, the concept of regional compared to local food systems is ambiguous and amorphous. Without a clear sense of (or a strong evidence base to support) the unique benefits of regional food systems, it will be difficult to convey to consumers the regional food-system framework. Second, consumers may not actually be the most effective stakeholders to convert initially. As studies have shown, retailers and consumers do not define local food in the same way (Eriksen, 2013), so consumer demand does not necessarily translate into those products on store shelves. The fluidity of the regional scale, without a differentiated supply chain, would make demand similarly difficult to supply. Furthermore, our participants suggested that regional origin may not sway purchasing tendencies,

given all that they consider when they are shopping. This type of food labeling demands significant consumer education and motivation to change purchasing patterns, as Grunert et al. (2014) found when examining sustainability labeling. Any marketing effort would need to be accompanied by a critical mass of regional supply chains, with clear communication about the benefits of regional food. Having stated this, some stores in the industry have been using the regional descriptor on in-store produce point-of-sale labels. This shift is in response to the co-opting of “local” by food marketers, which has led to consumers’ skepticism that foods labeled local are really local (i.e., sourced from within their state or within 100–200 miles or 161–322 km). Retailers have begun using the term “regional” to more transparently classify foods that are clearly beyond what consumers would think is local, but at least still support their regional economy. Seasonality also plays a role in what consumers define as “local” throughout the year (R. Stein, VP of Fresh Foods, Food Marketing Institute, personal communication, Nov. 28, 2017).

Other stakeholder groups could be more appropriate audiences for supporting the regional food system, especially as consumption patterns are also limited by the types of foods and purchasing opportunities available. Thus, changing whole systems of food provisioning at institutional levels may be more effective than targeting individuals through labeling schemes (Barnett, Clarke, Cloke, & Malpass, 2005). For instance, due to increasing public interest, many schools, universities, hospitals, and governments have begun reforming their food procurement practices to support nearby producers and provide healthy, ecologically sustainable, fair, and humanely raised food. With their steady and significant demand, institutions are in an excellent position to support and expand regional food systems while helping build the evidence base for regional food sourcing (Fitch & Santo, 2016). Meanwhile, regional food-system distribution and retail opportunities are greatest with mid-sized distribution and retail firms (Clark & Inwood, 2016).

Future research could explore how other actors in the food chain, such as producers, distributors, retailers, and institutional procurement

decision-makers who may have more power to influence and change supply chains, respond to the regional food system framework. Additionally, while some of the posited attributes—e.g., capacity to supply a larger proportion of demand while fostering natural resource sustainability, economic development, and diversity—of regional food system frameworks have been explored, further research to provide concrete evidence of its impacts is merited (Clancy et al., 2017).

This study is one of the first to attempt to differentiate consumer perceptions of regional and local food systems. Incorporating immigrant focus groups provided the analysis with a rich and unique perspective. Our study has also benefited from the collective learning that occurred with the EFSNE project over seven years among students, colleagues, store owners, and community leaders across the nine sites, eight universities, and USDA Agricultural Research Service (ARS) and Economic Research Service (ERS) staff.

This study has several limitations. As a qualitative investigation, the focus group results are not

statistically generalizable and only represent the discussions we facilitated in these locations; however, the focus groups enabled us to explore participants' diverse perceptions of regional food systems. The store intercept-survey also illuminates some of the qualitative findings. We limited our study to the U.S. Northeast, which may have regional characteristics (e.g., the small size of many of the states and their close proximity) that further limit applicability of these findings to other regions. Furthermore, regional food-system thinking remains a work in progress. Despite our careful intentions and deliberate research inquiry, even we still succumbed at times to the conflation of local and regional. This paper, we hope, has succeeded in clarifying these concepts in ways that can and will support regional work on food systems throughout the Northeast U.S. and beyond.

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References

- Adams, D. C., & Salois, M. J. (2010). Local versus organic: A turn in consumer preferences and willingness-to-pay. *Renewable Agriculture and Food Systems*, 25(4), 331-341. <http://dx.doi.org/10.1017/S1742170510000219>
- Amin, A. (2004). Regions unbound: Towards a new politics of place. *Geografiska annaler: Series B, Human Geography*, 86(1), 33-44. <http://dx.doi.org/10.1111/j.0435-3684.2004.00152.x>
- Barham, E. (2003). Translating terroir: The global challenge of French AOC labeling. *Journal of Rural Studies*, 19(1), 127-138. [http://dx.doi.org/10.1016/S0743-0167\(02\)00052-9](http://dx.doi.org/10.1016/S0743-0167(02)00052-9)
- Barham, E., Bingen, J., & Hinrichs, C. C. (2011). Geographical indications in the United States. In E. Barham & B. Sylvander (Eds.), *Geographical indications for food: Local development, global recognition* (pp. 122-137). Oxford, UK: CABI.
- Barnett, C., Clarke, N., Cloke, P., & Malpass, A. (2005). The political ethics of consumerism: Citizenship between individualisation and participation. *Consumer Policy Review*, 15(2), 45-51. Retrieved from http://oro.open.ac.uk/7143/1/CPR_Paper.pdf
- Bonanno, A., Chenarides, L., & Lee, R. (2015, June). Assessing the healthfulness of food purchases among low-income area shoppers in the Northeast. Paper presented at the 2015 NAREA/CAES Joint Annual Meeting, Newport, RI.
- Born, B., & Purcell, M. (2006). Avoiding the local trap: Scale and food systems in planning research. *Journal of Planning Education and Research*, 26(2), 195-207. <http://dx.doi.org/10.1177/0739456X06291389>
- Bostrom, M. (2005). *Digesting public opinion: A meta-analysis of attitudes toward food, health and farms*. Washington, DC: Frameworks Institute. Retrieved from www.frameworksinstitute.org/assets/files/PDF_FoodSystems/food_systems_meta_analysis.pdf
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <http://dx.doi.org/10.1191/1478088706qp0630a>
- Clancy, K., Bonanno, A., Canning, P., Cleary, R., Conrad, Z., Fleisher, D., Gómez, M., Griffin, T., Lee, R., Kane, D., Palmer, A., Park, K., Peters, C., & Tichenor, N. (2017). Using a market basket to explore regional food systems. *Journal of Agriculture, Food Systems and Community Development*, 7(4), 163-178. <https://doi.org/10.5304/jafscd.2017.074.018>

