

## Theme Overview: Developing Local Food Systems in the South

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*JEL Classifications: Q10, Q13, Q18, Q19*

*Keywords: Consumer Demand, Local Foods, Market Supply Chain, Risk Management*

Local foods and local food systems (LFS) have garnered much attention in the recent past, including in a previous issue of *Choices* with a theme entitled “Local Food—Perceptions, Prospects, and Policies.” Acknowledging that local food systems have developed at varying rates dependent upon regional differences across the United States, the Southern Experiment station directors and Extension directors commissioned a concerted effort to develop meaningful collaborations among Southern land grant faculty. The South has the largest numbers of historically underserved producers and small farmers in the United States. Given the South’s traditionally rural character and generally lower incomes than other regions of the United States, a number of challenges must be addressed.

The Southern Risk Management Education Center (SRMEC) identified the top 10 LFS opportunities, as identified by state workshop representatives sent by 1862 and 1890 LGUs. These research and extension priorities will guide future program needs and collaborative opportunities.

This issue of *Choice* identifies the five most important issues related to Local Food System development in the South as identified by agricultural economists. The first article, “Risk Management Issues within Local Food Systems” by Kenesha Reynolds-Allie, Deacue Fields, and Ron Rainey, lays out the primary areas of risk management for all producers, but importantly frames risk management in terms of how different types and sizes of producers are availing themselves of a variety of approaches in each area.

Marco A. Palma, Kim Morgan, Timothy Woods and Sean McCoy discuss general concepts in consumer demand

### Articles in this Theme:

**Risk Management Issues for Small Farms within Local Food Systems**

**Response of Land Grant Universities to the Increase in Consumer Demand for Local Foods in the South**

**Local Food Systems Markets and Supply Chains**

**Food Safety Policies and Implications for Local Food Systems**

**Local Food Systems in the South: A Call for a Collaborative Approach to Assessment**

that are critical to local food systems. They identify current trends impacting this sector and how producers may be best positioned for local foods demand. Article three, “Local Food Systems Markets and Supply Chains” by Timothy Woods, Margarita M. Velandia, Rodney B. Holcomb, Rebecca Dunning and Eric Bendfeldt, highlights unique attributes of local food supply chains, focusing on aggregation and distribution and the operation of food hubs as LFS market supply chains.

The fourth article, by Rodney B. Holcomb, Marco A. Palma, and Margarita M. Velandia, addresses food safety issues facing local food suppliers as they evaluate marketing options. In “Food Safety Policies and Implications for Local Food Systems”, the authors examine recently enacted food safety legislation and international movements

towards food safety verification throughout the food industry. In article five, “Local Food Systems: A Collaborative Approach to Assessment and Common Metrics”, by Dave Lamie, Rebecca Dunning, Eric Bendfeldt, Johanna Lelekacs, Margarita M. Velandia and Lee Meyer, contend that communities can achieve a broad range of various benefits by adopting strategies that encourage success of local food systems. In addition, they assert that collaborative and systems-based approaches which utilize a set of research-based tools and common metrics, increases the likelihood that such broad-based outcomes occur.

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# Risk Management Issues for Small Farms within Local Food Systems

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*JEL Classifications: Q13, Q14*

*Keywords: Local Food Systems, Risk, Risk Management Strategies, Small Farmers, Specialty Crops*

Recently, there has been substantial growth in the United States' local food system (LFS). Data from the 2002 and 2007 Census of Agriculture indicated a 17% increase in the number of farms selling directly to consumers, from 116,733 to 136,817 (U.S. Department of Agriculture (USDA) National Agricultural Statistics Service (NASS), 2007). Nationally, small farms—defined as those with less than \$250,000 in annual sales—accounted for 57% of direct-to-consumer sales. Based on the 2007 census, farms with less than 100 acres accounted for approximately 44%—\$528 million—of direct-to-consumer sales. This suggests smaller producers are actively participating in local food systems, and it raises questions about potential growth opportunities for small farms in those systems. To successfully capitalize on these opportunities, farmers must first fully understand the types of risks—production, marketing, financial, legal, and human—that threaten their farming operations in order to implement the appropriate strategies to mitigate risks' impacts.

This article focuses on relatively small operations in the LFS primarily because of their limited adoption and implementation of existing risk management strategies given the challenges they face to be profitable. Farms with greater access to resources are better capable of adopting and implementing current risk management strategies and using existing tools in their operations. Because smaller farms account for a significant portion of total farms involved in the local food system, it is essential to address their risk management needs to strengthen the system. We recognize that there are a host of risk management options available; however, the purpose of this article is to highlight and provide an overview of risks faced by small farmers as well as

discuss some of the most successful strategies available to manage risks among those interested and engaged in serving local food systems.

## Risk Management

Risk is prevalent in agriculture and despite widespread use of risk management strategies there is need for continued outreach and research to further mitigate its effects (Hardaker, et al. 2004). Risk management deals with selecting the appropriate mix of alternative strategies to reduce risks within the farm's operation, transfer risks from the operation to others more capable of handling risk exposure, or build the operation's capacity to bear risks (Harwood, et al. 1999). The article addresses five prominent areas of risks: production, marketing, financial, legal, and human risks (RMA 1997). While there is no single best risk management strategy for an operation, some strategies are more appropriate and cost-effective for relatively smaller producers participating in the local food systems.

**Production Risk:** Production risk involves all activities that affect the quantity and quality of production, including the effects of weather, pest, diseases, and other factors. The effects of weather, pests, and diseases on production have been discussed for years (Schickele, 1949; Hansen, et al. 1999; Collier, et al. 2008); risk management strategies to deal with such risks range from diversifying crops to adopting new technology. More recently, there has been an increase in the use of cost-effective strategies to reduce production risks that are more appropriate for local producers. These strategies primarily involve season extension technology for crop production and the use of crop insurance.

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Season extending strategies are ideal for local producers who must supply fresh, high quality produce on a consistent basis. Season extending technologies used by local producers include mulches, row covers, low and high tunnels, and greenhouses. Although all techniques are used for the same purpose, the technologies offer varying degrees of risk mitigation. Currently, the high tunnel is a popular strategy because of cost and returns as well as the flexibility to produce diverse crops for extended periods. A high tunnel is a polyethylene-covered structure with relatively low input for environmental control. The cost and returns of a high tunnel structure are determined by several factors including its size, type of crops grown and variable costs—plants, fertilizer, and irrigation, among others. Budgets are used to evaluate the profitability of these structures for various crops.

Acquiring crop insurance is another method of controlling production risks. The government provides federally subsidized insurance for specialty crops—which includes fruits and vegetables, tree nuts, dried fruits, and horticulture and nursery crops—managed and administered by USDA Risk Management Agency. However, these particular crops represent a relatively small percentage of the total liability coverage of insured crops in the U.S. Relatively lower production volumes and production of a vastly diversified crop mix creates a hurdle for small-sized operations to effectively utilize specialty crop insurance. One product suitable for highly diversified specialty-crop farmers of varying sizes is whole-farm revenue insurance. There are two types of whole-farm revenue insurance, Adjusted Gross Revenue (AGR) and AGR-Lite, available for this group of farmers.

**Marketing Risk:** Marketing is a vital part of the farming operation that transforms production into financial success. Therefore, selecting the appropriate marketing channel

is essential as this will have a tremendous impact on the farm's profitability. Although there are a wide variety of marketing outlets available for LFS marketers, the options available for the relatively smaller farms are limited. For instance, small producers may not be able to utilize wholesale outlets or some intermediate outlets due to the volume of products required or processing and packaging specifications. As a result, relatively smaller producers typically utilize direct-to-consumer markets. Direct-to-consumer markets have experienced rapid growth in recent years. Increasing numbers of intermediate outlets—restaurants, grocery stores, and regional distributors—are also demanding more local food. While many mid-sized and large-scale producers are creating innovative strategies to capture this market, many small producers struggle to find consistent success. Access to infrastructure, particularly aggregation and processing facilities, could bridge the gap between small producers and these larger markets. Expanding the infrastructure capacity for delivering products through local food systems would provide smaller producers a stable and more consistent market and could serve as an effective marketing risk management strategy.

