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The Economics of Local Food Systems:

A LITERATURE REVIEW OF THE PRODUCTION, DISTRIBUTION, AND CONSUMPTION OF LOCAL FOOD

September, 2014

By Ariel Pinchot

Editor:
Mary Vitcenda



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By Ariel Pinchot, Graduate Student, College of Food, Agriculture, & Natural Resource Sciences

Editor:
Mary Vitcenda

Contributors:
Merritt Bussiere, Extension Educator, Center for Community Vitality
Ryan Pesch, Extension Educator Center for Community Vitality

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INTRODUCTION

The past decade has seen substantial and growing interest in the promotion of local food systems throughout the United States. The increasing consumer demands for fresh local produce and other farm products are driven by the beliefs that local food production systems are more sustainable, healthy, and supportive of local economies. As a testament to rising consumer demands, sales of local food through direct markets have grown tremendously —annual direct-market sales increased from \$511 million in 1997 to \$1.2 billion in 2007 (Martinez et al., 2010). Such growth has been supported by dramatic expansions in the numbers of direct market channels. For example, today there are 8,161 farmers markets listed in the United States Department of Agriculture’s National Farmers Market Directory, an increase of over 67 percent since 2008 (USDA AMS, 2013). In addition, more than 3,800 school districts across the nation, representing nearly 40,000 schools, source food from local farmers, ranchers, and food businesses (USDA Farm to School Census, 2013). Further, the number of food hubs nationwide has grown by 68 percent since 2008, reaching a total of 220 currently in operation (USDA KYF2, 2013). Every state in the country now has a local agricultural branding program, such as “Minnesota Grown” and “Jersey Fresh.”

With the recent and continued growth in the demand for locally grown food, questions emerge about market characteristics, the capacity of local food systems to support regional economic development, and the economic aspects of the production and consumption of local foods. What do we know about the economics of local and regional food systems? What is the status of research in this arena? The authors and contributors to this report found no comprehensive literature review concentrating solely on the economics of local or regional food system development. We seek to address this literature gap by providing a review and annotation of key publications on the economics of local food system development. Within this subject, we specifically focus on the characteristics of local food markets, local food consumers and motivations for purchases, local food producers and food hubs, and the role of food systems in community and economic development. Potential beneficiaries of this literature review include educators and other academic staff, students, local food advocates, and a range of professionals who participate in local food system development. Structured to highlight key findings from many sources up front, and followed by an annotated bibliography of selected publications, the review is designed to serve as a helpful introduction to recent research on the economics of local foods in the United States. Food system research in the state of Minnesota receives a special focus in this review.

What are local food systems?

There is no professional or academic consensus on the term “local food.” For some, the term has geographic connotations, simply signifying food that has been produced within so many miles of where it is sold. For others, the term is based on political boundaries, such as state lines (Adams & Salois, 2010). Use of the term often reflects a combination of these two criteria, as in the 2008 Farm Act. Accordingly, the U.S. Congress considers food transported less than 400 miles, or that is sold within the state where it is grown, to be a “locally or regionally produced agricultural food product” (Martinez et al., 2010). Still, for others, the term carries ethical meaning or a sense of community, with emphasis on how the food is produced, distributed, and consumed.

For the purpose of this review, we define “local food” as food that is distributed directly to consumers or through “short supply chains.” Under this definition, a short supply chain indicates not merely short distances between production and consumption of food, but more importantly, few, if any, intermediary actors between producers and consumers. Examples include direct sales to consumers at farmers markets or through a community-supported agriculture (CSA) program, as well as a regional food hub selling food from multiple farms to a local institution such as a hospital. As such, local food systems with short supply chains enable the preservation of farm identities and relationships, as well as the preservation of product value between farms and consumers.