- Clark, J. K., & Inwood, S. M. (2016). Scaling-up regional fruit and vegetable distribution: Potential for adaptive change in the food system. *Agriculture and Human Values*, 33(3), 503-519. <http://dx.doi.org/10.1007/s10460-015-9618-7>
- Darby, K., Batte, M. T., Ernst, S., & Roe, B. (2008). Decomposing local: A conjoint analysis of locally produced foods. *American Journal of Agricultural Economics*, 90(2), 476-486. <http://dx.doi.org/10.1111/j.1467-8276.2007.01111.x>
- Dumont, A., Davis, D., Wascalus, J., Wilson, T.C., Barham, J., & Tropp, D. (2017). *Harvesting opportunity: The power of regional food system investments to transform communities*. St. Louis, MO & Washington, DC: Federal Reserve Bank of St. Louis, Board of Governors of the Federal Reserve System. Retrieved from <https://www.stlouisfed.org/community-development/publications/harvesting-opportunity>
- DuPuis, E. M., & Goodman, D. (2005). Should we go “home” to eat?: Toward a reflexive politics of localism. *Journal of Rural Studies*, 21(3), 359-371. <http://dx.doi.org/10.1016/j.jrurstud.2005.05.011>
- Eriksen, S. N. (2013). Defining local food: Constructing a new taxonomy—three domains of proximity. *Acta Agriculturae Scandinavica, Section B—Soil & Plant Science*, 63(sup1), 47-55. <http://dx.doi.org/10.1080/09064710.2013.789123>
- Feldmann, C., & Hamm, U. (2015). Consumers’ perceptions and preferences for local food: A review. *Food Quality and Preference*, 40, 152-164. <http://dx.doi.org/10.1016/j.foodqual.2014.09.014>
- Fitch, C., & Santo, R. (2016). *Instituting change: An overview of institutional food procurement and recommendations for improvement* (Research Report). Baltimore, MD: Johns Hopkins Center for a Livable Future. Retrieved from https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/research/clf_publications/pub_rep_desc/instituting-change.html
- Gillespie, G., Hilchey, D., Hinrichs, C. & Feenstra, G. (2007). Farmers’ markets as keystones in rebuilding local and regional food systems. In C. Hinrichs & T. Lyson (Eds.), *Remaking the North American food system: Strategies for sustainability* (pp. 65–83). Lincoln, NE: University of Nebraska Press.
- Giovannucci, D., Barham, E., & Pirog, R. (2010). Defining and marketing “local” foods: Geographical indications for U.S. products. *The Journal of World Intellectual Property*, 13(2), 94-120. <http://dx.doi.org/10.1111/j.1747-1796.2009.00370.x>
- Greene, E. A., LaMotte, A. E., Cullinan, K., & Smith, E. R. (2005). *Ground-water vulnerability to nitrate contamination in the Mid-Atlantic region* (USGS Fact Sheet FS 2004-3067). Reston, VA: U.S. Geological Survey. Retrieved from <https://pubs.usgs.gov/fs/old.2004/3067/>
- Grunert, K. G., Hieke, S., & Wills, J. (2014). Sustainability labels on food products: Consumer motivation, understanding and use. *Food Policy*, 44, 177-189. <http://dx.doi.org/10.1016/j.foodpol.2013.12.001>
- Harris, G., Nixon, D., Newman, L., & Mullinix, K. (2016). Delineating the Southwest British Columbia bioregion for food system design and planning: A practical approach. *Journal of Agriculture, Food Systems, and Community Development*, 6(4), 71-86. <http://dx.doi.org/10.5304/jafscd.2016.064.010>
- Hedden, W. P. (1929). *How great cities are fed*. Boston, MA: D. C. Heath.
- Hilchey, D. (2008). “*Goût de terroir*: Exploring the boundaries of specialty agricultural landscapes.” In C. Goetcheus & E. MacDonald (Eds.), *Preserving the boundaries of historic landscape preservation* (pp. 56–71). Clemson, SC: Clemson University Digital Press.
- Hilchey, D., Gillespie, G., & Henahan, B. (2006). *Small-scale grower cooperatives in the Northeast United States: A study of organizational characteristics, manager, member and director attitudes, and the potential for improving regional inter-cooperative collaboration* (RBS Research Report 210). Washington, DC: U.S. Department of Agriculture Rural Development-Cooperative Programs. Retrieved from <http://www.rd.usda.gov/files/RR210.pdf>
- Hinrichs, C. (2016). Fixing food with ideas of “local” and “place.” *Journal of Environmental Studies and Sciences*, 6(4), 759-764. <http://dx.doi.org/10.1007/s13412-015-0266-4>
- Hinrichs, C., & Charles, L. (2012). Local food systems and networks in the US and the UK: Community development considerations for rural areas. In M. Shucksmith, D. L. Brown, S. Shortall, J. Vergunst & M. E. Warner (Eds.), *Rural Transformations and Rural Policies in the UK and US* (pp.156–176). New York & Abingdon, UK: Routledge, Taylor & Francis.
- Horst, M., & Gaolach, B. (2014). The potential of local food systems in North America: A review of foodshed analyses. *Renewable Agriculture and Food Systems*, 1-9. <http://dx.doi.org/10.1017/S1742170514000271>