Recently, there has been an increase in the number of aggregated infrastructures, more specifically food hubs. A food hub is a business or organization that actively coordinates aggregation, storage, distribution, and marketing of locally or regionally produced food to strengthen small producers' abilities to satisfy wholesale, retail, and institutional demands (Matson and Thayer, 2013). By aggregating the products of many individual farmers and providing economies of scale, food hubs help small producers reach a wider range of markets, including large regional buyers. Based on the USDA Agricultural Marketing Service (AMS) working list of food hubs, there are a total

of 237 across the United States as of July 1, 2013.

**Financial Risk:** Financial risk covers any risks that directly threaten the farm's financial health. One source of financial risk that is common among small producers is the cost and availability of financing options, capital loans, and operating loans. Unlike smaller producers, larger farmers are usually more likely to possess collateral, and required detailed financial and performance records lending institutions need to evaluate their credit risk. Additionally, the process and cost of obtaining a loan are relatively higher for small farmers, which present an application hurdle. Another hurdle is the limited capacity for financial institutions to evaluate the repayment capacity of these small, diversified, niche market operations. Recent benchmark studies have aided financial institutions' understanding of small, diversified operations but expertise is still somewhat limited. Although financing options are limited, it is important for local producers to understand the options available and their requirements to be able to select the best fit for their farm and their financial capabilities.

Loans offered by commercial banks and financial institutions include funds for financing crop and livestock production expenses, purchasing equipment, purchasing land for the purpose of farming, as well as for breeding livestock. Many commercial banks also participate in USDA Farm Service Agency (FSA) guaranteed loan programs, providing additional opportunities for making and servicing agricultural loans. FSA recently began offering a micro-loan program—direct farm operating loans with shortened applications and reduced paperwork designed to meet the needs of smaller growers.

**Legal Risk:** Legal risks result from uncertainties that threaten the legal standing of the farm or put the farmer in legal jeopardy. Local producers

should implement risk management strategies to reduce the number of potential legal disputes, or reduce or transfer the costs associated with these risks. Legal implications can arise from many sources but three main areas involve labor issues, market contracts, and food safety issues.

Because of the labor-intensive nature of agriculture, the U.S. Department of Labor (DOL) has several labor laws to protect employees. Common requirements include registering with DOL, ensuring no illegal alien is employed by the operation, keeping detailed up-to-date records for each employee, visibly displaying posters of specific Acts or laws for all employees, and providing each employee written documents detailing all conditions of employment.

An increasingly important aspect of agricultural production and marketing that can serve as a risk management strategy is the use of contracts. Production and marketing contracts provide several benefits to small producers including access to technology, a guaranteed market, and a more stable income. However, the language of the contract, legal issues and obligations established, and the nature of the relationship created between the producer and the contractor or buyer determines the risk strategy of the contract; risk sharing or risk shifting. Therefore, it is essential for producers to carefully assess the terms of a contract before signing, and once signed, they must adhere to the terms to avoid legal ramifications.

Compliance with good agricultural practices (GAP) and food safety laws is crucial to reducing legal risk related to consumers. The recently passed Food Safety Modernization Act (FSMA) elevated food safety processes from an industry standard to regulatory compliance. At writing of this article, the final regulations are still being finalized. While the new law contains exemptions for “small” farmers, FSMA will

require heightened scrutiny and documentation in the local food system environments.

Use of insurance products is a basic strategy for farmers to transfer or limit risk exposure. Therefore, it is important for producers to maintain adequate liability insurance for their businesses. Typically, local producers are required to have a minimum of \$1 million of product liability coverage, which is a prerequisite to sell to intermediate markets. Insurance considerations are a critical area for LFS farmers to consider given their exposure to many buyers.

Human risk: Labor makes up the largest cost associated with producing and harvesting most agricultural crops and accounts for about 50% of the food marketing bill (Fields, 2008). As a result, finding ways to reduce labor costs are an ongoing challenge for producers. Hired farmworkers play an integral role in U.S. agriculture, although there has been a steady decline over the last decade, from about 3.4 million to just over 1 million jobs—including part-time and full-time (USDA/NASS, 2007). Farm Labor Survey statistics show that a majority of farmworkers are found on the largest farms, with sales over \$500,000 per year. Both the quantity and quality of available labor are two significant human risk issues for small producers in the local food system. Given the relatively increased incidence of hand-harvested specialty crops being marketed through these local systems, attention to labor management becomes critical to small growers who want to access these markets effectively.

The shortage of skilled labor is forcing producers of all sizes to explore creative ways to secure quality labor but, given their resource constraints, this issue is magnified for small farmers. Based on a case study conducted in California, farmers often use other methods beyond compensation to enhance employee

satisfaction and productivity including respect and recognition (National Center for Appropriate Technology & California Institute for Rural Studies, 2010). This requires effective communication and building relationships with employees to understand their motivations and then finding appropriate compensation that result in increased employee and operational efficiencies. Applying this strategy to small farms could reduce the costs associated with labor.

## Implications

The number of small farms participating in the LFS is steadily increasing. However, these producers continue to encounter business uncertainties and risk management issues that are difficult to overcome given their size and financial capabilities. Thus, continued research and extension efforts to develop innovative, cost-effective risk management strategies applicable for small-sized operations could further aid expansion of local food systems. Although some financial benchmark studies have been done on different risk management areas, very little has taken different scales of operations into consideration and especially so for smaller operations. Hence, the need to continuously explore and evaluate different strategies to successfully finance producers focused on serving LFS to aid this growing segment of the market. Additional advances in acceptable protocols for transparent effective food safety systems would aid both grower and consumer food safety concerns. Expanded public and private partnerships to facilitate the development of infrastructure must be created to alleviate a number of the supply chain and efficiency questions that stymie growth in these local systems.

These partnerships can leverage some of the available grant programs—such as value added producer grants, and the USDA Specialty

Crop Block Grants to the states the Sustainable Agriculture Research and Education and Extension Risk Management Education grants program—to enhance the development of these local food marketing outlets for small farmers.

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## Response of Land Grant Universities to the Increase in Consumer Demand for Local Foods in the South

Marco A Palma, Kim Morgan, Tim Woods, and Sean McCoy

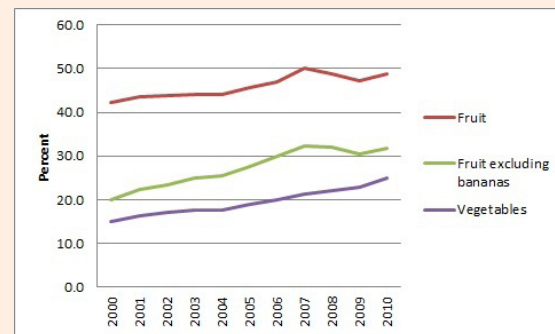
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*Keywords: Consumer Demand, Local Food Systems, State Promotion Programs.*

Local food systems (LFS) are attracting attention from producers and food retailers as consumer concerns and interests about the origin of food continue to rise. There is a rapidly growing body of academic and popular press literature related to the demand for local food with important implications for participants of local food systems. The increased popularity of local food is linked with a subculture rooted in a preference for domestic products, increasing consumer concerns about food safety and sustainability, climate change and associated transportation costs and perceptions of higher quality (Onozaka and Thilmany, 2011). Particular attention has been given lately to the concept of regional food hubs or entities that seek, aggregate, distribute and market food products with a local origin. It is important to note that currently, there is no legal or universally accepted definition for local foods, and the notion of “local” has different connotations for different people, ranging from proximity to the production site, to within a county, State or even national boundary. Even without a clear definition, consumers place higher value on locally produced food compared to other sources (Onozaka and Thilmany, 2011; and Darby et al., 2008).