The conception of local food systems with short supply chains includes two broad types of market transactions for food distribution: direct markets and intermediated markets. Direct markets describe exchanges of food from farmers or producers directly to end consumers or to institutional buyers. These market channels include direct-to-consumer markets – such as produce sales through farmers markets, CSAs, or agritourism – as well as direct-to-institution markets – such as farm-to-school or farm-to-hospital arrangements. On the other hand, fresh produce exchanged through intermediated markets involves additional parties – the intermediaries – including local grocers, restaurants, or regional distribution outlets. Guided by our conception of local food systems, we focus this review on the production, distribution, purchase and consumption of food through direct and intermediated market channels.

LOCAL FOOD MARKETS AND MARKET ANALYSIS

With sales of \$4.8 billion in 2008, locally marketed food through both direct and intermediated channels accounted for only 1.9 percent of total annual food sales (Low & Vogel, 2011a). While most local food is sold through intermediated markets by large farms in large quantities, the majority of producers supplying local food are small farms, selling through direct markets. In recent decades, these direct markets have experienced substantial growth, representing an important market opportunity for producers. Direct markets are not only more accessible to small producers, but can also present distinct advantages over intermediated markets, by certain measures. In order for small producers to better penetrate intermediated and wholesale markets, there are a number of key supply chain barriers that need to be addressed.

Characteristics of market segments

On a national level, research shows that market activity for local food is slightly concentrated in intermediated markets. These markets are dominated by a relatively small number of large farms. By comparison, most small farms participate in local food markets in direct markets, and while more small farms market local foods than large farms, small farms generate lower sales levels on average.

Intermediated markets

Low and Vogel (2011b) found that between 50 and 66 percent of food sold locally in 2008 was marketed through intermediated channels rather than through direct-to-consumer channels. In the same year about 13,400 farms sold exclusively through intermediated channels, generating \$2.7 billion in sales. Large farms supplying to these intermediated markets accounted for the greatest proportion of the nation's total market share of local foods. Another 22,600 farms engaged in a combination of intermediated and direct-to-consumer marketing, generating over a quarter of local food sales –\$1.2 billion (Low & Vogel, 2011a).

Direct markets

In 2007, about 6.2 percent of the nation's farms sold to direct markets (Martinez et al., 2010). About 71,200 farms engaged exclusively in direct-to-consumer marketing channels that year. While the direct marketing channel is the most common for farms that sell local food, this channel generates a disproportionately small volume of sales relative to the fewer number of farms that sell through intermediated channels or a combination of both channel types. In 2008, farms selling exclusively through direct markets generated \$877 million in sales (Low & Vogel, 2011a).

Growth trends in direct markets

Despite the dominance of intermediated markets in local food sales volume, direct markets have grown significantly. This growth is seen in the quantity of existing markets, the volume of sales, and the levels of farmer participation. For example, the period between 1992 and 2002 saw a 79 percent increase in the number of farmers markets in the country, a 37 percent increase in the value of

products sold through direct marketing, and a five percent increase in the number of farms engaged in direct marketing (Thilmany & Watson, 2004). Alongside such growth, new business models to market local foods have emerged, including CSA, farm-to-institution markets, and virtual farmers markets (Borst, 2008). These national trends in direct market growth are also apparent in Minnesota. The number of farmers markets in the state, for example, increased by 85 percent over a three-year period – reaching 150 in 2011. Food producers and businesses in Minnesota have also witnessed growth in demand for local food and expect the growth to continue (Joannides, 2011). This growth in direct markets for local food represents an important market opportunity for local food producers, especially for small-scale farmers.

Supply and demand

In certain regions of the United States, the demand for local food is greater than the supply today. This suggests a significant market potential for producers of locally marketed foods. However, in some regions, producers lack interest in selling produce in local markets to meet existing demand (Schneider & Francis, 2005; Karnitz, Mao, Mathers, Patnode, & Xu, 2013). Additional research is needed to identify the degree to which market barriers restrict the further development of local food systems in a given region and the extent to which the benefits of direct market channels for local producers outweigh the perceived advantage of larger volume sales.