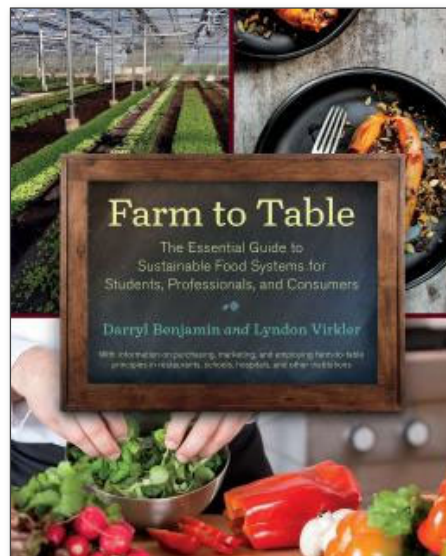
- Howard, P. H., & Allen, P. (2010). Beyond organic and fair trade? An analysis of ecolabel preferences in the United States. *Rural Sociology*, 75(2), 244-269. <http://dx.doi.org/10.1111/j.1549-0831.2009.00009.x>
- Hu, W., Batte, M. T., Woods, T., & Ernst, S. (2012). Consumer preferences for local production and other value-added label claims for a processed food product. *European Review of Agricultural Economics*, 39(3), 489-510. <http://dx.doi.org/10.1093/erae/jbr039>
- Ilbery, B., & Kneafsey, M. (2000). Registering regional specialty food and drink products in the United Kingdom: The case of PDOs and PGIs. *Area*, 32(3), 317-325. <http://dx.doi.org/10.1111/j.1475-4762.2000.tb00144.x>
- Jensen, J. (2010). *Local and regional food systems for rural futures* (RUPRI Rural Futures Lab Foundation Paper No. 1). Iowa City, IA: University of Iowa College of Public Health, Rural Policy Research Institute.
- Jones, M. (2009). Phase space: Geography, relational thinking, and beyond. *Progress in Human Geography*, 33(4), 487-506. <http://dx.doi.org/10.1177/0309132508101599>
- Kirschenmann, F., Stevenson, S., Buttell, F., Lyson, T., & Duffy, M. (2008). Why worry about the agriculture of the middle? In T. A. Lyson, G. W. Stevenson, & R. Welsh (Eds.), *Food and the mid-level farm: Renewing an agriculture of the middle* (pp. 3-22). Cambridge, MA: MIT Press.
- Kloppenborg, J. R., Hendrickson, J., & Stevenson, G. W. (1996). Coming into the foodshed. *Agriculture and Human Values*, 13(3), 33-42. <http://dx.doi.org/10.1007/BF01538225>
- Kneafsey, M. (2010). The region in food—important or irrelevant? *Cambridge Journal of Regions, Economy and Society*, 3(2), 177-190. <http://dx.doi.org/10.1093/cjres/rsq012>
- Kremer, P., & Schreuder, Y. (2012). The feasibility of regional food systems in metropolitan areas: An investigation of Philadelphia's foodshed. *Journal of Agriculture, Food Systems, and Community Development*, 2(2), 171-191. <http://dx.doi.org/10.5304/jafscd.2012.022.005>
- Kuznesof, S., Tregear, A., & Moxey, A. (1997). Regional foods: A consumer perspective. *British Food Journal*, 99(6), 199-206. <http://dx.doi.org/10.1108/00070709710181531>
- Low, S. A., Adalja, A., Beaulieu, E., Key, N., Martinez, S., Melton, A., ... Jablonski, B. B. R. (2015). *Trends in U.S. local and regional food systems* (Administrative Pub. No. 68). Washington, DC: U.S. Department of Agriculture, Economic Research Service. Retrieved from http://www.ers.usda.gov/webdocs/publications/42805/51173_ap068.pdf?v=42083
- Martinez, M., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., ... Newman, C. (2010). *Local food systems: concepts, impacts, and issues* (ERR-97). Washington, DC: U.S. Department of Agriculture, Economic Research Service. Retrieved from <https://www.ers.usda.gov/publications/pub-details/?pubid=46395>
- Massey, D. B. (2005). *For space*. London, UK & Thousand Oaks, CA: SAGE.
- McFadden, D. T. (2015). What do we mean by "local foods"? *Choices*, 30(1), 1-6. <http://choicesmagazine.org/choices-magazine/theme-articles/community-economics-of-local-foods/what-do-we-mean-by-local-foods>
- McKinney, M. J. & Johnson, S. (2009). *Working across boundaries: People, nature and regions*. Cambridge, MA: Lincoln Institute of Land Policy.
- Morgan, K., Marsden, T., & Murdoch, J. (2006). *Worlds of food: Place, power, and provenance in the food chain*. Oxford, UK & New York, NY: Oxford University Press.
- Mount, P. (2012). Growing local food: Scale and local food systems governance. *Agriculture and Human Values*, 29(1), 107-121. <http://dx.doi.org/10.1007/s10460-011-9331-0>
- Newman, L., & Dale, A. (2009). Large footprints in a small world: Toward a macroeconomics of scale. *Sustainability: Science, Practice, & Policy*, 5(1). <http://dx.doi.org/10.1080/15487733.2009.11908024>
- Onozaka, Y., Nurse, G., & McFadden, D. T. (2010). Local food consumers: How motivations and perceptions translate to buying behavior. *Choices*, 25(1), 1-6. <http://www.jstor.org/stable/choices.25.issue-1>
- Peters, C., Bills, N. L., Wilkins, J. L., & Fick, G. W. (2008). Foodshed analysis and its relevance to sustainability. *Renewable Agriculture and Food systems*, 24(1), 1-7. <http://dx.doi.org/10.1017/S1742170508002433>
- Ponte, S. (2016). Convention theory in the Anglophone agro-food literature: Past, present and future. *Journal of Rural Studies*, 44(4), 12-23. <http://dx.doi.org/10.1016/j.jrurstud.2015.12.019>

