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Maximize impact, minimize resources: Locating food deserts and increasing SNAP spending on fruits and vegetables

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Abstract

Many community organizations addressing aspects of food insecurity have not traditionally participated in food systems development and are often not familiar with the populations most affected by food insecurity. Needs assessments are commonly used to better understand community issues and target populations, but can they be lengthy processes that often require significant resources to facilitate. We present a case study of Duval County, Florida, in which we develop an assessment procedure for identifying food-insecure communities and determining the specific locations

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in which food-security programming has the greatest potential to increase local fruit and vegetable purchasing by SNAP households. This assessment draws on existing databases, thus reducing the resources required to conduct the analysis and allowing organizations to implement programming in a timely manner in areas where there is potential to see the greatest gains in reducing food insecurity.

Keywords
food insecurity, food systems, food deserts, needs assessments

Introduction

Communities are increasingly turning their attention to local and regional food systems as both an economic development strategy and a potential solution to growing food insecurity. The U.S. Department of Agriculture's *Know Your Farmer, Know Your Food Compass* highlights thousands of programs across the country that focus on some aspect of local and regional food systems (USDA, n.d.). Project objectives usually include improving physical and/or economic access to healthy, nutritious food for food-insecure populations and/or creating additional market opportunities for farmers. Specific projects are often part of a larger strategy aimed at improving the local economy through local and regional food systems development.

Food systems development is an inherently interdisciplinary approach to addressing a variety of community issues, such as health outcomes, access to food, unemployment, and protecting green space, for example. Participating in or leading this type of programming can be challenging for organizations accustomed to more limited roles as subject matter specialists in a more narrowly defined field (Conglose, 2000). Organizations must work together and maximize each other's skills and expertise to develop crosscutting programming to address community food issues (Hamm & Bellows, 2003). Project collaborators can include but are not limited to farmer organizations, local government, health departments, school boards, financial institutions, and environmental conservation organizations. These organizations may have less expertise or familiarity with food systems issues or the population they are trying to serve. For this reason, project teams will often rely on some form of a needs assessment to learn more about the problem and the communities affected by these kinds of broad social issues (Pothukuchi, 2004). Needs assessments are typically used to identify which communities an issue affects and how they are affected (Caravella, 2006; Raison, 2014). However, field-based needs assessment procedures can require a substantial commitment of resources by project collaborators.

In this case study, we present an assessment procedure using existing data resources that we developed for identifying food-insecure communities with the most potential for local fruit and vegetable sales to SNAP households. The proposed assessment procedure requires less effort and resources than what may be required to facilitate a complete needs assessment, and may be sufficient for many local service providers who want to identify the geographical areas that offer the greatest opportunity for improving food security or accomplishing other food systems development goals. This assessment is also useful for multidisciplinary project teams composed of individuals and organizations with varying expertise regarding food systems development and the communities the projects aim to serve.

Literature Review

It is not uncommon for community food systems projects to involve a variety of partners. Project teams are generally composed of professionals representing community organizations, private businesses, and local government. Unlike many traditional community initiatives that are implemented by a single organization, each individual on the project team is employed full-time and participating as a project *collaborator* or volunteer; therefore, working on that particular food systems project is rarely his or her primary professional responsibility. This becomes a challenge for project teams because the individuals on the team do not have much time in their professional roles to devote to the project. In addition, individual organizations represented on the project team usually have limited or no financial resources

dedicated to the initiative. As a result, project teams become charged with the task of facilitating community initiatives that accomplish specific objectives with limited resources.

Big Goals, Limited Resources

Collecting data that are representative of a community can require a lot of effort on the part of project collaborators; with limited human and financial resources, this can depend heavily on volunteers. A common approach in facilitating community food assessments that seek to map local food venues and determine the availability of food is to canvas entire neighborhoods, communities, or in some cases counties or regions (Palmer, Smith, Haering, & McKenzie, 2009). This type of assessment requires an extensive amount of time and often depends on volunteers. After the data have been collected, analyzing the results requires research expertise and can also be rather time-consuming, depending on the amount and type of data collected. Pothukuchi (2004) advises community groups to seek assistance from professional planners to ensure that the information collected is valid and useful for community development and policy decision-makers, which increases the need for financial resources. Salt Lake City, Utah, for example, hired a consulting firm to facilitate a local community food assessment that would be the basis for a long-range plan addressing identified community needs and interests (Carbaugh Associates, Inc., & VODA Landscape + Planning, 2013). They created original research instruments that assessed multiple aspects of Salt Lake City's food system within a 250-mile (400-kilometer) radius of the city. Initiatives such as these require enormous resources even when implemented on a smaller scale at the community or neighborhood level. Similar projects addressing food access and availability can take a year or more, require substantial personnel support, rely on federal grant funding, and use multiple research methods that necessitate research expertise to analyze (Bleasdale, Crouch & Harlan, 2011; Crouch, Phoenix Revitalization Corporation, & Harlan, 2011; Liese, Weis, Pluto, Smith, & Lawson, 2007; Pothukuchi, 2004; Raja, Ma, and Yadav, 2008).