Benefits of direct market channels

Local supply – through direct and intermediated markets – meets only a small portion of total demand for food products. But selling food products through local supply chains enables farmers to capture a greater share of retail prices than selling through mainstream markets, even when accounting for additional costs. Direct marketing channels, especially important for small-scale farmers, offer an accessible market in the face of low farm-gate prices (prices before supply chain entry) and wholesale purchasers' preferences for high volume. Accordingly, for small-scale farmers, direct marketing is generally the most optimal marketing form in terms of maximizing profit while minimizing labor investments. CSA marketing strategies can increase profitability (LeRoux, Schmit, Roth, & Streeter, 2010), even through minimal exertion of market power by farmers (Lass, Lavoie, & Fetter, 2005). Ultimately, the profitability of any market channel depends on unique characteristics of production, including volume, costs, prices, and marketing skills.

Prices and market power

While direct marketing is often associated with additional expenditure to bring the product to market – including processing, distribution, and marketing – producers participating in direct markets can still receive significant price premiums net of such costs. Indeed, despite the small market size, producers tend to earn a greater share of retail prices in direct and intermediated markets relative to mainstream markets. King and colleagues (2011) have found that direct markets yield producer shares ranging from 70 to 80 percent of the retail value. In addition, selling local food products in direct markets often enables small farmers to be price makers, rather than price takers. In other words, producers are able to set prices because their products have unique characteristics for which there is a strong demand and a lack of ready substitutes (Diamond, Barham, & Tropp, 2009). In some markets, CSA farms have market power to set share prices, although they choose to exert very little of that power (Lass et al., 2005).

Differential outcomes of direct market channels

Within direct marketing, each outlet has different costs and benefits where certain channels are more optimal than others. For example, wholesale marketing channels may enable sale of greater volume of produce, but at a reduced price relative to farmers market sales. Farmers market and

staffed “u-pick” operations require higher-than-average labor hours to achieve the same levels of sales as CSAs, unstaffed u-pick, and wholesale distribution channels. For small-scale producers, the CSA direct marketing channel is generally the most optimal, producing the most efficient outcomes in volume, unit profits, labor input, and risk preferences (LeRoux et al., 2010). Lass and colleagues (2005) provide additional evidence of the potential of the CSA model to increase profitability of family farms. At the same time, Park, Mishra, and Wozniak (2013) find that farmers who use only direct-to-consumer sales strategies tend to see lower earnings than those who use mixed marketing strategies. Ultimately, individual characteristics of the farm operation –including size, costs, market access, level of marketing skills and other factors – will determine the ideal market outlet.

OVERVIEW OF CONSUMER PREFERENCES

There are key distinctions among consumer groups in their motivations for purchasing local foods. In general, household consumers are most concerned with freshness and quality, although these preferences and motivations are further differentiated by the location of purchases of local foods. Household consumers who frequent direct markets and prefer local food products, value freshness and quality attributes more than average consumers; they are also less concerned with the convenience of purchase location and price of product. The availability of fresh, quality, locally produced foods is a key driver for farmers’ market purchases, although the social interactions that take place at the market are also important factor for drawing in consumers. Institutional purchasers of local foods – including schools and hospitals – are often motivated by the good will and good publicity that results from serving local foods, as well as the desire to offer more fresh and healthy foods to their students, patients, or clients. Price is an important concern for institutions, but a number of other logistical concerns also influence buying decisions.

Household Consumer Preferences and Motivations

Freshness and quality

Nearly all consumer research on local food preferences identifies freshness and quality of the products as the most important attributes for household consumers. Bond, Thilmany, and Bond (2009); Brown (2003); and Gao, Swisher, and Zhao (2012) all show the same findings. Furthermore, consumers who value fresh and high-quality produce (fruits and vegetables) are more likely to seek out local produce (Bond et al., 2009; Brown, 2003). Research into meat products also finds freshness and quality to be the top attributes (Bernard, 2012).