- Ruhf, K., & Clancy, K. (2010). *It takes a region...Exploring a regional food systems approach* (Working Paper). Kingston, NY: Northeast Sustainable Agriculture Working Group. Retrieved from <http://nesawg.org/sites/default/files/NESAWGRegionalFoodSystemFINALSept2010.pdf>
- Saberi, H. (2016, May). *Stuck in the middle with you: Peri-urban areas in the food system* [Blog post]. Baltimore, MD: Johns Hopkins Center for a Livable Future. Retrieved from <http://livablefutureblog.com/2016/05/stuck-in-the-middle-with-you-peri-urban-areas-and-the-food-system#more-10966>
- Sonnino, R. (2007). The power of place: Embeddedness and local food systems in Italy and the UK. *Anthropology of Food* [Online], S2. <http://aof.revues.org/454>
- Sonnino, R., Marsden, T., & Moragues-Faus, A. (2016). Relationalities and convergences in food security narratives: Towards a place-based approach. *Transactions of the Institute of British Geographers*, 41(4), 477-489. <http://dx.doi.org/10.1111/tran.12137>
- Thornton, P. K., Ericksen, P. J., Herrero, M., & Challinor, A. J. (2014). Climate variability and vulnerability to climate change: A review. *Global Change Biology*, 20(11), 3313-3328. <http://dx.doi.org/10.1111/gcb.12581>
- Tregear, A., Arfini, F., Belletti, G., & Marescotti, A. (2007). Regional foods and rural development: The role of product qualification. *Journal of Rural Studies*, 23(1), 12-22. <http://dx.doi.org/10.1016/j.jrurstud.2006.09.010>
- U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau. (n.d.). *Census regions and divisions of the United States*. Washington, DC: Author. Retrieved from http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf
- Zipper, J. (2014). *Federation of Southern Cooperatives/Land Assistance Fund works to end poverty and start social justice in the rural South* [Email Newsletter]. *Grassroots Economic Organizing [GEO] Newsletter*, 2(18). Retrieved from <http://geo.coop/story/federation-southern-cooperativesland-assistance-fund-works-end-poverty-and-start-social>

Resource guide sets the table for change

Review by Michelle Wander*
University of Illinois

Review of *Farm to Table: The Essential Guide to Sustainable Food Systems for Students, Professionals, and Consumers*, by Darryl Benjamin and Lyndon Virkler. (2016). Published by Chelsea Green Publishing. Available as hardcover; 272 pages. Publisher's website:
<http://www.chelseagreen.com/farm-to-table>



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Farm to Table: The Essential Guide to Sustainable Food Systems for Students, Professionals, and Consumers by Darryl Benjamin, sustainable food system educator and activist, and chef Lyndon Virkler, dean of the New England Culinary Institute, is a beautifully produced book that has much to offer the farm-to-table novice. The authors draw

on their substantial educational experience (Virkler has an MS in adult and higher education and Benjamin has taught at over a dozen northeastern institutions) and background in writing and literature to present readers with an overview of the evolving terminology, tactics, and organizations contributing to the farm-to-table movement.

The text is divided into two sections, Farm and Table, and relies on short, subject-focused sections supported by colorful visual and verbal illustrations to make the book read much like a blog. This makes it easy to enjoy in an intermittent “pick-up-and-put-down” manner, but less satisfying as a straight-through read. Even though it does not develop themes or use terms other than “farm-to-table” to unify the book, the authors do summarize the origins of the farm-to-table movement. The

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long-time alternative agriculture community will be perfectly comfortable with the goals of the farm-to-table farm philosophy, which strives to achieve the goals of providing a good living to farmers while both mimicking nature to provide a balance of resources and preserving soil and adjacent landscapes for future generations. Consumer advocates and food-system activists will appreciate the telling of how the movement evolved from one focused on the producer and means of production, to one that addresses societal goals through food systems and food regimes.

The first section ("Farm") nicely summarizes the problems of (chapters 1 and 2), and solutions to (chapters 3 to 5) industrial agriculture, but unfortunately does not provide evidence to support the authors' complaints about the environmental and human costs of agriculture. The number of concepts presented in short sections often results in superficial coverage; for instance, they note that declining shares of the food dollar have been returned to farmers since the 1990s, but do not explain the forces driving this (p. 28). Still, patient readers will come to understand the inter-related issues (e.g., the plight of farmers) and come away with an understanding of farm-to-table goals and critiques of the corporate power—supported by industrialization and consolidation—that favors profits and exploits the environment, people, and resources.