Existing Measures

Currently, there are few options for project teams operating on limited human and financial resources and lacking research methods expertise. The USDA has developed several assessment toolkits to explore community- or household-level food indicators, removing the need to create original research measures. However, many of these assessments still require extensive time to collect data or expertise to analyze the results. For example, the Current Population Survey Food Security Supplement assesses household food expenditures, food spending need, food program participation, food sufficiency, and household ways of coping with food insecurity (USDA, ERS, n.d.-a). This survey consists of five sections totaling over 80 items. Data are collected monthly by the Census Bureau and compiled into a yearly report. This database can be useful for comparing individual communities to national trends; however, collecting this data independently on a local scale can be a costly and time-consuming process (Bickel, Nord, Price, Hamilton, & Cook, 2000). The USDA's Community Food Security Assessment Toolkit is another useful tool when local service providers want to facilitate a comprehensive needs assessment (Cohen, Andrews, & Kantor, 2002). The toolkit includes established quantitative and qualitative instruments for assessing household food security, food resource accessibility, availability and affordability of food, and community food production resources. Overall, this is an excellent resource for local organizations that want to facilitate an in-depth analysis of various aspects of local food systems. Organizations can also benefit from an in-depth analysis such as this one because the process can enhance community capacity for addressing food issues by building a cadre of individuals and organizations to address the problem, which is a necessary step for successful community based projects. The efficacy of existing instruments like these is not under scrutiny. The authors recognize that several useful techniques for facilitating community food assessments already exist. However, all of these techniques require some combination of time, money, and expertise that is often limited or unavailable to organizations or multi-organizational efforts addressing community food needs.

New Instrument Development

In addition, existing instruments do not always capture the data needed for a specific project, forcing project teams to modify existing instruments or create their own. Liese et al. (2007) developed an original survey and interview instrument for their assessment of food availability and price. Van Hoesen, Bunkley & Currier (2012) revised an existing methodology for mapping food sources available to rural communities and evaluating the quality and diversity of food available through each source using geographic information systems (GIS). Meenar & Hoover (2012) also used GIS analytic methods to examine how urban agriculture affects food insecurity in Philadelphia using preexisting data they purchased from five different sources. The project team also developed original survey and interview instruments and completed 35 field visits to record field observations. Other disciplines have developed assessment procedures designed to reduce the human and fiscal burden on project teams that could serve as useful models for food systems work.

Examples from Other Disciplines

Rapid rural appraisal (RRA) is one of the more widely utilized and adapted rapid assessment techniques. RRA was originally developed as a way to assess rural conditions, specifically agricultural and environmental conditions, when personnel, finances, and time are limited (Carruthers & Chambers, 1981). Since its inception in the 1970s the idea of rapid assessment procedures has been adapted for many uses, including assessment of the ecological condition of wetlands, management of protected areas, mortality risk, potato seed systems, development of local knowledge networks, and identification of agricultural research priorities, to name a few (Ervin, 2003; Fennessy, Jacobs, & Kentula, 2007; Ilangantileke, Kadian, Hossain, Hossain, Jayasinghe, & Mahmood, 2001; Ison & Ampt, 1992; van Bodegom et al., 2009; Zanetell & Knuth, 2002). The specific steps taken to complete a rapid assessment vary with each project, but in general the approach involves quickly collecting data that can be used to guide project objectives. For example, the Urban Management Programme (UMP) developed the rapid urban environmental assessment approach in response to the need for "urban environmental research that is comprehensive, multisectoral, relatively short term, and consistent between cities" (Leitmann, 1994, p. 9). Likewise, the rapid impact assessment matrix (RIAM) was developed as a tool for environmental planners for the purpose of streamlining the organization, analysis, and presentation of environmental impact assessments (Pastakia & Jensen, 1998).

Rapid assessment has been criticized by some for the degree to which results are reliable and valid. Van Bodegom et al. (2009) evaluated the validity of a rapid assessment technique for identifying mortality risk based on socioeconomic data. They concluded that the rapid appraisal method was not only valid, but at times more accurate than more in-depth and cumbersome methods. Other common names for rapid assessment techniques include rapid epidemiological assessments and rapid assessment procedures (Manderson & Aaby, 1992). McNall and Foster-Fishman (2007) review commonalities and differences between rapid evaluation and assessment techniques and offer suggestions for facilitating rapid assessments that are both feasible and credible, which we have tried to apply in this case study. Among their recommendations is establishing clear objectives for the rapid assessment so that appropriate data are collected from appropriate sources and the process is not slowed by altering which data are needed and from whom.

Developing an Assessment Procedure for Food Security Projects

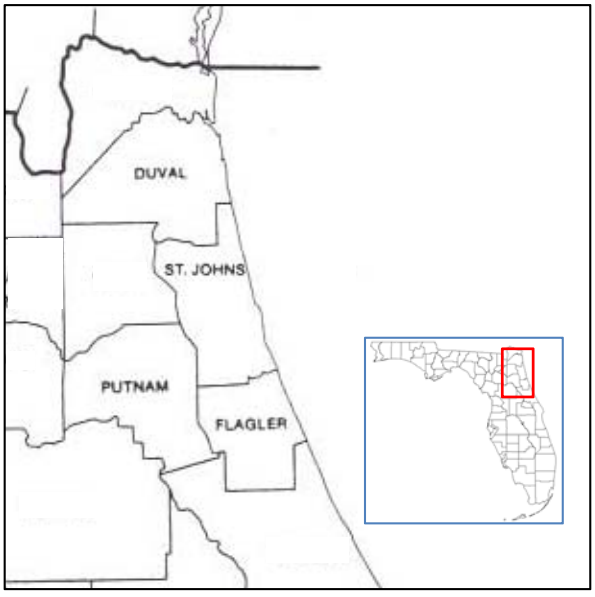
Reducing food insecurity is a common objective for many community food projects. Our rapid assessment technique is useful for identifying food-insecure communities with the highest potential for increasing local fresh fruit and vegetable sales to SNAP households. We define food security based on community-level indicators rather than household-level indicators, such as those used in the Community Food Security Assessment, in order to reduce the amount of data needed and identify communities or neighborhoods where community food programming would be most effective. We therefore choose to use food deserts as an indicator of food security in this assessment