Price and willingness to pay

The price of produce is another important factor in household consumers’ buying decisions. Notably, the price of local foods seems to be a more important purchasing criterion for general household consumers than for direct market household consumers. For example, general consumers have indicated that high prices of local produce constitute a barrier to purchasing local food (Brown, 2003; Bailey, 2013). However, among farmers’ market consumers, price is not generally ranked as an important factor, let alone a barrier (Conner, Colasanti, Ross, & Smalley, 2010). This likely relates to the self-selection biases of market participants and the demographic composition, which tends to reflect higher income levels and educational status than the national average (Hunt, 2007).

A proportion of household consumers indicate a willingness to pay a price premium for locally produced food. A survey in South Carolina, for example, shows that household consumers are willing to pay an extra 27.5 percent price premium for state-grown produce relative to non-local produce. Not surprisingly, however, there is an inverse relationship between the price premium and the proportion of consumers who are willing to pay for it (Brown, 2003; Schneider & Francis, 2005;

Carpio & Isengildina-Massa, 2009). Just as some consumers are willing to pay more local food products, 30 percent are willing to change where they purchase food in order to access locally or regionally sourced food (Pansing et al., 2013).

Support for local farms

Supporting local farmers and the local economy is also a strong motivator for purchase of locally sourced fresh produce. This is especially true for farmers market consumers (Gao et al., 2012), and for consumers of local beef (Bernard, 2012). However, the average consumer is relatively unaware of the rationale for supporting local food markets and may be less likely to purchase local food without more strategic awareness campaigns, according to Bailey (2013).

Customer loyalty and social interaction

Consumers purchase produce at farmers markets because of the freshness, quality, and locality of the available produce. However, consumers would likely continue shopping at the market even if the product qualities did not meet their expectations, indicating a high degree of consumer loyalty (Gao et al., 2012). In addition, farmers markets possess high social embeddedness, meaning social interactions are an important aspect of drawing in consumers. These social interactions also have a positive influence on consumer spending (Hunt, 2007).

Institutional Consumer Preferences and Motivations

The number of institutions that seek out local foods has increased in recent years. A large proportion of institutional food buyers have either purchased local foods or have expressed interest in doing so in the future. Those who currently purchase local food expect to expand their programs in the coming year. As of 2013, about 41 percent of U.S. public school districts participated in some form of farm-to-school programs, while the rate in Minnesota was substantially higher at 71 percent (USDA, 2013). At that time, the most common motivations for purchasing local foods among institutional representatives were to support local producers and the local economy, and to procure more fresh, healthy, and high-quality foods. The primary barriers that prevented local food purchasing, as of 2013, centered on challenges in securing consistent supply and the lack of appropriate internal facilities and staff training for preparation of whole foods.

Support for local farms

Institutional consumers have consistently viewed supporting local farmers and the local economy as a leading motivation for purchasing local foods. This finding is consistent across multiple surveys of institutional buyers, which include food purchasers for public elementary and secondary schools, colleges, universities, correctional facilities and hospitals, among others. Matts and Colasanti (2013), Colasanti, Matts, and Hamm (2012), Grace (2010), Sachs and Feenstra (2008), and Gregoire and Strohbehn (2002) all substantiate this finding.

Fresh, healthy food

Institutional food buyers also consistently identified the desire to increase access to healthier and fresher food for students, patients or clients as another strong motivator for local food purchasing (Matts & Colasanti, 2013; Colasanti et al., 2012; Grace, 2010; Gregoire & Strohbehn, 2002). For hospitals, there is the additional motivation to increase healthy eating and high-quality fresh produce for dietary disease prevention (Sachs & Feenstra, 2008).