Readers will come away from the first section with some understanding of the reasons that sustainable agriculture advocates connect their success to diversity in plants, seeds, and livestock and desire changes in the crops and livestock produced, methods of production and distribution, and scale of agriculture. Readers will also begin to understand why a central thesis of the movement is that systems that benefit small-scale producers will benefit society at large. Along with this overview, the authors provide an up-to-date summary of actors working to maintain crop diversity and seed and breed access, and explain how ownership, market concentration, and laws are evolving to shape our food system. Readers will be glad to be pointed toward longstanding contributors to the movement (e.g., Seed Savers Exchange) and learn about important efforts (e.g., the Open Source

Seed Initiative). Tactics like taking the safe seed pledge to share varieties for others' use, increasing demand for diversity and taste, and sharing farmer knowledge are presented as ways to counter the consolidation of the industry and to protect seeds and breeds and support local food systems.

Part one sets the table for the second part of the book ("Table"), which covers the farm-to-table, farm-to-restaurant, farm-to-school, and farm-to-institution movements with chapters packed with up-to-date information and links to resources. Tactics and examples provided in the second section are likely to inspire activists interested in achieving farm-to-table goals discussed in the context of market scale.

This practical information is probably the most important contribution the book makes, as it provides resources and complements them with rich examples tailored for various audiences. Farmers who market directly are likely to focus on the sections written for them, as will institutional buyers and consumers, while those just getting started in local food purchasing efforts at institutions will benefit from the distinctions made about scale.

Overall, the book will serve as a primer for the reader who was not already familiar with the farm-to-table movement by providing a brief review of the sustainable agricultural critique as it has evolved in the U.S., but it may not be in-depth enough for academics. The documentation provided will probably not convince a skeptic of the full merit of the issues touched upon. I certainly had my gripes with the text and found gaps in coverage. For instance, readers will need to explore other resources to discover why cheap food is thought to be so costly and how the food system might simultaneously contribute to obesity and food insecurity—but the book will likely whet their appetite to do so. This resource guide will be most useful to adult learners who can follow up on assertions that, for example, small farms are more likely to achieve balance than large ones, or the intriguing statement that "for farms in the future to be sustainable, farm size should correspond to market size" (p. 88). The interested reader need only to pursue the work of John Ikerd, cited in association with both claims, and will be glad they did.

Still, subject matter experts are likely to find the book frustrating because it often glosses over or groups topics in ways that could confuse readers or obscure important nuances. For example, I thought it was misleading to juxtapose a section on nutrient-dense agriculture, which includes an agglomeration of topics and assertions that vary in terms of their scientific legitimacy, with integrated pest management, which is well-developed and widely accepted. But if domain experts resist letting perfection get in the way of the good, they should also like the book. Once I accepted that the authors were explaining the rationale driving the farm-to-table movement, and not trying to support the critique with copious amounts of evidence, I could appreciate the important point they seek to make: that the dominant farming system may not satisfy the human soul. I also enjoyed the use of Maslow's theories of human motivation and the hierarchy of needs (physiological, safety, love and belonging, and esteem) to evaluate the performance of industrial agriculture.

While the text is domestic in focus and centered in the Northeast—specifically Vermont—it

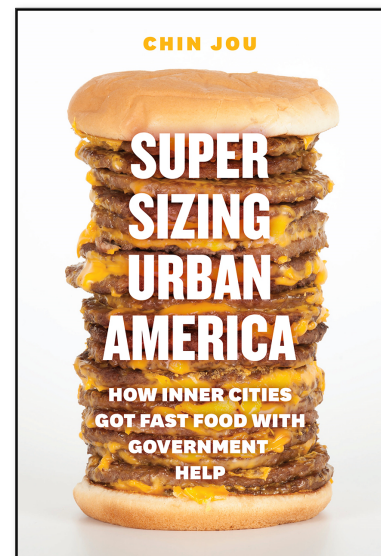
frequently refers to the global food system. It uses, for example, attempts to reverse the loss of biological heritage by the Ifugao people in the Philippines to illustrate how a return to more traditional production systems could sustain the ecology and economy of a once-threatened UNESCO site. While readers are left to translate the domestic application, it does offer a beautiful case example, and the regional emphasis of the book embodies the authors' bioregional tenets. Teachers in particular should appreciate their summary of seminal or classic case examples and coverage of major players contributing to the discussion fueling the farm-to-table movement. By contextualizing classic cases or examples of which the broader public is likely to have heard—like the Monsanto vs. Schmeiser lawsuit, Growing Power, or Michelle Obama's White House garden—and accompanying them with local, often colorful examples, they keep the reader's interest. In the end, these authors have curated an amazing smorgasbord of ideas and organizations and illustrated associated concepts with rich examples drawn from around the globe.



An unfortunate confluence of motives: Fast food as economic development

Review by Parke Troutman*
San Diego, California

Review of *Supersizing Urban America: How Inner Cities Got Fast Food with Government Help*, by Chin Jou. (2017). Published by University of Chicago Press. Available as hardcover and ebook; 248 pages. Publisher's website: <http://www.press.uchicago.edu/ucp/books/book/chicago/S/bo14193313.html>



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The food movement keeps returning to a handful of themes: the industrialization of food, the promise and challenges of local food, the shenanigans of large corporate players and the like. Rare is a work like Chin Jou's *Supersizing Urban America*, which explores a facet of food—one that has serious health consequences—in a potentially new and intriguing way by linking local food environments to a relatively obscure federal program.