procedure. The link between food deserts and food insecurity is widely recognized (Apparico, Cloutier, & Shearmur, 2007; Hendrickson, Smith, & Eikenberry, 2006; Shaw, 2006; Ver Ploeg, et al., 2009; Walker, Keane, & Burke, 2010; Wright Morton, Bitto, Oakland, & Sand, 2005). The U.S. Centers for Disease Control and Prevention (CDC) define a food desert as an area that lacks outlets for access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet (CDC, 2012). It is well established in the literature that income, distance to a food store, vehicle ownership, and the availability of public transportation are some of the factors that can affect access and availability of food (Dutko, Ver Ploeg, & Farrigan, 2012). These same indicators are used to identify food deserts.

Case Selection

This assessment procedure was developed for use in the three northeast Florida counties that make up the Tri-County Agricultural Area (TCAA) along with an additional county. The TCAA comprises Putnam, Flagler, and St. Johns counties. The city of Jacksonville, Florida, lies in neighboring Duval County. Duval County was included in the project due to the regional economic impact of Jacksonville in the TCAA (Figure 1).

Figure 1. Case Study Area Consisting of Duval, St. Johns, Putnam, and Flagler Counties, Florida



We selected this case because of the enthusiasm expressed by local organizations, government, and extension for regional food systems development with a particular interest in reducing food insecurity, and the existence of a community food systems collaborative group already working in this area. The researchers have collaborated with a variety of community groups in northeast Florida on multiple other food projects as well, including assessing the availability of transportation to grocery stores, establishing a new farmer cooperative, and exploring the feasibility of a mobile farmers market. Project collaborators include economic development councils, a new farmer cooperative, county extension services, county and city governments, nonprofit organizations, and financial institutions. This group works together frequently to accomplish the overall goals of reducing food insecurity in northeast Florida and expanding marketing opportunities for local farmers. As part of their ongoing efforts the project team wanted to facilitate programming to target SNAP recipients in particular. The project team turned to the authors of this case study to assist in accomplishing the objectives of this assessment.

Like many community food systems initiatives, there were no individuals dedicated full-time to developing this assessment procedure. All but one of the individuals associated with the development of this assessment procedure are employed by the University of Florida's Institute of Food and Agricultural Sciences and are expected to assist the communities we serve in addressing social issues as part of our permanent job descriptions. There was also no specified budget for this case study, so it was important to accomplish the stated objectives efficiently. We did not want to engage in original instrument development due to time and cost limitations, so we chose to focus on gathering as much information as possible using existing data resources.

Assessment Development

This assessment procedure was developed based on the specific goals and objectives of the community food group in northeast Florida described above. The goals of this ongoing collaborative

effort are to reduce food insecurity in four northeast Florida counties and expand marketing opportunities for local farmers. The assessment procedure developed in this case study provides information to the project team that will facilitate programming to move the project team closer to accomplishing their overall project goals. The specific objectives of this assessment procedure are to: (1) identify food insecure communities; (2) estimate the value of Supplemental Nutrition Assistance Program (SNAP) benefits available in the identified communities; and (3) determine the communities with the most potential for local fresh fruit and vegetable sales to SNAP households. We followed the six steps presented below to accomplish these objectives.

Step One: Determine Indicators and Level of Measurement

First, we identified available data resources and evaluated their suitability for achieving the stated project objectives. We were interested specifically in identifying publically available resources in which the data was tied to a specific geographic location. It was imperative we could link the data to a specific geographic location so we could identify the area that presented the greatest opportunity for increasing SNAP spending on local fruits and vegetables. We therefore focused on geographic databases that provided information on food insecurity indicators at the community or neighborhood levels.

We selected the USDA Food Access Research Atlas (FARA) database to accomplish our first objective, identifying food insecure areas. The FARA identifies food deserts at the census-tract level based on 2010 census data using a number of indicators and at various levels of measurement. The available indicators are low-income, low access to supermarkets, low vehicle access, and high group quarters, each of which is defined below. The user can identify all census tracts that meet only one of the criteria or select a combination of indicators. The FARA automatically classifies census tracts that are both low-income and low access as a food desert. The FARA defines low-income tracts as those census tracts that (1) have a poverty rate of 20 percent or more, or (2) a median family income less than 80 percent of the statewide median family income, or (3) a median family income less than the surrounding metropolitan area for census tracts in metropolitan areas. Individual households are classified as low income if total family income falls below 200 percent of the federal poverty threshold. The federal poverty threshold is dependent on the size of the household.

The definition of "low access" is more complex. The default definition of low-access census tracts in urban areas, which the atlas automatically identifies, is census tracts where it is more than one mile (1.6 kilometers) to a supermarket for a significant share of the population. The user can change the distance to a supermarket to half a mile (0.8 km) for urban areas or 10 miles (16 km) or 20 miles (32 km) for rural areas if desired. A tract is identified as low access if more than 500 individuals or 33 percent of the tract population is further than the selected distance to a supermarket. Users can also include an additional measure of vehicle access. Tracts with low vehicle access have at least 100 households more than half a mile (0.8 km) from a supermarket who do not own a vehicle, or, regardless of vehicle ownership, have a significant share of the population (500 people or 33 percent) who are at least 20 miles (32 km) from a supermarket.