However, it must be noted that despite the local food movement, domestically grown food share is decreasing, and U.S. consumers are becoming more dependent on imported food sources as shown in Figure 1 (Palma, Ribera, and Bessler, 2013). The share of U.S. fresh fruit consumption derived from imports increased from 42.4% in 2000 to 48.6% in 2011. Excluding bananas, the share of U.S. fruit consumption derived from imports increased from 20.1% in 2000 to 32.1% in 2011 (U.S. Department of Agriculture (USDA), 2012a) and vegetable consumption

**Figure 1:** Share of U.S. Fresh Fruit and Vegetable Consumption Derived from Imports 2000-2010.



Source: USDA-ERS.

derived from imports increased from 15.1% in 2000 to 25.7% in 2011 (USDA, 2012b).

Farmers’ markets are a significant outlet for locally grown food products. Of products sold in farmers’ markets located in the Southeast and in the Southwest, nearly 91% and 81%, respectively, are labeled as locally grown (Ragland and Tropp, 2009). The predominant food category sold in farmers markets is fresh fruits and vegetables. The value of agricultural products sold directly for human consumption, e.g., at farmers markets, farm stands, and roadside stands, increased 49.1% from \$812 million in 2002 to \$1.2 billion in 2007 (US Census of Agriculture 2007). However, U.S. agriculture has experienced a similar growth rate during that period. Direct marketing sales as a percentage of total value of US agriculture remained almost the same from 2002-2007 at 0.4%.

Most farms selling directly to consumers are small farms with average annual sales of \$8,853 and which tend to rely on direct-to-consumer sales. In 2007, about 78.1% of farms in the United States reported sales of less than \$50,000; however, these farms accounted for just 3.9% of total agricultural sales (U.S. Census of Agriculture, 2007). While the South has a large number of small farms, the share of those farms engaged in direct to consumer sales is very low with 3.8 and 4.9 percent in the Southwest and Southeast respectively (Ahearn and Sterns, 2013). It is unclear at this point what the role of small or medium-size farmers would be in satisfying the demand for local products or whether large farmers will continue to penetrate the local food market as consumer demand increases. There are many factors that may impact the ability of small farmers to satisfy, at least in part, the demand for local food. Some of the factors identified in the literature include: (1) an array of free trade agreements covering most North and South American countries that facilitated fresh produce access to U.S. markets; (2) dietary guidelines; (3) consumer health concerns; (4) Food Safety Modernization Act (FSMA); (5) trade practices of wholesalers, brokers and supermarkets; (6) lengthening marketing season; (7) direct marketing, organics, and local foods; (8) technological changes; (9) immigration policies; (10) food prices and income distribution; and (11) food security and food programs.

The ability of small farmers and local food systems to improve their contribution to the food supply chain is contingent upon the capacity of producers to compete successfully in a global food system with increased competition and increased regulations. This presents challenges and opportunities for local food systems. Southern land grant universities (LGU) are uniquely positioned to collaborate with a wide range of stakeholders in integrating the efforts

to help develop local food systems in the South. In this article, we reflect on trends for local food demand, review existing resources, identify opportunities for collaboration, data and resource gaps and needs, and explore the role of LGUs, particularly in the South.

### **Where Do We Stand?**

LGUs across the South recognize the increasing importance of local food systems regionally and are exploring research and educational support to meet the growing consumer and producer support. These LGUs have worked both individually and collaboratively to develop research, information, and programs meant to establish viable local food systems in their states. Although each state is unique, nearly all existing programs and research efforts have the same goal: to evaluate and identify local food system needs and opportunities. Currently, parties interested in developing local food systems have at their disposal tools such as wholesale market preparedness trainings for farmers as well as consumer demand studies of local foods and assessments of state marketing programs.

Southern land grant universities' Extension and outreach programs remain an important resource for local producers. Research pertaining to consumer demand of local foods in the South focuses on statewide economic impact studies and the efficacy of statewide branding and promotional campaigns. Current projects within Southern LGUs include: expanding local food direct market opportunities, farm-to-school projects, outreach targeted to small farmers and alternative enterprises, and support and education specific to farmer's markets. Individual states are active in programs such as: state and national food MarketMaker portals to connect farmers with buyers, price reporting for farmers' markets and local food hubs, statewide local food

systems' advisory boards, and a local food systems certificate for students.

In addition to Southern land grant universities, local food systems in the South and Southern agriculture are the primary foci of several stakeholders, including governmental agencies, private sector groups and non-governmental organizations (NGO), and consumers. Many LGUs in the South are providing support to state departments of agriculture to promote State programs for buying local. NGOs involved in local food systems research and resource development include Southern Sustainable Agriculture Working Group (SSAWG), and Southern Sustainable Agriculture Research and Education Program (SARE). Both organizations have been instrumental in developing current resources, public and private, for those interested in any segment of the existing local food system, ranging from production to marketing and distribution. SARE and SSAWG actively collaborate with many Southern region land grant universities on local food concerns. Local chapters of select organizations, such as Slow Food USA and Farm Bureau, often provide valuable support to local distribution infrastructure and locally focused production and marketing strategies. Governmental agencies currently involved in the research and development of local food systems are USDA Economic Research Service (ERS), USDA Agricultural Marketing Service (AMS) and local state departments of agriculture, among others.

As interest in local food systems across the South continues to build, additional research and extension efforts coordinated by Southern LGUs and other interested organizations is expected to continue. Further examination of local foods systems in the South will supplement existing information to provide a better understanding of the challenges and opportunities that are available for



participation of Southern LGUs.

### **Who Are the Stakeholders?**

Many producer groups, consumer groups, government agencies, and food-related sectors exhibit growing interest in better understanding the dynamics of local food demand. This provides a rich area for research collaboration among Southern LGUs and regional partners. Value chain partners, such as input suppliers, producers, wholesalers, grocers, restaurants, farm-to-school partners, community supported agriculture (CSA), and farm market groups, are interested in consumer-oriented responsive producers and efficient delivery of local food products. Public agencies and consumer advocacy groups are concerned about economic development outcomes that arise from clear recognition of consumer demand within specific groups of consumers, for example, low income access, health and wellness, and local ethnic groups. Public agencies that provide infrastructure, education, and promotion have a strong interest in understanding consumer demand for local food products.

The LGUs have regularly partnered with producer and food business groups to help identify and determine local food demand. Private market research firms have contributed significantly to consumer awareness of local food and have a ready audience within the retail food sector. Smaller-scale producer groups that are typical of many local food systems, which emphasize local products to local markets exposed to localized consumer interest segments, may not have the capacity or funds to address specific research questions.

There is a distinct role for the land grant-based scientist to serve these groups and perhaps an opportunity to collaborate with private research firms and local food supply chain members and stakeholders to fill in knowledge gaps. There are certain economies of

scale to market research, but these are tied to diverse consumer groups across locations. Consumer demand for local food products in Texas is expected to be different from that of Michigan, for example. Local food is, by definition, distinctive, both in products and experience.

There are further opportunities for research collaboration regionally across LGUs. Part of this can be to harmonize data collection, producer and consumer survey methods, and outreach evaluation metrics. There are also collaborative opportunities across disciplines within the university community. Many disciplines have some stake in the research questions related to consumer interests in local food including, for example, medicine and public health; rural sociology; education; and production, marketing and economic scientists.

Extension education is at the core of LGUs' missions. There is an opportunity to collaborate to provide local food producer education with marketing and business planning tools that integrates local demand research from farm to table. Effective Extension programs are research-based; opportunity exists to extend objective research findings to producers, producer groups, and the full spectrum of stakeholders and agencies affiliated with local food systems.

### **Filling the Gap**

Consumer demand for local foods purchased within shortened marketing and distribution channels is on the rise (Onozaka and Thilmany, 2011; and Darby et al., 2008). Objective information specific to consumer demand for locally sourced food must be shared with growers who are exploring long-term investment in year-round production and marketing of meats, dairy, grains, seafood, and produce. This information will help producers make better planning decisions in their marketing process to bring their products

to market and possibly identifying new markets. Specific consumer demographic information related to wealth, geographic distribution, and health data are needed to target specific food products in appropriate market segments. Among the segments of the population which are in the greatest need to improve nutrition are those living with poverty and those lacking ready access to nutritious, local food, sometimes referred to as "food deserts." Many consumers in food deserts receive assistance from food programs such as the Supplemental Nutrition Assistance Program (SNAP). However, food assistance usage in the South appears relatively low compared to other regions in terms of poverty rates, possibly due to availability or limited public transportation options. One way to improve availability of food is with mobile food distribution partnerships. As restaurants continue to prioritize local foods on their menus, food distribution companies are interested in sourcing product from nearby food hubs or cooperative food sheds, motivating production capacity assessments along their routes. State, regional, and local level food policies and legislation vary markedly. Hence, market analyses would be beneficial to policymakers and regulators for integrating data on existing regulations, community resources, employment, population, farm land acreage and quality, public food programs and food consumption patterns, private food retailers, network connectivity, and so on.