Price

Institutional food buyers name high cost as a top concern about local food purchasing (Bailey, 2013; Colasanti et al. 2012; Grace, 2010). This is also true in Minnesota, where public school districts commonly cite cost as a barrier to sourcing more local food (IATP, 2011). Institutions that maintain

local food programs are less likely to rank lower prices as important considerations in purchasing decision than institutions without local food programs (Hardesty, 2008). On the other hand, some hospitals have identified local food purchasing options as a potential cost saver (Sachs & Feenstra, 2008).

Barriers

Institutional consumers face a number of barriers to increasing their sourcing of local foods. These barriers generally fall into categories of sourcing logistics and processing capacity. For sourcing logistics, Bailey (2013), Matts and Colasanti (2013), Colasanti et al. (2012), Sachs and Feenstra (2008), and Gregoire and Strohbehn (2002) all find that institutional buyers experience difficulty securing a consistent or sufficient supply of local foods, especially through all seasons. Institutional buyers also face challenges over unreliable product delivery or complex purchasing processes. The commonly cited processing capacity barriers include extra labor required for food preparation, inadequate staff skill, and lack of facilities to handle or store local food. Further, there is a general concern among institutional food buyers about maintenance of quality and safety standards for produce and other local foods (Strohbehn & Gregoire, 2004; Grace 2010; Colasanti et al., 2012; Bailey, 2013; Matts & Colasanti, 2013).

Wholesale and retail customer preferences and motivations

Wholesale and retail food buyers – which include distributors, conventional retail and independent stores, and restaurants – show increasing interest in purchasing locally produced foods. However, a number of common barriers in supply chains limit the volume of such purchases and prevent greater penetration of locally produced food in conventional markets. These barriers involve the need for consistency of supply, high product volume, descriptive product information and labels for produce, streamlined logistics, and the means to connect with new suppliers. Wholesale and retail food buyers also see trust as an important factor in building supply chains for local food.

Product quality and volume

A 2009 study by the Agriculture Utilization Research Institute finds that for wholesale and intermediate food purchasers, supply volume, consistency, and quality are among the primary factors that limit increased purchase of local foods – despite growing interest (AURI, 2009). Abatekassa and Peterson (2011) also confirm this finding.

Product branding and labeling

When making local food purchases, retail and wholesale food buyers cite preferences for detailed product labeling and information about origin. Diamond and Braham (2012) cite a strong need to preserve the integrity of product differentiation or identity – such as origin, variety, and production practices – within local food supply chains. If food travels through a distributor, this likely requires an effective identity preservation system, i.e., branding, to help maintain marketing claims.

Market interactions

Independent retailers tend to have more experience sourcing local food than supermarket chains and wholesale buyers, but they also tend to source smaller quantities of food (Abatekassa & Peterson, 2011). Most sales to stores that purchase local food directly from farmers are initiated by farmers directly. Stores buying directly from farmers often prefer this method of direct contact by farmers and are much less likely to contact farmers through the Internet, directories, or trade shows (DiGiacomo, 2012). Factors including trust, reliability, strong communication and information sharing are also important for improving local farmers' access to conventional supply chains for supermarket chains and wholesale buyers (Abatekassa & Peterson, 2011; AURI, 2009).

LOCAL FOOD PRODUCERS AND FOOD HUBS

As noted, most farms that produce local food are small farms working directly with buyers. Large farms that supply in great quantity – and generally through intermediated markets – account for the majority of the total sales volume, but for small producers, direct marketing tends to be the most profitable – with a combination of direct market outlets allowing optimization of produce sales. In choosing specific market outlets, producers cite a number of important factors, including the ability to develop relationships with customers and to maintain profitable prices, as well as to maintain autonomy in production scale and produce type --thus ensuring access to reliable customers. When choosing to work directly with institutional markets, producers are often motivated by the ability to provide access to fresh and quality produce –a particularly important factor for schools. Some common challenges for producers include the ability to produce large-enough volume to meet demand and to access sufficient markets and customers to make a profit. For direct-to-institution markets, seasonality of produce is the greatest barrier to entry.