The FARA will also identify high group quarters census tracts, defined as tracts in which at least 67 percent of the population live in group quarters situations. Group quarters refer to housing units for multiple individuals or families that are owned by an organization. Individuals living in these units often receive services from the organizations as well. College dorms, nursing homes, and homeless shelters are examples of group quarters.

We did not include vehicle access or high group quarters as indicators in our analysis because these were not relevant to our stated project objectives. This information might be valuable for projects that target a particular population, such as elderly in assisted living facilities, or that aim to address transportation challenges, like expanding public transportation routes to provide neighborhoods with low vehicle ownership a direct route to a supermarket, for example.

Step Two: Identify Food Desert Clusters

The FARA identifies all census tracts that contain the indicators at the level of measurement the user selects. However, most community programs are not implemented at the census-tract level but rather at a community or neighborhood level. We therefore chose to group census tracts into clusters of tracts with contiguous borders. Census tracts in close proximity to one another typically share some population characteristics and market dynamics that are useful for developing projects or programs. Grouping the census tracts into clusters also simplified defining the geographic boundaries of food-insecure areas.

We grouped the census tracts with contiguous borders into clusters, listed the census tracts forming each cluster, geographically defined the area, and designated the roads bordering the cluster. Figure 2 provides an example from Duval County, Florida.

We recorded the Federal Information Processing Standards, or FIPS code, for each of the census tracts within a cluster by clicking on each tract in FARA. The FIPS code is a 15-digit number used to identify all census tracts. The first two numbers represent the state code. The next three numbers represent the county code, and the final six numbers are the census tract code. We also learned there is an implied decimal between the fourth and fifth digits of the census tract code. Some census tracts may not have numbers after the decimal place, for example census tract 0133.00 in Duval County, while others might, 0144.01, for example. Some databases, such as the U.S. Census, include the decimal point in their information. The FIPS code is important to record in order to find information about a particular census tract in other databases.

Step Three: Identify Zip Codes Represented in Each Cluster

We found that the zip codes represented by the census tracts forming a single cluster are important because they provided a way to examine the availability of other resources within the community, such as churches, schools, and community service agencies. We believe these resources can be approached as future project collaborators or may be useful when implementing project initiatives. For example, local churches could be used as a mobile farmers market site, and community service agencies may offer space for community education classes.

Unfortunately, census tract and zip code boundaries do not match. Zip code boundaries usually encompass a larger area than a single census tract. Zip code areas are based on geographic location, are designated by the U.S. Postal Service, and are subject to change based on population density. Census tracts include a smaller segment of the population (between 1,200 and 8,000 inhabitants) and are fairly stable in order to make comparisons over time.

To determine the zip codes included in each cluster, we visually overlaid the map of a cluster with the corresponding zip code map (sourced for free from United States Zip Codes, at http://www.unitedstateszipcodes.com) using a simple photo-editing program that allowed us to change the transparency of images. Figure 3 provides an example using a single cluster identified in Duval County in step 2.

Figure 2. Cluster of Four Census Tracts Identified as Food Deserts in the North End of Jacksonville, Florida