Market situation and outlook analysis is limited in both historic longevity and scope. Current budget constraints have reduced the availability of objective farm gate and retail prices from sources such as USDA-AMS. Another pressing data need is price information from growers' sales via community supported agricultural share arrangements, farmers' markets and roadside or on-farm sales, food hubs, and direct to retail such

as local grocers, restaurants, convenience stores, and public institutions.

Rebuilding regional food systems requires modern approaches and solutions to moving food from farm gate to consumer table. Consumers make food purchasing decisions based on many credence and value attributes that are not always recognized by farmers. Consumers attach a myriad of social, behavioral, physical, emotional, environmental, legal, moral, and financial values to nearly every food and drink purchase and consumption decision.

Producer decisions to market directly to consumers are certainly influenced by prices consumers are willing to pay for the added value of the locally grown, differentiated products; however, knowledge about their sensitivity to current prices and potential variability of future prices is needed. Consumer demand at a specific marketplace and market day are motivated by buyer preferences and product availability, information that varies widely across geographic and demographic characteristics. By definition, differentiated marketing channels originate from grower-consumer relationships that cannot be easily duplicated or replaced over the medium- to long-term. However, with a lack of an unambiguous definition for the “locally-sourced” food attribute, there are information asymmetries related to accurate packaging and labeling.

Research questions related to consumer behavior and local food purchase choices merit further evaluation. Other opportunities exist to better understand consumer choices around local food options and health and wellness behaviors. The success of CSA vouchers in Wisconsin distributed through regional health and wellness programs suggests promising linkages, but further longitudinal data is needed, including programs targeting distribution to lower-income communities (Woods, 2013).

To continue developing and maintaining objective, science-based stakeholder programming, there is a need for improved interaction and collaboration among LGUs and local government, grassroots, non-profit associations, consumer advocacy groups, and others keen to impact local food systems. Traditional information delivery methods are challenged to connect rapidly and produce results on-demand, ignoring geographic boundaries that embrace the food system’s economic actors. Reducing impediments to functional and economical networking among land-grant systems can lead to successful leveraging of available time, money, and personnel resources and result in targeted delivery results.

### Initial Steps Forward

Growing efforts are placed on understanding consumer trends related to local foods. Such trends, however, are inherently localized and difficult to generalize over broad geographies, market channels, or products. LGUs are in a unique position to assist with consumer demand evaluation for local food, not only because they are connected to local food production as part of their mission, but because they are connected to other local agencies and other land grant institutions. Although meaningful new observations are becoming available based on national-level research, the information gaps are local. Who are the consumers? What are they valuing in local products? What is the experiential dimension? How do consumers search for local products? What are the substitutes and complements for local products? How does demand differ by market channel?

There are practical steps forward for land grant programs to help fill information gaps through local consumer research and also help integrate these findings into Extension programs designed to help producers in local markets with business

planning and market development. State departments of agriculture with considerable investments in “Buy Local” programs share interest in understanding consumer dynamics as they develop branding strategies. Better local demand measurement will help agencies determine better approaches for public investments. As more consumer scientists engage in demand dynamics and consumer behavior issues nationally, there will be more opportunity to adapt analytical tools and data to local contexts.

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## Local Food Systems Markets and Supply Chains

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*JEL Classifications: L110, O430, Q130*

*Keywords: Distribution, Local Food Systems, Supply Chains*

Interest has increased in locally grown food (LGF), but the product definition has remained, understandably, rather vague. U.S. Congress defined a locally grown food product as a product sold within 400 miles of its origin, or within the state of its origin (Hand and Martinez, 2010), but in practice the concept varies widely both by product and region. Supermarket retailers, seeking to establish their own merchandising standards, have adopted their own definition of LGF. Definitions continue to vary widely across retailers and consumers, and can include a variety of values-based characteristics in addition to geographic proximity. Wal-Mart, for example, defines local produce as produce sold within the state in which it was grown in contrast to Earth Fare's definition as no further than 100 miles away from an Earth Fare store (Clifford, 2010; and Earth Fare, 2013). Supermarkets across the United States, including the South, recognize the increasing interest in LGF and have tried to capitalize with their own "buy local" programs. Consumer and retailer interests are further bolstered by state-funded programs which support and develop markets for state-grown products. State branding programs are widely used across the South.

Coordinating marketing functions with production represents one of the greatest challenges for local food, particularly concerning efficiently managing distribution and promotion. Mansfield and others (2003) noted the substantial level of public investment in physical marketing infrastructure put in place across the South, primarily for aggregation and distribution. Such public investments can perhaps be considered as regional efforts to improve supply coordination, but more localized private networks are also emerging. Business and market structures are rapidly

changing all along the local food supply chain, with farmers' markets, community supported agriculture (CSAs), food hubs, and other business models evolving across the South in an effort to shorten the food supply chain and increase LGF supply and quality. These organizations and structures are a diverse combination of public and private initiative. Much of the business structure innovation involves collaboration and integration that is both horizontal (wider scope of products and aggregation for scale) and vertical (assuming more downstream supply-chain functions).

Technology is rapidly changing conventional food supply chains. Innovations are connected to traceability, distribution efficiency, quality assurances, market information management, and product development, while larger-volume supply chains are implementing other technology-centered changes. These innovations are also being adapted to smaller-scale, shorter, localized food chains. There are interesting cases, particularly among some of the food hubs, where the supply chain information technology (IT) solutions were developed specifically to meet unique and

Region	No. of Food Hubs	% of total
Southeast	64	27%
Southwest	16	7%
Northeast	63	27%
Midwest	50	21%
West	42	18%

Source: Barham et al, 2012, National Food Hub Resource Guide, National Good Food Network

specific needs of the group (Barham et al., p.13, 2012; and Matteson and Hunt, 2012). In some cases, LGF supply chains have become more integrated; in other cases, technology has contributed to the emergence of more specialized (local) chains.

### **Aggregation and Distribution Models for Local Food Systems**

There is much to learn about the many innovative supply chain systems related to LGF. A host of research questions is raised in light of the diversity of these short supply chain approaches that more directly link producers and consumers, including replicability. Relative costs associated with efficiency are only part of the question. Economies of scale and standardization don't play the same role in markets where consumers are specifically looking for uniqueness and small size. Small- and mid-sized producers have taken advantage of the increased interest in LGFs mainly by forging direct-marketing channels to consumers, such as farmer's markets, roadside stands, and CSAs. Producers are also selling through intermediate marketing channels, such as sales to local retail, restaurant, and retail distribution outlets. Despite growth in consumer interest in geographic proximity of production, 97% of food still travels through conventional market structures (Low and Vogel, 2011) dominated by established and increasingly concentrated systems of nationally and globally organized wholesalers, processors, distributors, and retailers (Martinez, 2007). Small- and mid-sized producers' ability to access large wholesale and retail outlets through traditional supply chain systems given the volume, consistency, and quality requirements, as well as third-party liability insurance and food safety certification requisites demanded by these channels, remains limited.