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The majority of the book is a history of how fast food franchises came to dominate the urban landscape. Jou claims that as late as the 1960s, African Americans were eating better than whites (a claim with so many implications that it deserves a book in its own right). By the early 1970s, the Nixon Administration was looking for explicitly capitalist—that is, decidedly noncommunist—strategies to revitalize urban neighborhoods torn apart by the violence of the '60s. It focused on promoting black entrepreneurship.

Simultaneously, fast food corporations were reaching a saturation point in the suburban and highway markets where they had grown so explosively for almost two decades. Indeed, the revenue from those stores was showing vulnerability to rising gas prices, as the first oil shock made clear. Fast

food corporations knew they needed new markets, preferably not dependent on cars. Urban areas were a natural place to look but were seen as high cost/low return gambles.

The franchise model, in which a local person invests heavily for the right and technical know-how to open a brand-name store, became a bridge between the Nixon Administration's and corporate fast food's goals. The resulting mix of motivations and policies led to a one-two dance step. Franchising allowed companies like McDonald's to transfer risk to local entrepreneurs, and loan guarantees allowed a significant chunk of that risk to be transferred again to the federal government. The result was an effective model of growth, made all the more so by the increasing vacuum of supermarket chains abandoning inner-city areas.

Although partially stymied by poor record-keeping (federal) and limited access to files (corporate), this is a fascinating story. Jou approaches it from different angles, including not only that of the corporations and the federal government but also of franchisees and residents. The result is compelling. Jou only teases, however, at the moral ambiguity of everyone's actions. At the beginning of the period covered, what is now called the obesity epidemic was not so alarming as it is today. As the story marches forward through the decades, the destructive effects of unhealthy diets became increasingly obvious. The narrative acknowledges this, almost in passing, but does not squarely face how consumers, corporate leadership and government staff reconciled, or continue to reconcile, the consumption of fast food with its long-term consequences. This is a missed opportunity as it has implications for how we conceptualize urban food environments, especially the notion of a food apartheid.

The introduction through chapter five of this brief book cover the history and rise of urban fast food. These are its strength. When the book turns toward recent policies and possible reforms, however, it loses momentum. The review of more recent government policies and possible innovative approaches feels more obligatory than compelling. It is paralyzed by inconsistencies in the literature and the modesty of new proposals. Jou's response

to the lack of a clear direction forward leads to an unsatisfactory jump in the final pages to the conclusion that the only way food problems will be genuinely solved is by tackling inequality. If that were true, then it is not clear why someone should read this book instead of one on eliminating economic disparities.

The introduction alerts us that the conclusions might be underwhelming when it notes that others have criticized the federal government for supporting fast food, but then rejects that as a focus for the book, saying, "Rather, this book draws attention to the history of a slice of America's contemporary food environment..." (p. 6). Drawing attention to an issue is rewarded in academia, but if you're a legislative staffer for whom unhealthy food is only one of two dozen issues you have to track, if you're a nonprofit advocate whose schedule just got upended because that legislative staffer can only give you fifteen minutes during what was to be a conference call you were to facilitate, or if you're a resident who has to deal with the reality of your kids getting hungry three times a day, then you need more than having attention drawn an issue.

Realistically speaking, however, academics are not well positioned to map out practical political campaign strategies. What they can do—what others lack the time, analytical tools, and distance to do—is to analyze how ambitious proposals must be to get us to the change we want. If community gardens, farmers markets, improved school meals, soda taxes, etc., are not enough, what else needs to be done?

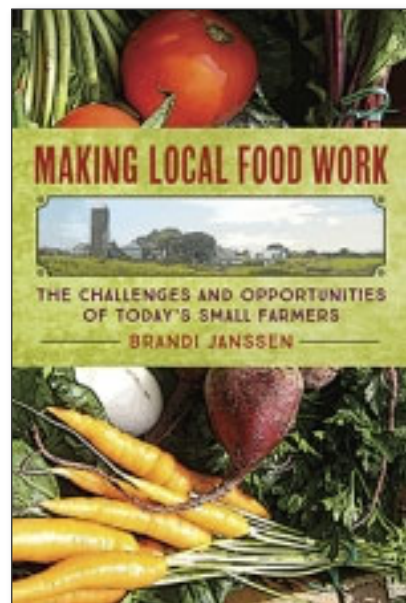
The limits of the last several chapters aside, by highlighting a government loan program that can be reformed, the book could spur creative strategies that go beyond the romanticized "community garden and farmers market" drumbeat that is still so often suggested as a way of improving local food environments. With any luck, Jou's work will start to build momentum around questions of the appropriate role of the federal government in helping local food businesses profitably sell healthier foods, a question made all the more urgent by the increasingly fierce supermarket price wars now underway.



A good start at building a successful local food system in Iowa

Review by Susan L. Valentino*
Goodlife Garden

Review of *Making Local Food Work: The Challenges and Opportunities of Today's Small Farmers*, by Brandi Janssen. (2017). Published by University of Iowa Press. Available as paperback and eBook; 230 pages. Publisher's website: <https://www.uiopress.uiowa.edu/books/2017-spring/making-local-food-work.htm>



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I have been frustrated by the lack of in-depth food and nutrition information available for both teaching and research regarding the effects of food on human health; hence I have been searching for tools that I can use to help educators,

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students, and the general public understand the U.S. food system. *Making Local Food Work* falls nicely into that category. Right from the outset, author Brandi Janssen does a marvelous job of describing a wide variety of interesting and innovative approaches being used by a new generation of producers in the now fastest-growing segment of the whole food industry: local food. In this review I share my thoughts about Janssen's work from several points of view—as an academic, an educator, an advocate, and a small farmer and market vendor.