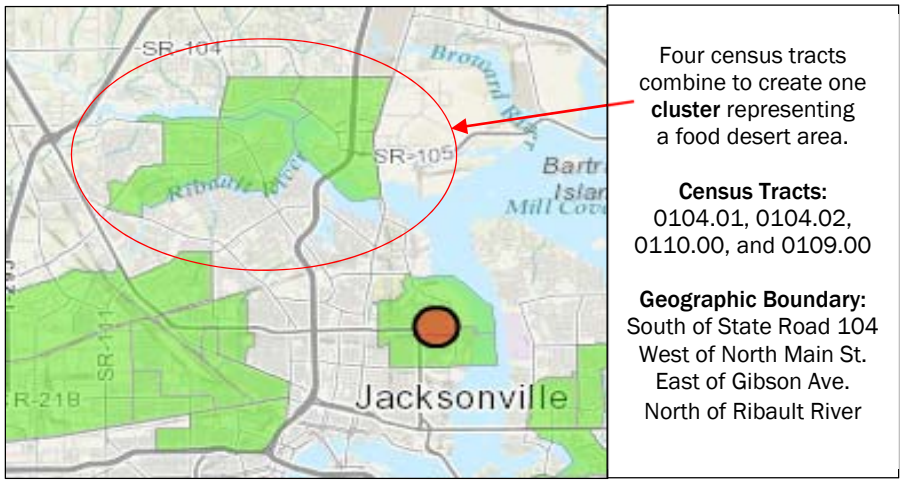
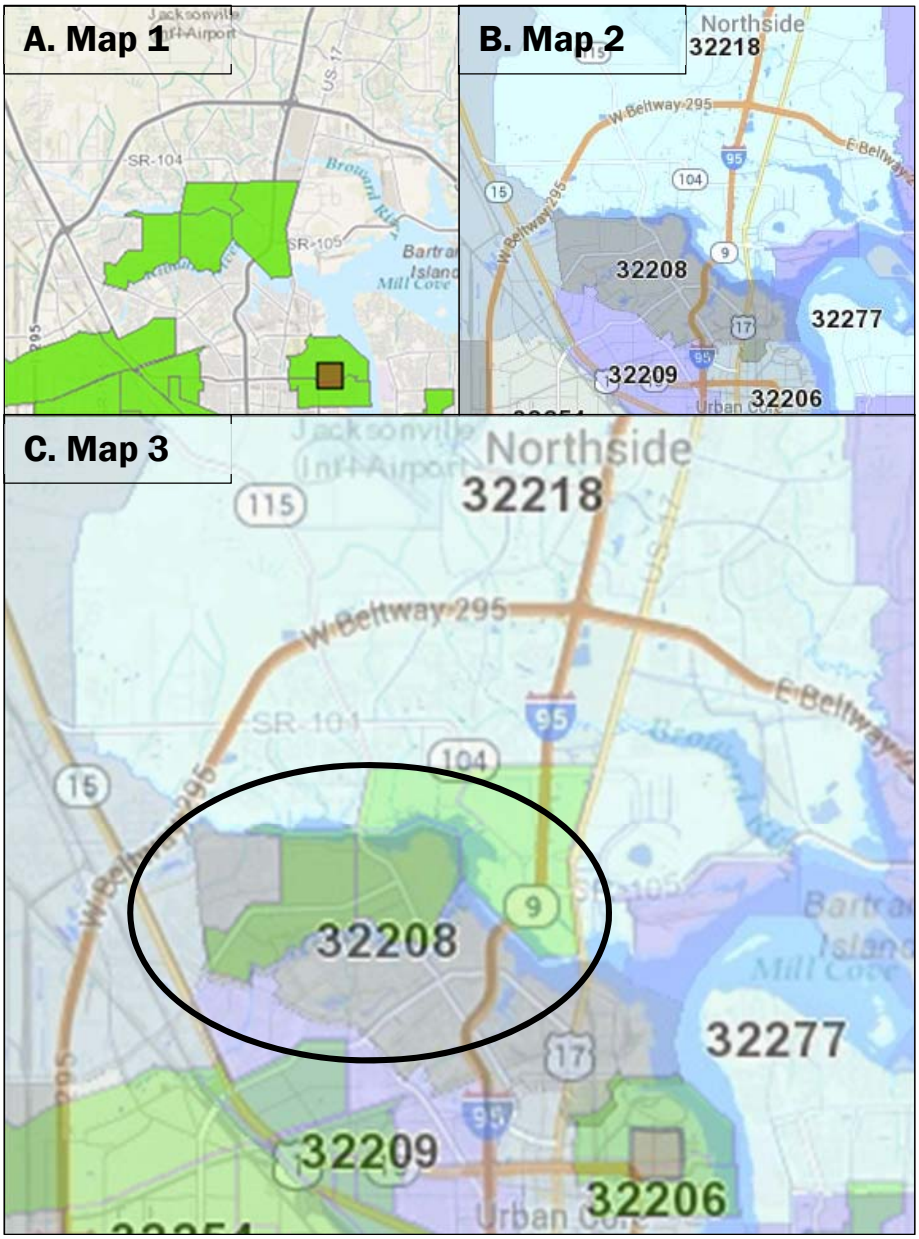


Figure 3: Identifying Zip Codes Within the Cluster Area. (A) Clusters identified using the Food Access Research Atlas; (B) Zip code map of area the cluster is located in retrieved from www.unitedstateszipcodes.com; (C) Visual overlay of maps A and B showing the food desert cluster includes two zip codes.



Step Four: Explore Population Characteristics

Community programming requires an understanding of the population in the communities being served. We discovered that the FARA displays detailed information about the households within each census tract if we clicked on the tract. For example, 10 percent of households in census tract 0110.00 do not have vehicles and live more than half a mile from a supermarket. Other information available included the number of housing units and total population, the portion of the population living in group quarters, the number and proportion of individuals living various distances from a supermarket, the number and proportion of individuals who are low income, level of access to vehicles, and the number of children and elderly affected by food insecurity.

Next, we compiled the information of interest into a table for each census tract within the cluster. The information of interest will vary depending on project goals and objectives; for our project we were particularly interested in the number of low-income and low-access individuals and the number of housing units without vehicle access. Table 1 shows the population characteristics for one of the food-insecure clusters identified in Duval County.

Step Five: Calculate SNAP Expenditures

This next step of our procedure used the American Community Survey to determine the number of households receiving SNAP benefits per census tract. The U.S. Census Bureau completes the American Community Survey (ACS) annually. The

Table 1. Selected Population Characteristics for Identified Food Desert Cluster in Duval County, Florida, Including Total Population and Number of Households, Number and Proportion of Individuals Experiencing Low Access (LA) And Low Income (LI) and the Number and Proportion Also Without Vehicle Access (VA)

Census Tract	Total Population	Total Households	Individuals LA and LI		LA Housing Units Without VA	
			#	%	#	%
0104.01	3,240	1,194	583	18%	84	7%
0104.02	3,955	1,635	572	14%	48	3%
0110.00	3,998	1,534	1,026	26%	50	3%
0109.00	4,017	1,547	464	12%	28	2%
Cluster Totals	15,210	5,910	2,645	17.39%	210	1%

ACS offers data at the census-tract level regarding a variety of variables useful to many different kinds of community initiatives. It provides demographic information about individuals such as age, sex, race, educational attainment, and income, and household-level information such as insurance status, estimated household expenses, and employment status. We searched for the census tracts of interest to find all available data sources for those census tracts. We then searched for data related to "SNAP" and found a table titled "Food Stamps/ SNAP" that provided county-level data as well as individual census-tract data for each of the census tracts in the cluster.