Scale economies associated with distribution are significant and have been a major driver for food retailing

consolidation. Similar concentrations of distribution have occurred with food processing, particularly in meat and dairy products (James, Hendrickson, and Howard, 2013). Much of the smaller scale, local food production is disaggregated and not vertically integrated. Diminishing access to independent processors may be one barrier to LGF system growth. The ability to reach a larger share of consumers looking for LGF generally requires other business models to be considered by small- and mid-sized producers, and some interesting innovations have emerged that make short supply chain distribution more tractable. Season extending technologies and cooperative planning with a wholesale distributor looking to add a LGF line, for example, have the potential to expand the market presence of local produce

Local food system (LFS) supply chains place significant attention on preserving product identity throughout the supply chain, with the assumption that consumers will seek out and potentially pay more for foods that have a local identifier at point of sale. "Local" is inherently a positive credence attribute, but one that has been subject to ambiguous verification. Certifications and other tools used to authenticate products distributed through these channels have been explored, but are in their infancy. There has been growing interest in branding—state brands, regional brands, and farm-estate brands. Many retail outlets are trying to help consumers know where their food comes from by using producer profiles to more accurately identify locally grown products (e.g., a photo and short biography of the sweet corn producer at the point of sale). However, as product volumes increase and are derived from a greater number of local sources, accurately associating particular farmers with specific products may be more difficult and prove intractable as a long-term marketing strategy. There are clearly scale

diseconomies to local promotion providing an advantage to smaller locally based retailers.

### **Food Hubs as Supply Chain Solutions**

Food hubs have been explored as a business model allowing for small- and mid-sized producers to reach a large volume of consumers seeking locally grown foods (Barham et al., 2012; and Matson, Sullins, and Cook, 2013). These aggregation and distribution centers help address the scale efficiency and other supply chain disadvantages faced by smaller producers seeking to link with conventional retail and food service markets. The U.S. Department of Agriculture defines a food hub as "a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand" (Barham et al., 2012). There are six characteristics that define a food hub: 1) they organize aggregation, distribution, and marketing of mainly LGF from multiple producers to multiple markets; 2) they have a commitment to buy from small- and mid-sized local growers; 3) they work with producers to build their capacity to access wholesale and retail channels through facilitating their ability to meet requirements in these channels; 4) they try to guarantee good prices for their producers by using product differentiation market strategies; 5) they perceive producers as partners rather than suppliers; and 6) they want to have positive economic, social, and environmental impacts on the local communities while trying to maintain financial viability.

Food hubs can also address other challenges faced by small- and mid-sized agricultural producers. Undercapitalization and lack of access to capital to support marketing and

processing needs are major hindrances to the new breed of “retail agriculturists” seeking to reach new markets (Matteson and Hunt, 2012). Local food hubs can supply marketing services and processing infrastructure, as well as an opportunity to overcome food safety compliance issues and product liability concerns by providing group certifications or group insurance policies. They may also reduce market participation costs for small- and mid-sized producers, thereby attracting wholesalers to purchase local products from food hub participants as opposed to individual farmers.

Recent reports estimate that over 230 local food hubs are distributed across the nation (Barham, Tropp, and Dimitri, 2012). Although food hubs have been a marketing mechanism used with less intensity in Southeastern states when compare to the northeastern states, it is still widely used with 52 hubs across the Southeastern states. Evidence is mixed, however, in terms of demonstrated evidence of sustainable business models. Such food hub arrangements are structured to satisfy consumer demand for LGFs and illustrate how actors within the local food system supply chain are continuously searching for the most effective and efficient ways to do business. Public and private roles, business structures, grower involvement, and targeted consumer segments are being sorted out in different ways.

### **Public Agency Support for Local Food System Development**

Public agencies can provide research and training support to develop local food systems in many ways, such as supporting season-extending trials; estimating the feasibility of alternative processing and distribution networks; identifying ways to minimize food safety risks and reduce the costs of complying with food safety regulations; and identifying best management practices across market structures. Establishing public-private

partnerships that link retail and food service companies to producers and university research and Extension support could enable small-local and large-conventional distribution systems to be brought together to reach the shared objective of bringing locally grown foods to local consumers, such as with [ncgrowingtogether.org](http://ncgrowingtogether.org). Research can also identify supply chain innovations that appeal to and increase access to different consumer segments (e.g., “value shopper,” “foodie”), and evaluate the social, economic, and environmental externalities associated with new types of supply-chain relationships. Increased involvement in LFS of non-traditional and part-time producers, non-governmental organizations with urban renewal or other economic development objectives, and public agencies focused on outcomes such as employment can create further complexities around developing sustainable local food supply chains.

LFS supply chains must be examined as a network of strategic partners working locally on shared management issues. A two-part question needing to be answered is: Can strategic management in the food safety arena be adapted to local food systems in general, and can the idea of vertical strategic alliances be adapted to LFS supply chains? The local food supply chain need not be considered as separate local/non-local choice or even as a rival value chain. Indeed, the concept of supply chain management in food has always been about vertical partners working together to identify efficiencies and value creation through data, resources, and rules shared by the value chain. Both academics and food industry professionals have wrestled with ways to deal with markets and technological changes related to food supply chains. A rich tradition of supply chain research and management tools has emerged largely in the business literature, but also in the efficient consumer response practices in the

food industry with direct application to LFS organization and performance and therefore may be used to answer questions such as the one formulated above.

Adapting management information systems for marketing at a smaller scale, providing producer education on emerging buyer needs, and evaluating the feasibility of modern supply chain tools—including information exchange, quality assurance, and inventory management to short supply chains—are opportunities for developing LFS-focused education and capacity-building programs. Best practices templates for local food supply chains need to be assembled and shared among public agencies working with producers and other local food partners. Many LFS aggregation models have been explored to discover more cost-efficient distribution systems. Much work is needed to document LFS system cases, successes and failures, typologies, and planning- and concept-transfer tools for LFS development practitioners.

Marketing functions supporting local food need not be at odds with marketing functions supporting existing systems. Most local food will necessarily go through existing market channels; wholesalers, grocers, restaurants, and schools are willing partners with existing infrastructure. Public agency initiatives can work within the existing “conventional” food supply chain to identify solutions and opportunities for local foods.

### **Structure, Conduct, and Performance Revisited**

The history of industrial organization is characterized among academics by observations and theories about how firms and industries are organized. Economists within these traditions looked at the relationships between supply chain structures and industry concentration, rules and organizations, and, ultimately, their impact on performance. Earlier academics

focused on issues like market power and firm behavior, public goods, and market failure, and examined the linkages of how supply chains were organized to overall industry performance. The emergence of innovative supply chains connected to local food systems raises a need for both academics and food industry professionals to look more closely at the relationships between how supply chains are organized and consumers' various considerations of what constitutes a high performing food system. Consumers increasingly place a value on where their food comes from, creating an opportunity for certain producers to take advantage of segmented markets and differentiate their products. There are certainly many innovative supply-chain strategies, but performance—including outcomes impacting local producers and consumers looking for local products—needs to be carefully thought out, along with the identification of meaningful measures for all participants in the system. Producers need to be able to identify viable distribution strategies either through their own dedicated supply systems or in tandem with existing conventional distribution partners.

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## Food Safety Policies and Implications for Local Food Systems

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*Keywords: Food Marketing, Food Safety, Food Safety Modernization Act, Local Food Systems, Risk Analysis*

Local food systems have been on the rise during the past decade. Organizations known as “food hubs” actively manage the aggregation, distribution, and marketing of source-identified food products. Community supported agriculture (CSA) programs, in which a group of consumers commit to share the risks and benefits of food production with a grower, have become commonplace. Even prominent retailers have placed a greater emphasis on the marketing of “locally grown” food items. Public support for such systems has impacted both state and federal policies, including support for more farmers markets, farm-to-school (FTS) programs, and the development of the U.S. Department of Agriculture’s (USDA) broad-reaching “Know Your Farmer, Know Your Food” program. The growth of local food systems has not been confined to one region of the country, instead becoming a national trend.

Even with a growing national prominence, the relative niche status of local food systems has left them vulnerable to sweeping changes in the food industry as a whole. Recently enacted food safety policies such as the Food Safety Modernization Act (FSMA) and increased manufacturing and retail emphasis on the Global Food Safety Initiative (GFSI) compliance have left local food system participants unsure of the regulatory requirements for accessing various market channels and their liability exposure. Specifically, small producers participating in local food systems may be uncertain about the impact of new food safety regulatory frameworks on their cost structure, profitability, and market access (Martinez et al., 2010).