As an academic teaching in the life sciences and active in the areas of food, farming, and health, I found that choosing communities in Iowa as the subject of her attention was well considered and

made the book more than just another accounting of the local food movement. Iowa is a good case in that local food producers and major industrial producers coexist in close proximity. This scenario lends itself nicely to Janssen's anthropological approach by providing interesting accounts of the perceptions of producers, including personal opinions of each other's agribusinesses and neighbors. For example, she skillfully addresses local conflicts and/or biases among neighbors.

As an advocate for both education about and transparency in food production, and for tactfully lifting the deliberate veil placed over much of the corporate food industry, I have been witness to much fruitless argument and accusation between the proponents of each side. The advocates of organic local food advocates often make the perfect the enemy of the good, even as corporate entities are beginning to see the profitability in organic local foods. I applaud Janssen's noncompetitive, nonconfrontational approach of presenting a well-balanced and pragmatic profile of the food production environment in Iowa.

The personal stories related in the book, whether critical of the industrial food system and its disproportionately large contribution to destruction of the environment and human health, or else embellishing the agrarian ideal of rural America, illuminate the desperate need for reason on both sides. It also, reveals how desperately people need help with understanding a very complex food system.

As an educator on how food affects health, I support any work that helps people to understand the food supply. Consumers cannot make good choices about food if they do not have adequate and accurate information regarding that food. Understanding the complexities of food production and socioeconomic influences on food availability gives consumers more power to exert over their local food systems and food environment. Janssen addresses the important aspects of food production that are necessary for the reader to gain a better understanding of the why and how of food production in the United States.

As a local food advocate, I also appreciate the comprehensive coverage of the local food movement in Iowa, a state that has long been at the core

of conventional food production. Again, the selection of Iowa makes the point that for the local food movement to succeed it requires the involvement of some parts of the conventional production system. Hence, Iowa is an ideal research locality to evaluate the potential for making local food truly work.

The current food environment in the United States is the product of the history of agriculture, including slavery, and it continues to represent the moral and political nature of American society. Janssen discusses the historical influence of Thomas Jefferson on some of the more unsavory aspects of the U.S. agricultural economy. She also shares some critiques of modern agriculture by early anthropologists like Walter Goldschmidt. In light of current social movements in the United States, more reflection on the aspects of the agricultural economy that formed the social and political foundation of the U.S. might have been valuable. I would also have liked to see Janssen expand upon the anthropological aspects of how food acquisition was, and still is, a powerful force in the formation of the moral character of both individuals and society.

Janssen also addresses often-overlooked factors in the local food movement, namely the higher price of local food and the unfortunate frequency of markets being located in largely affluent locations. These factors limit the capacity of the system to reach low-income customers. The discussion of the challenges to farmers markets to try to benefit everyone, not just the upper middle class, is an important one. As a vendor at a small farmers market that largely serves an affluent community of retirees and college students, I gained some useful insight from this book into how I might expand my enterprise to reach some less affluent communities through local farmer support agencies and grant programs. I also found many ideas for adding depth and new sources of income to my own agricultural business.

The chapters on more familiar components, like community supported agriculture (CSA), the green movement, and farm-to-school programs, were comprehensive and covered a wide variety of products and producers—from fruits and juicers to large herds and meat and poultry

producers. Janssen focuses in particular on farm-to-school efforts. Her discussion of the political and systemic difficulties in initiating even the simplest farm-to-school programs is spot-on. Janssen again addresses in detail how education and understanding of food production by the uninitiated is paramount to success in such endeavors.

Janssen's emphasis on the potential of local

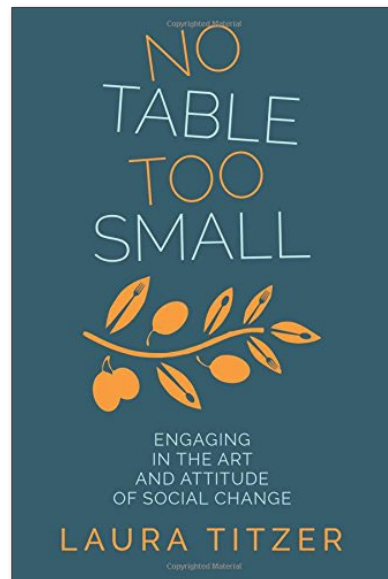
food systems elevates the prospect of making these systems stronger. It also offers hope and encouragement for small farmers, or market gardeners like myself, to make a living. To provide local food security these systems must be resilient. Janssen's presentation of the many faces of local food will serve to help the uninitiated who read *Making Local Food Work* to build more sustainable and reliable sources of food.



Confronting entrenched viewpoints to overcome polarity and prompt social change in the food system

Review by Emily Nink *
Boston, Massachusetts

Review of *No Table Too Small: Engaging in the Art and Attitude of Social Change*, by Laura M. Titzer. (2017). Published by CreateSpace Independent Publishing Platform. Available as paperback and eBook; 190 pages.



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In a year defined by political turmoil and policy surprises, food justice activists are emerging from a new phase of strategic visioning for broader growth and deeper impact. The recent political shift at the federal level (and its exposure of latent, persistent cultural and political polarization) has

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catapulted food systems strategizing into a new mode of thinking—thinking that probes more existential, root-cause issues. My inbox has been filled with indications of the food movement’s soul searching, with such questions as: “How can we shift what’s politically feasible and get at deeper root-cause issues?”; “How can we mobilize more young people than ever before into the fight for food justice and broader resistance?”; and “How can we help massively shift consciousness in urban and rural communities around issues of corporate control and white supremacy in our food system?” (H. Weinronk, Real Food Challenge, personal communication, May 23, 2017).