Our second project objective sought to estimate the value of SNAP benefits available in the identified food deserts. We chose to use the ACS to identify the total number of households receiving SNAP benefits in each census tract, but this was not enough information to accomplish our objective. For our objectives we also needed a measure of the magnitude of SNAP benefits received. The USDA Economic Research Service's (USDA, ERS) SNAP Data System provides information at the state and county levels regarding SNAP participation and benefits. We chose this database to determine average monthly household benefits received by county. We located the most recent data for county-level "SNAP Benefits" and then "average monthly SNAP benefit per participant." We used the ACS and SNAP Data System together to calculate an estimate of the total SNAP benefits received in each census tract and a total for each cluster.

Step Six: Calculate Potential Consumption of Fruits and Vegetables

Our third objective was to determine the areas with the most potential for local fresh fruit and vegetable sales to SNAP households. We therefore needed an estimate of fruit and vegetable purchasing for food-insecure individuals. The USDA Thrifty Food Plan (TFP) provides a healthful and minimal cost meal plan that shows how a nutritious diet may be achieved with limited resources. The standards established in the TFP are used to determine the level of SNAP program benefits individuals are eligible to receive. As part of the 2006 TFP, a study was commissioned by the USDA ERS presenting data showing food consumption by food type for 15 age and gender groups (Carlson, Lino, Juan, Hanson, & Basiotis, 2007). We used the data available in this study to estimate the average amount of fruits and vegetables purchased per person across all age groups.

The study estimated that the average amount of fruits and vegetables purchased per person across all age and gender groups is 14.872 pounds (6.75 kilograms) per week (Carlson et al., 2007). To our knowledge Carlson's work presents the most recent and complete estimation of fruit and vegetable purchases in the U.S. We used this estimate to calculate the potential purchasing of fruits and vegetables by individuals living in a food desert cluster assuming that all low-income and low-access individuals consumed the average amount of fruits and vegetables estimated by Carlson et al. (2007). It is unlikely individuals in each cluster are currently purchasing this amount of fresh fruits

and vegetables due to lack of access and income. However, with increased availability of fruits and vegetables and the assistance of SNAP benefits, we are considering this the *potential* for purchases.

We multiplied the total number of individuals who are low-income and low-access in a cluster (Table 1, Column 4 Total, 2,645) by the estimated 14.872 pounds (6.75 kg) of fruits and vegetables purchased per week, then multiplied this by 52 weeks to calculate the annual fruit and vegetable purchasing potential for the cluster. This information could also be used in other projects for program planning at the county level by totaling the results for all food desert clusters within a county.

Case Study Results

We applied this assessment procedure to four northeast Florida counties: St. Johns, Putnam, Duval, and Clay counties. Below we present the results from each step in the procedure outlined above and, for illustrative purposes, highlight our analysis for Duval County. The city of Jacksonville lies at the center of Duval County. The population of Jacksonville is approximately 850,000 people. The median income in Jacksonville is roughly US$48,000, and 16.1 percent of the population was at or below the poverty line from 2008 to 2012.

The FARA automatically identifies census tracts that are both low income (LI) and low access (LA) according to the criteria described above as food deserts. We chose to use one mile (1.6 km) to a supermarket to designate an area as low access in Duval County because this is the standard distance used by the federal government in urban areas (Dutko et al., 2012). We identified 29 census tracts as food deserts in Duval County based on the indicators we chose to include in our analysis.

Seven food desert clusters were identified in Duval County (Figure 4). A single census tract lying along the eastern coastline was identified as a food desert in step one but was excluded from further analysis due to its proximity to other food desert census tracts.

We used the tables created in steps five and six to determine which of the clusters offered the most opportunity for increasing fruit and vegetable sales to SNAP households, or food-insecure individuals generally (Tables 2 and 3).

Two of the food desert clusters, numbers two and six, had substantially more low-income and low-access individuals and the greatest number of households receiving SNAP benefits in Duval County. These clusters were selected as top priorities for programming as these communities offer the most potential for retaining SNAP benefits in the community through local fruit and vegetable

Figure 4. Seven Food Desert Clusters in Duval County, Florida, Showing Census Tracts with Contiguous Borders That Are Both Low Access and Low Income According to the Food Access Research Atlas