The 2011 FSMA represented the most extensive change in food safety regulations since the 1950s, but details for

most aspects of the act were—and still are—“to be determined.” In the two years since it was signed into law, several rules have been proposed and submitted to the public for comments (U.S. Department of Health and Human Services (HHS) and U.S. Food and Drug Administration (FDA), 2013c). As a result, the FSMA and its provisions have been greatly scrutinized and revised, including the definitions for small businesses and their exemptions from some of the more stringent aspects of the FSMA as proposed by the Tester-Hagan Amendment. The Tester-Hagan Amendment was developed to exempt small farms and food businesses from certain financially burdensome and report-intensive aspects of the FSMA on the presumption that short-chain traceability of local foods suppliers makes them safer—or at least have less risks of geographically distributed food-borne illness—than larger national and international food suppliers.

Small producers and food businesses are—for the moment, at least—defined as those that market more than 50% of their products directly to consumers, stores or restaurants, farmers markets, bake sales, public events, and fundraisers. Producers with less than \$500,000 in annual gross sales are also included in this category. Additional exemptions exist for those with less than \$25,000 in annual sales who sell to consumers, stores or restaurants in-state or within 275 miles from where the food was harvested or processed. The FDA estimated that approximately 76,000 farms fall into the small business category and about 34,000 more fall into the sales of \$25,000 or less category (HHS and FDA, 2013a), although the validity of these estimates is debatable.



Uncertainty and misconceptions about the proposed and final rulings on exemptions for small farms and food businesses are rampant, creating a range of concerns among small farms and food businesses about changes in food safety requirements and their ability to meet these requirements in a cost effective manner. As of the writing of this article, several aspects of the FSMA have not been finalized. For example, labeling approval and registration as a “food processing facility” may be necessary for small farms that engage in certain growing, harvesting, and packaging activities for commodities identified as high-risk foods. In addition to registration, some small farms/food businesses may have to submit hazard analysis and prevention control plans depending on the level of processing, packaging, or food holding activities they undertake.

Regardless of the exemptions, small farms/food businesses are still subject to lawsuits and inspection if their food items are contaminated and cause injury or harm to consumers.

Besides the FSMA, local food systems suppliers may also be subject to food safety and traceability requirements as they expand their marketing channels to include retail food outlets. Food processors, retailers, and foodservice entities have shown greater emphasis on the GFSI standards in recent years. The GFSI began in 2000 as an international food safety and traceability benchmarking effort by food industry leaders, but now promotes an internationally harmonized approach to food safety that emphasizes following one of a handful of food safety protocols. These internationally accepted protocols may be required for marketing products in certain retail chains, along with a checklist of other requirements and verifications. As examples of these other requirements, all suppliers to the Whole Foods chain must meet detailed standards that include acceptable and unacceptable ingredients;

storage and handling of products; and welfare standards for livestock for meat, poultry, eggs, and dairy products. Wal-Mart recently announced corporate-wide efforts to have fresh produce suppliers follow the Produce Traceability Initiative (PTI) protocol and institute a “100% money back” guarantee on freshness by 2014, with no mention of exemptions or exclusions for small farms or local produce.

Overall, the costs and uncertainty of regulatory compliance impact the ability of local food systems to develop and expand into different marketing channels (Martinez et al., 2010). For example, FDA estimates that the proposed rule for produce safety will cost an average of \$11,430 per covered farm, and range between \$88 and \$30,566 depending on farm size (FDA, 2013), and it is uncertain how these costs will affect profitability of farms and market access. Furthermore, the assumptions and data used by the FDA for these estimates may not be representative of the true costs. More reliable data is needed to estimate regional costs of regulatory compliance for various commodities.

The ability of local food systems to access retail marketing channels, participate in FTS programs, and market value-added products at farmers’ markets will depend on better understanding of local, state, and federal food regulations, as well as the ability of growers with small farms to comply with these regulations in a cost effective manner. Numerous consulting firms and programs provide assistance to food industry members related to regulatory understanding and compliance, but the costs of utilizing these service providers may be prohibitive for small farm members of local food systems.

### **Food Safety Research and Local Food Systems**

A greater emphasis on research-based food safety measures may eventually have an impact on consumer

perceptions of local food systems. The FSMA was intended to promote science-based protocols for preventing food contamination with greater emphasis placed on traceability, as opposed to former protocols that focused more on responses to food safety crises. Early assessments of FSMA impacts on food safety and food industry economics have focused on industry-wide or industry-sector scales, but little research has been published on the food safety risks or economic impacts of the FSMA for smaller producers and processors.

Local food systems are in the unusual position of defending the safety of their food while simultaneously pursuing exemptions from the more stringent aspects of the FSMA. The lack of research to address the issues of food safety risks in local food systems may impact the ability to retain FSMA exemptions for small suppliers in the long-run.

Each potential marketing channel has its own source of compliance regulations and associated costs. These requirements may be buyer-driven and, in some cases, stricter than the FSMA. Thus, an examination of the relative costs of food safety and traceability across different marketing channels, even in the presence of the FSMA exemptions, may be insightful. For example, local producers participating in FTS programs may be required by the schools or by the state to document Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), food handling protocols such as refrigeration and packaging of fresh produce, and quality control measures taken by themselves or third-party distributors to remain active in the state FTS program.

Likewise, risks and risk coverage differ between marketing products through a local farmers market or local retail store and differ by state depending on regulatory requirements of state agricultural and health departments. Even with small business

exemptions from the FSMA, local producers are generally encouraged to follow GAP and Good Handling Practices (GHP) protocols. Palma et al. (2010) use the examples of GFSI and GlobalGAP to illustrate that the comparative costs of GAP and GHP standards vary by producer, suggesting research opportunities to address the compliance cost issues by commodity and farm size. The authors suggest more research to support science-based standards and regulations, with government agencies serving as facilitators of compliance among market chain participants.

The most challenging and least understood area of local food marketing involves the retail food-marketing channel. Supermarkets account for roughly 64% of consumers' food dollars, compared to 2.3% for specialty food stores and 5.9% for direct purchases from farmers, processors, and wholesalers (USDA-ERS, 2013). Thus, supermarkets have greater potential for volume-based marketing by local food system suppliers. But as a result of consumer demand for greater food safety and accountability as well as their own liability, supermarket chains place firm guidelines on supplier qualifications, food safety requirements, and suppliers' abilities to perform a product recall. Standard vendor agreements utilized by supermarket chains serve as supplier contracts and often include provisions that supersede the small business exemptions proposed for the FSMA. Supermarkets may even require GFSI compliance for small suppliers. The relative costs and benefits of local food marketing through the retail marketing chain remain largely unknown because of variations in requirements by regional or national supermarket chains.

### **Need for Food Safety Training Programs**

A better understanding of liabilities and exposure associated with various

food marketing channels might help producers understand the nature of different marketing channels and identify the optimal marketing mix for their products. The FSMA and GFSI educational programs are prevalent for large-scale food processors, yet there is little evidence of programs tailored to small suppliers of local food systems. The complicated nature of proposed FSMA exemptions for small businesses and the food handling and processing activities that trigger overrides for those exemptions are vital issues to these small suppliers.

Retail chains clearly state their requirements for a minimum level of product liability insurance for suppliers, but local foods suppliers may not understand the need to maintain some level of liability coverage for marketing through other channels, such as farmers' markets, institutional foodservice, or even roadside stands and "pick-your-own" operations. Additionally, it is important to conduct consumer education programs to reduce contamination risks at home. No food safety system can be comprehensive without including the final consumer.

Collaborations between Extension specialists, local food suppliers, and retail marketers might help producers understand and comply with the requirements of supermarket vendor agreements. For example, Whole Foods demands that all suppliers—including small and organic suppliers—adhere to specific quality standards, product maintenance, receiving procedures, and insurance/recall requirements (Whole Foods Markets, Inc. (WFMI), 2013). Similarly, Walmart has developed a list of "Small & Developing Supplier Requirements" that also includes GFSI compliance for both low-risk and high-risk food products (Walmart, 2013). Targeted food safety training programs and cost determination assistance for small producers might improve the efficiency and

coordination of product distribution between suppliers and marketers.