Laura Titzer’s timely handbook, *No Table Too Small: Engaging in the Art and Attitude of Social Change*,

may not have all the answers to these big questions, but it provides tools for digging deeper into critical issues, bridging divisions across sociocultural and political groups, and co-creating a vision for a broader, more inclusive food movement.

Throughout the book, which is divided into sections based on six capabilities of a successful change agent, Titzer focuses on *processes* that could enable social change, rather than *outcomes*. Writing from her extensive personal experience as a group convener and facilitator, she provides anecdotal evidence of the importance of these six capabilities. Her discussion delves into theories of change only briefly, in keeping with her own advice of breaking down an “expert-driven culture” that she believes could be detrimental to the collaborative success of the food movement.

The first capability of a change agent—**holding space**—involves allowing group participants to define the meeting or workshop agenda, overcoming surface-level conflicts of interest to find areas for collaboration, and engaging in a culturally competent matter. These are generally understood, and yet widely underused, practices that could benefit virtually every kind of meeting or workshop.

Components of the second capability, **communication**, include “deep listening,” asking questions, relating to others, and practicing empathy. Rather than employing the tools of communication in the pursuit of conflict *resolution*, Titzer suggests that conflict *management* may be a more realistic goal; by using good communication to embrace points of conflict with opponents, she suggests, participants may confront their own entrenched viewpoints in an empathetic, constructive way. She also invites readers to extend the idea of conflict management to imagine collaboration between organizations that may seem “diametrically opposed” (e.g., Monsanto and La Via Campesina), proposing that facilitation could allow representatives from these organizations to discover shared values (pp. 74–76). Many passionate food activists—especially those who have committed to lengthy work on a single issue or worked directly in opposition to corporate control of the food system—may find this message hard to swallow, yet Titzer’s invitation to imagine successful collaboration

between opponents may be appealing to others for its bottom-up approach and emphasis on changing individual beliefs and assumptions in order to engender organizational and institutional shifts.

“**Reflection in action**” dwells in what Titzer calls “points of intervention.” First defining these points as uncomfortable moments in which a facilitator must adapt to the circumstances of a particular meeting on the fly, she then moves on to discuss points of intervention for behavioral changes. The reader begins to glimpse an underlying theory of social change: “change is relentless incrementalism” (p. 91). Making the case for “brave public acts,” Titzer regards intervention points for behavior change as instruments for moving through a “cycle of social change to end up with new structures in place” (p. 92).

Cocreation, the fourth capability, is “the ability to involve all actors directly, and in some cases, repeatedly, from beginning to end to achieve a compelling purpose” (p. 109). Arguably, this definition is broad enough to capture the concepts of the other five capabilities; for instance, communication, reflection in action, and leadership all seem to contribute to a co-created vision for food system change. In revisiting cultural competency as a “component” of co-creation, Titzer is able to expand upon concepts introduced in the “Holding Space” section, and begins to apply the best practices introduced earlier in the book to the process of influencing public policy.


In the first four chapters, the discussion floats freely between the role of the facilitator and the roles of the participants, leaving the reader to wonder if the author considers *everyone* in a given group to be a change agent, or whether there is meant to be a facilitator guiding the discussion and inspiring these capabilities in others. The fifth capability, **leadership**, brings the focus back to the role of the organizer. Titzer sees this leader as responsible for maintaining certain co-existing conditions within the group: disequilibrium (surfacing conflict and disrupting patterns), amplification (bringing new people in and magnifying impact), and self-organization (stabilizing feedback from the amplification process).

“**Systems thinking**” involves identifying and recognizing the many sectors, stakeholders,

processes, and relationships that make up the ecology of the food system. Viewed as a network, rather than a hierarchy, these many actors represent the multitude of voices referenced by the other chapters; the food system is the setting in which the practices of conflict management, communication, and collaboration are meant to take place.

Taken together, these six capabilities illustrate not only a successful change agent, but also the ideal group dynamic, extending far beyond the leadership role of a community organizer to inform all types of participants at the metaphorical table. Although the topics presented are abstract, and the writing style tends to obscure the author's meaning, the underlying lessons could certainly be applicable to the process of social change in the food system. While anyone working in that space might benefit from Titzer's reflections, those who are more seasoned might extract particular value by applying

her lessons learned to their own personal experiences with group facilitation.

In the face of new political challenges, organizers working to build a broader food justice coalition are employing new strategies, including "Developing new and deeper alliances with groups working on other related issues... finding unlikely allies in the private sector... and convening both the 'usual suspects' and new constituencies to analyze and advocate for improvements to food environments and nutritional health, and mobilize constituencies before extensive harm is done" (Cohen, Poppendieck, & Freudenberg, 2017, pp. 55–56). As these emerging strategies gain momentum, the time is ripe for organizers and change agents to reflect deeply on the individual and cultural changes needed to achieve collaborative success, and broader social change, in today's polarized sociopolitical environment. 

Reference

Cohen, N., Poppendieck, J., & Freudenberg, N. (2017). Food justice in the Trump age: Priorities for urban food advocates. *CUNY Academic Works*. Retrieved from http://academicworks.cuny.edu/sph_pubs/161