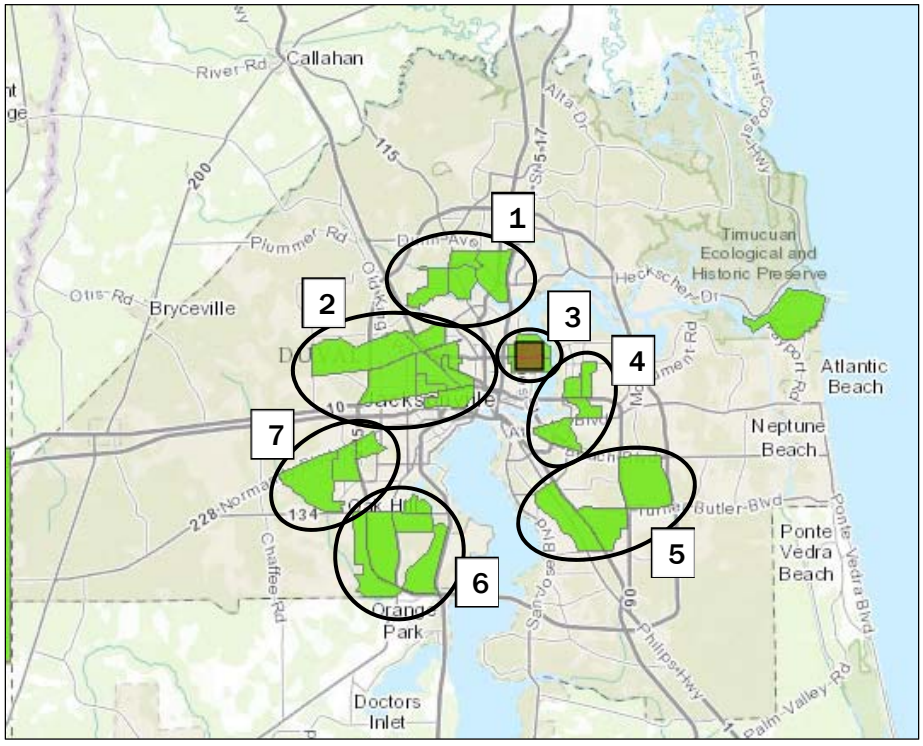


Table 2. Estimated Annual Amount of Fruits and Vegetables Purchased by Low-income (LI) and Low-access (LA) Individuals in Food Desert Clusters in Duval County, Florida, by Multiplying the Product (4) of the Total Number of Low-access and Low-income Individuals (2) and the Average Pounds of Fruits and Vegetables Purchased per Person per Week (3) by 52 Weeks and Dividing by 2,000 Pounds To Convert to Tons (5)

	(1) Total Cluster Population	(2) Total Individuals LI/LA	(3) Average Lbs. of F/V* Purchased per *Person* per Week	(4) Average Lbs. of F/V Purchased per LI & LA Persons in a *Cluster* per Week	(5) Average F/V Purchased by LI/LA Persons per Cluster per Year (in Tons)
Duval Cluster 1	15,210	2,645		39,336.44	1,022.75
Duval Cluster 2	31,995	7,478		111,212.82	2,891.53
Duval Cluster 3	4,901	1,886		28,048.59	729.26
Duval Cluster 4	15,013	1,385	14.872	20,597.72	535.54
Duval Cluster 5	23,901	2,986		44,407.79	111.02
Duval Cluster 6	35,419	6,405		95,255.16	2,476.63
Duval Cluster 7	13,629	2,529		37,611.29	977.89
Total				**376,470**	**8,745**

* F/V = Fruits and vegetables

Table 3. Estimated SNAP Benefits Received per Food Desert Cluster Identified in Duval County, Florida, Using Data from the 2008–2012 American Community Survey and the Supplemental Nutrition Assistance Program Data System by Multiplying the Product (Column 4) of the Average Monthly SNAP Benefits Received per Household in Duval County (Column 3) and the Number of SNAP Households (Column 2) by 12 Months (all in US$)

Cluster	(1) # SNAP Households	(2) Average Monthly SNAP Benefits Received per Household in Duval County	(3) SNAP Benefits Received per Month for Cluster	(4) Total SNAP Benefits Received per Year for Cluster
1	1,151		$162,889.52	$1,954,674.24
2	3,577		$506,181.27	$6,074,175.24
3	609		$86,185.68	$1,034,228.16
4	1,235	$141.52	$174,777.20	$2,097,326.40
5	1,213		$171,633.76	$2,059,605.12
6	2,725		$385,642.00	$4,627,704.00
7	968		$136,991.36	$1,643,896.32
Total	**11,478**	**$141.52**	**$1,624,300.79**	**$19,491,609.48**

purchases, thereby potentially reducing food insecurity in the region.

We used the same procedure described above to identify food desert clusters in St. Johns, Putnam, and Flagler counties as well. In total, we identified 29 census tracts as food deserts in Duval County making up seven clusters. There were five census tracts identified as food deserts in Putnam County that we split into two clusters. St. Johns County had seven census tracts we sorted into two clusters, and Clay County had only two census tracts forming a single food desert cluster. We have shared our findings with the rest of the project team and are in the process of forming a community action plan to reduce food insecurity in the identified clusters that includes programming that

will increase the availability of local fruits and vegetables in neighborhoods where the potential for SNAP spending is highest.

Discussion

Communities frequently develop unique methodologies for evaluating food-related aspects of the community that then require extensive time and resources (Van Hoesen et al., 2012). We developed this assessment procedure in response to the need for a standardized, rapid, low-cost approach to identifying the specific areas in a broad geographic region, such as a county, where interventions to reduce food security through increased purchasing of fresh fruits and vegetables by SNAP households would be most effective. Many nonprofit organizations and public agencies need to identify areas that have high potential for impact from interventions targeting food-insecure populations, particularly those receiving SNAP benefits. However, resources for needs assessments are often limited. Where budget and personnel are limited, a prolonged needs assessment process can deplete resources that could be better used to develop and implement interventions. The need for a reliable way to conduct a rapid needs assessment that provides at least initial guidance about where interventions are most urgently needed and most likely to alleviate food insecurity motivated the development of this assessment procedure. We also wanted a procedure that could be used in any region of the United States — that would not depend on state or local databases that may differ from place to place. Our assessment required only two days to complete and no expenses were incurred beyond that of the salaries to pay for the time of those who completed the procedure.