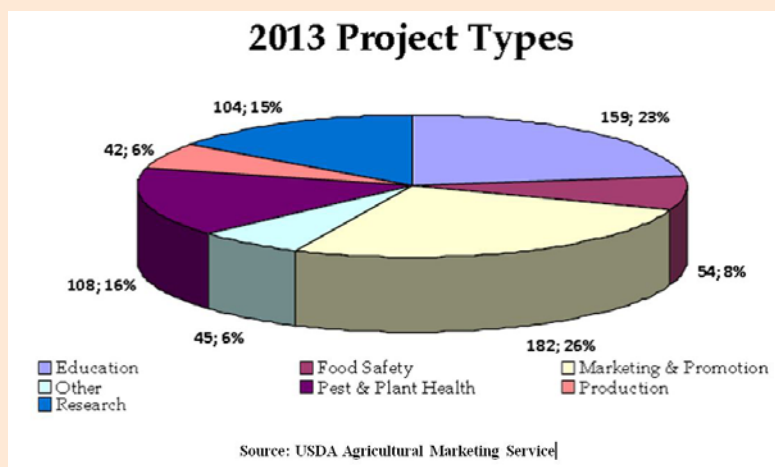
### **Leveraging Resources to Help Local Food Systems with Food Safety**

Food safety research and training programs for local food systems require partnerships between local food entities and groups, land-grant universities, and state and federal agencies. The FDA is an obvious starting point for the FSMA training efforts, in collaboration with state health departments that may be contracted as third-party inspectors for the FDA. Stakeholders in the local food marketing chain, such as retail food stores, FTS program administrators, and farmers' market coordinators, may also be resource providers for various research and training efforts.

State departments of agriculture and health could be strong partners with land-grant universities in developing and delivering outreach programs related to risk assessment and regulatory compliance for farmers' markets and FTS programs. The Specialty Crop Block Grant program administered by USDA's Agricultural Marketing Service is a likely source of resources for research into the size, scale, and economic potential of local food marketing channels. This program has historically emphasized marketing, promotion, and education but has a growing emphasis on food safety projects. In 2008 this program funded 27 projects, but in 2013 the program has allocated 8% of its funds to 54 projects (Figure 1).

USDA's Food Safety Inspection Service would be an appropriate starting point for research and training efforts related to meat, poultry, dairy, and egg products not inspected by the FDA. Land-grant universities can also play a key role in developing risk management education related to food safety standards, GAP and GHP, cost of compliance and third party audits.

**Figure 1:** Specialty Crop Block Grant Fund Allocations for FY2013 (number of projects; percent of funds allocated).



## Taking Actions to Help Local Food System Suppliers

The FSMA is the most sweeping change to food safety regulations in almost 70 years. The panorama for the full implementation of the law is still unclear. Questions still remain about the role small and medium-size farmers will play in satisfying local food demand while ensuring a safe food supply.

In order for local food systems to be economically viable and sustainable, producers must be able to at least offset the higher costs of meeting the newly evolving set of food safety regulations. This issue suggests new opportunities to conduct research and develop outreach programs related to food safety. Key areas include educational programs for compliance and audit procedures to ensure food safety standards are being met, emphasizing the different requirements for different marketing channels. Minimum research-based risk levels can be evaluated to ensure a safe food supply while attaining economic profitability and sustainability of local food systems.

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## Local Food Systems in the South: A Call for a Collaborative Approach to Assessment

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Interest in developing Local Food Systems (LFS) grows with the hope that a community-based approach to food production will provide some measure of relief for social, economic, and environmental problems. Food systems range from very local and even subsistence levels to regional food systems, and extending to global food systems. A LFS is commonly characterized by short supply chains, collaborative relationships between buyers and sellers, support services provided by local businesses, and an intentional focus on the social, economic, and environmental impacts of the production, distribution, consumption, and disposal of food in the community.

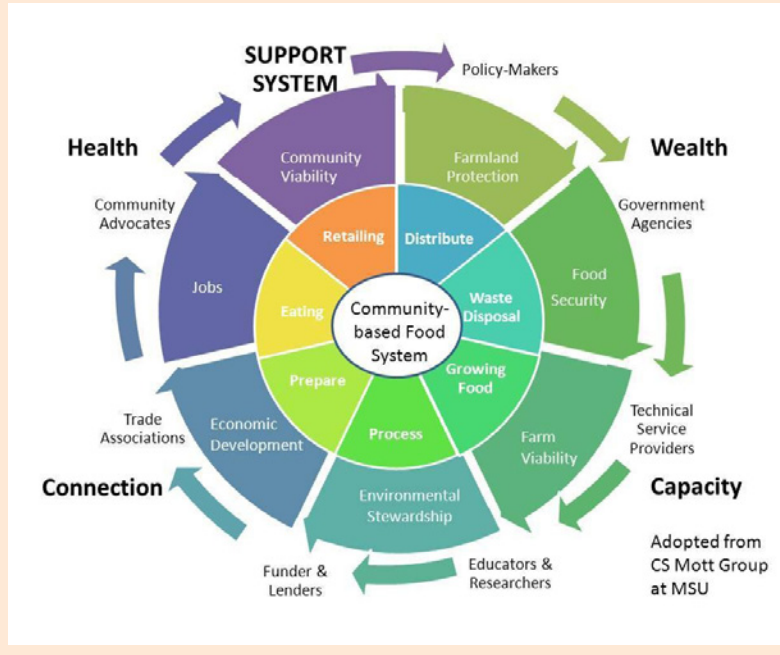
Conventional food systems are sometimes viewed as contributing to existing societal problems such as obesity and poor nutrition. Some community residents, government officials, and academics see local food systems as having the power to improve the well-being of all those along the food supply chain, from producers to consumers, as well as those in-between, including processors, distributors, and retailers. Non-profits, economic development organizations, local governments, distributors, and others are taking specific actions to localize the production-consumption nexus. Various groups and organizations—from health non-profits to economic development organizations to local business groups—are investing directly in more localized infrastructure and indirectly through applied and community-based research and promotion of various LFS investment opportunities. Examples of this at the national level are the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service that focuses on the development of farmers markets, food hubs, and other direct marketing infrastructure, and at the state level South Carolina's

Small Farms Mean Big Business project, North Carolina Growing Together project, and the Eastern Kentucky Food Systems Collaborative.

Some research supports the claims that a LFS positively impacts health, the environment, food security, social capital, and economic well-being. Economic benefits accrue both to producers and the broader community, with findings from numerous studies indicating food produced and consumed locally creates more economic activity in an area than food produced from a non-local source (Holt-Giménez and Wang, 2011; Otto and Varner, 2005; Enshayan, 2008; Sonntag, 2008; and Henneberry, Whitacre, and Agustini, 2009). In the health realm, epidemiological studies have found correlations between higher levels of direct-to-consumer farm sales and lower levels of mortality, obesity, and diabetes (Ahern, Brown, and Dukas, 2011; and Salois, 2012). Additionally, qualitative studies suggest direct connections between local food systems and improvements in consumer eating behaviors, enhanced social activity, and civic engagement at the community level (Saldivar-Tanaka and Krasny, 2004).

However, these studies fall short of the mark if we are interested in knowing the impacts of food system changes over a large region (O'Hara and Pirog, 2013). Figure 1 illustrates the conceptual complexity of any food system. Most existing research studies are limited to single projects and single outcomes in limited geographic areas, such as the economic impact of a farmers' market at the county or state level. Support for improved data collection is needed, as well as studies conducted at larger geographic scales that take into consideration economic spillover effects such as the effect of LFS on property values, job creation,

**Figure 1: One Representation of the Complexity of Local Food Systems.**



or tourism (O’Hara and Pirog, 2013), and that simultaneously consider economic, social, and environmental impacts. Possible negative impacts should also be considered. These include the possible increase in the cost of food associated with smaller-scale operations, the possible economic fragility of small operations, and the added difficulty in establishing traceability for food safety reasons when many small farms are the source of a diverse selection of products.

Improving the quality of research associated with LFS, specifically that focus on impact assessment, may require the creation of a “learning community” of researchers and other individuals working in the LFS area to evaluate and discuss the design, methods, and conclusions of LFS researchers and practitioners (O’Hara and Pirog, 2013). Government and university research combined with non-profit and Extension outreach programming together can create such a learning community, and provide a means to connect regional and national research initiatives to activities at the community-level.

### Current LFS Development Approaches and Projects in the South

The Community Food System Explorer (CFSE), a land grant university project focused in North Carolina and Virginia, was developed to help groups assess community LFS assets and available resources using a geographic information system (GIS) planning tool and a “Community Capitals” framework that includes natural, built, financial, social, human, cultural, and political capital components (Bargainer et al., 2011). The CFSE provides a useful framework for combining data from multiple sources within a comprehensive LFS framework. To date, the CFSE and the Community Capitals approach has been utilized by Extension personnel and community-based organizations in Virginia and North Carolina to facilitate community discussions and planning focusing on local food systems. For example, the Appalachian Food Shed Project is currently using the Community Capitals framework as it seeks to facilitate

collaboration across West Virginia and the Appalachian regions of North Carolina and Virginia. Extending use of the CFSE as a common planning and assessment tool across other communities in the South could provide a common set of methods and measures to better monitor progress and evaluate impacts across communities within the region.

Another useful tool, MarketMaker, a robust, web-based information management system for food industry businesses is operational across 20 U.S. states with eight of those states in the South. Within MarketMaker one can find demographic and consumer preference data for a given community, useful information for developing a marketing program, and determining types and volumes of food products consumers desire. MarketMaker is also a useful tool for determining current food chain assets in the community, from farmer to retailer. All classes of food chain players are in MarketMaker and can be sorted by food industry characteristics and mapped by community. One barrier to implementing MarketMaker and similar technological tools has been the cost of entry, with an initial fee and annual subscription costs. Several states have created other tools with lesser capabilities such as the CFSE’s GIS-based tool and the simple Google-map interface used by the North Carolina Growing Together project to connect businesses across the local food supply chain. A more coordinated effort to bring these and similar projects together under one transparent and comprehensive package and to facilitate the effective use of such tools would surely strengthen the ability of grassroots efforts to foster LFS development. Further, since assessment of LFS requires data that is either scattered across various sources, or is simply not available unless collected specifically for this purpose, efforts like these to collect, curate, and share data are essential.

At present, most LFS development evaluation efforts tend to focus on single-project results, project performance, and individual food system interventions rather than on systemic performance. This may be because LFS development tends to be implemented project-by-project, rather than system-wide (O'Hara and Pirog, 2013). Although planning for LFS development might be comprehensive, actual implementation is often piecemeal; for example, a farm tour one year, a farmers' market added two years hence, and then a food hub considered over the long term. Consequently, evaluation efforts tend to also be piecemeal. Recent and growing interest in the development of Local Food Policy or Advisory Councils might offer an organizational home and source of funding for research on the relationship between LFS interventions and social and health outcomes. Results from such research could inform policy and implementation strategies to maximize policy effectiveness and the strategic use of limited resources.

Community support and buy-in is vital to developing LFS. However, convincing others of the value—economic, social, and environmental—of localized systems means having evidence of tangible community benefits that make sense to others. Garnering the support of diverse stakeholders, in particular local governments and economic development personnel and planners, must be considered when studies are designed and evaluations conducted. Measures of economic benefits are typically the most highly valued and sought after evidence of LFS value because these measures appeal to those who typically hold positions of power and influence in the community. However, a narrow focus on solely economic impacts may create unintended social and environmental consequences. These potential unintended impacts, positive and negative, must be considered, if we are to make effective long-term

solutions-oriented decisions. Consistently applying a comprehensive systemic research framework and associated outreach and development activities can help ensure the long-term sustainability of LFS.

### **Creating and Assessing Change**

The economic opportunities that enhanced LFS can offer should be considered as part of a comprehensive community development strategy that encompasses more than single businesses or sectors. An example could be the potential economic impact on tourism of a vibrant craft cheese industry in a specific region. Although it is unlikely a single cheese manufacturer would generate substantial employment, it might be the tipping point for a community to begin to attract culinary tourists. A short-term, narrow focus on immediate economic impacts might miss the more complete set of long-term systemic impacts.

Creating economic benefits from LFS development involves choosing from one or more of several strategies. These include: 1) Import substitution to identify and replace non-local imports with products from local suppliers; 2) New business creation, a strategy to be adopted in situations where local suppliers do not currently exist; 3) Business retention or expansion which may help a currently struggling food sector business and strengthen non-food businesses in a region; 4) Tourism development, a viable and distinct local food system to create a growing interest in culinary tourism; and 5) Attracting outside investment from private sources and state or federal grants. These economic development strategies might also converge with natural market forces to create a system where old and new firms co-exist in a mutually-supportive and synergistic local food system.

A reasonable starting point for accurately measuring economic change due to LFS enhancement is having

a clear understanding of the baseline food system pre-intervention and an understanding of the next-best alternative uses of the resources involved in the enhancement of LFS. The current baseline is typically an integrated food system that evolved as a result of private sector investment augmented by public and non-profit sector support. The influence of these activities and support mechanisms varies greatly by region, resulting in a complicated mosaic of baseline regional food systems. Because of these complexities, researchers should broaden the set of outcomes and attendant baseline measures, rather than focusing only on a narrow set of economic outcomes such as number of jobs created (O'Hara and Pirog, 2013). Measures of comparison between conventional and Local Food Systems should include:

- Local food sales by farmers
- Institutional food purchases from local and regional farms
- Farm enterprises and food-based business startups created and expanded, including associated businesses such as processing, food hubs, distributors, and equipment dealers
- Differences in food preparation habits and fruit and vegetable consumption in households located in close proximity to community gardens
- Crop field loss associated with local food marketing channels compared to field loss in conventional channels
- Measurement of enhanced entrepreneurial activity such as producer cooperation in crop planning
- Creation of value added businesses in communities with and without active farmers markets and farmers market associations
- Likelihood of farm ownership succession on farms with local food marketing channels versus those reliant on conventional channels

Other measures may be added. The point is that there is typically a whole lot more going on than is typically measured.

### **Opportunities for Collaboration to Better Measure Impacts**

Several regional stakeholder organizations exist in the Southeast that have LFS development as one of their primary mission areas. These include The Southern Sustainable Agriculture Working Group, the Southern Sustainable Agriculture Research and Extension organization, and the Carolina Farm Stewardship Association. These and similar groups were often created with an explicit LFS development mission in mind; others adopted this mission along the way in response to constituency interests or needs. Many of these groups are currently partnering, or are interested in partnering, with others to foster more frequent and higher quality comprehensive impact assessments of LFS. For example, the Carolina Farm Stewardship Association is working in conjunction with the North Carolina Division of Public Health's Community Transformation Program to conduct an assessment and create an action plan for increasing the availability of fresh, locally sourced food in Beaufort County, North Carolina.

Good community development processes create plentiful opportunities for involvement of stakeholders. Their involvement can also play an important role in a comprehensive assessment of LFS. Involving a broad array of organizations and their expertise can shed light on and develop quantifiable metrics along numerous dimensions—economic, social, and environmental.

What is needed is four-fold. One, a stable institutional arrangement is needed whereby these groups can regularly convene to focus on a long-term agenda for structuring collaborative tools and a common framework. Two, successful development requires

conveners and facilitators who can assist with design and implementation of worthwhile LFS projects. Three, a network of LFS researchers working somewhat at a distance from those focused on implementation is needed to provide objective feedback informed by efforts in other communities and regions. Four, funding for both implementation and assessment research is needed to optimize investment of scarce resources for LFS development.

Overall, these can provide a collaborative framework with thoughtful leadership to guide the development of LFS that provide a range of social, economic, and environmental benefits to communities.

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Community Food System Explorer <http://www.sare.org/Learning-Center/Project-Products/Southern-SARE-Project-Products/Community-Food-System-Explorer>.

Eastern Kentucky Food Systems Collaborative <http://www.appalfoods.org/>

National Food MarketMaker <http://national.marketmaker.uiuc.edu>.

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North Carolina Local Food Infrastructure Inventory <http://www.cefs.ncsu.edu/statewide-infrastructure-map.html>.

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