Household-level needs assessments provide the most detailed information about food insecurity and can include information about food preferences, cultural norms that affect food consumption, and household differences (both within and between) in access to food and food consumption. We are not suggesting that this assessment procedure replicates the kind of information that a more traditional household-level "on the ground" assessment would provide. However, there are limitations in conducting household-level surveys. A needs assessment based on household-level data can take weeks or even months to complete and requires trained data collectors, transportation, and in some cases assistance with statistical or GIS data analysis (Liese et al., 2007; Pothukuchi, 2004). Project collaborators need to consider whether the added detail and quality of the data are (1) critical to project implementation and potential success, and (2) justify the expenditure of human and fiscal resources needed to conduct them. Where resources are limited and/or time is of the essence, we believe that this assessment offers a viable alternative and can be modified to meet specific project objectives. We would also suggest that once a project is implemented and project personnel begin their work with members of the food-insecure community, the kind of data typically generated by a household survey can be collected as a part of ongoing project activities. Using a similar process, Baltimore used the results of multiple smaller community food assessments to develop citywide goals and objectives that created the job description for a new food policy director (Santo, Yong, & Palmer, 2014).

Depending on specific project objectives, we also suggest that project personnel use additional data sources to supplement the insights provided through this assessment. For example, the USDA ERS has many data sources that provide information regarding community food availability and federal food assistance programs at the census-tract level, such as the Food Environment Atlas[1] or the Supplemental Nutrition Assistance Program (SNAP) Data System.[2] Both of these resources function similarly to the FARA utilized in this assessment but offer different types of data. The Food Environment Atlas consolidates data on food choices, health and well-being, and community characteristics that could influence the food environment (USDA, ERS, n.d.-b). This assessment uses one piece of data from the SNAP Data

[1] http://www.ers.usda.gov/data-products/food-environment-atlas.aspx

[2] http://www.ers.usda.gov/data-products/supplemental-nutrition-assistance-program-%28snap%29-data-system.aspx

System, but the SNAP system also includes information on SNAP participation and benefits, poverty, and other socioeconomic indicators (USDA, ERS, n.d.-c). These can be used in conjunction with our rapid reconnaissance approach to refine and improve planned interventions. Other potential data sources include the U.S. Census Bureau, U.S. Census of Agriculture, state departments of agriculture, Kids Count Data Center, and USDA's National Farmers Market Directory. In short, for many project planners our assessment procedure can provide the information needed to get a project started, but should not be seen as the sole approach to data collection that the project may choose to use.

We anticipate that many communities will elect to expand on this assessment and complete more detailed and focused research in which they collect original data as a project evolves, which could include interviewing key stakeholders, facilitating focus groups of community members, or collecting additional quantitative data. There are a number of existing instruments and guides (discussed above) that we would suggest using to complement this initial rapid reconnaissance of food needs before spending time and money developing original instruments. The developers of many of these existing rapid assessment approaches recommend using the technique for initial exploratory purposes to develop project goals and then advise users to build on the results of the assessment using more in-depth research methods appropriate for the project.

Limitations

This assessment procedure is based on utilizing existing data resources, which can be an advantage for community organizations with limited resources but also poses some limitations. Communities may face challenges because the assessment is dependent on existing resources. For example, organizations may not always be able to access the specific data of interest at the level of measurement they desire if they depend only on available data, which may create weaknesses in the assessment depending on the degree to which data are extrapolated. It is also possible that because data is typically only available at the census tract or broader that the variance within census tracts is overlooked. For example, one of the poorest neighborhoods suffering from severe food insecurity could be located in the same census tract as a very wealthy neighborhood, and thus this census tract may not be identified using resources such as the FARA.

Project teams also do not have control over the quality of data when relying on existing data sources (Leitmann, 1994). Organizations should look for data from credible research institutions and that include a detailed methodology section to ensure the data are valid. Many publically available databases exist, and we encourage users to identify the datasets that work best for their specific project objectives. This assessment procedure is also limited in that some data are not collected frequently and available data might be outdated. For example, the purchasing data used in step six are based on sales in 2006. In light of population growth and the significant increase in the number of people receiving SNAP benefits, these data should provide some helpful information, but should be used with caution given changes over time.

In general, step six is not highly accurate. Use the estimates with caution as a guide for planning, not as accurate predictors of food purchases. This assessment procedure does not take into consideration the buying habits of individuals who actually live in the food desert areas, who may have limited access to food at the cost levels displayed in the study from which we drew our estimate of purchasing behaviors.

Estimates of quantities of food purchased may be useful in strategic planning for determining a distribution or sales plan when considered in conjunction with other demographic information. The results of this step in the assessment are probably best used when they are tied to a comparison of the potential production of fruits and vegetables in the county.

Conclusion

Local agencies and organizations are routinely expected to do more with fewer resources. Community food systems planning is a relatively new program area in many counties and often requires learning about a complex community issue that

affects populations that service providers have not traditionally served. Needs assessments are useful tools for identifying communities dealing with specific food issues and exploring the nature and extent of the problem. However, needs assessments can be time- and labor-intensive because project teams must collect original data. They also require expertise in social research methods and data analysis. The proposed assessment procedure included in this article will not provide the level of detail or depth of understanding gained when collecting original data using the USDA Toolkit or other resources available, but it also does not demand extensive time and cost from project collaborators. This assessment can be used to assist community food systems project teams in identifying the areas in the community that have the most potential for impact, for example, establishing a mobile market in the food desert cluster with the highest number of households receiving SNAP benefits to capture that market and keep the value of the SNAP benefits circulating in the community. There are many other data sources not discussed in this assessment procedure that may also offer service providers relevant information that can be used for planning purposes. We encourage users to modify this procedure to meet their community's needs and interests and to explore the existing data resources available in order to reduce the amount of effort expended developing research instruments, collecting data, and analyzing results.

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