To address some of the existing supply chain gaps in local food distribution, food hubs are an increasingly popular market development. Food hubs are defined as facilities that manage the aggregation, storage, and, distribution or marketing of locally produced food. Recent national surveys show that food hubs serving the general role of market aggregator can be a sustainable financial endeavor for producers, although some require additional external funding.

In addition, where there is appropriate supply, food hubs can play an important role in local food markets by increasing the scale of local food procurement and market access for local producers. However, research also indicates a range of challenges for growth and general sustainability of food hubs, as well as for their ability to benefit small producers (Fischer et al., 2013).

Looking at Trends

Surveys of small and mid-sized food producers reveal a number of trends in production practices, decision making, and capacity for producing local food. For a substantial number of small and mid-sized farms, farm activities are not the primary source of income for households. For example, many small producers operate as market gardeners or part-time farmers. Direct-to-consumer market channels are one of the most important channels for these smaller, non-commodity producers. In Minnesota, producers who distribute through farmers' markets, onsite or through CSAs were found to sell the majority of their produce through these channels (Hultberg, 2011).

Effect of farm size

Amidst a national trend towards land consolidation by large farms, in some regions the number of small part-time or residential farms are growing, and the number of farms marketing through direct-to-consumer channels are increasing (Schmidt & Bills, 2013). On a national level, local food production generally continues to occur on smaller sized farms (MacDonald, Korb, & Hoppe, 2013). In fact, farms that produce local food tend to be substantially smaller than other farms both in terms of acreage and sales volume (Martinez et al., 2010). In 2010, the national midpoint acreage for produce farms that sell to local markets was 168 acres, compared with 675 acres for non-local produce farms. Farms that sell to local markets account for less than 5 percent of the nation's total cropland (MacDonald et al., 2013).

In terms of relative sales volume, about 81 percent of farms that supply local food are small farms with gross annual sales below \$50,000; however, these farms account for only 11 percent of total local food sales. Meanwhile, large farms with annual gross sales of \$250,000 or more and distributing through intermediated markets represent only 5 percent of all farms producing local foods, but they account for 70 percent of local food sales. Accordingly, the average value of annual

local food sales in 2008 ranged from \$7,800 for small farms, \$70,000 for medium sized farms, and up to \$770,000 for large farms (Low & Vogel, 2011b), where figures are substantially lower when those local food sales were restricted to only direct market sales (Martinez et al., 2010).

Farm size is an excellent predictor of the market channel in which local food producers participate. The larger the farm, the more likely it will supply customers via intermediated markets (Low & Vogel, 2011b). Small farms are the largest group engaged in direct market sales, and although they earn significantly less in average direct market sales per farm, these sales represent a greater contribution to their total direct farm sales than is the case for larger farms (Martinez et al., 2010).

Components of farm income

For many small and medium produce farmers, food production is not the sole source of family income. In a survey of New York farmers, for example, LaMendola (2013) found that food production is a secondary source of income for most small-scale food producers. Similarly, a survey of Iowa farmers selling produce at farmers' markets reveals that most family income is not generated through farming activities (NASS, 2009). Comparably, a survey of CSA farmers in the Upper Midwest shows that off-farm income generates about 50 percent of family income on average (Tegtmeier & Duffy, 2005).

Farm profitability and marketing mix

For small-scale farmers, direct marketing is generally the most optimal marketing channel for maximizing profit while minimizing labor investment. Direct markets often enable producers to maintain price premiums on produce even when accounting for additional costs of processing, distributing, and marketing. Each direct marketing outlet carries trade-offs in costs and benefits in which certain channels are more optimal than others. For example, while wholesale marketing channels may enable greater sales volume, the prices are lower relative to prices fetched at farmers markets. However, farmers markets, as well as staffed u-pick operations, require greater-than-average labor investments to achieve the same sales levels.

For small-scale producers, CSA direct marketing generally offers the highest profitability among marketing channels (LeRoux et al., 2010). Despite this advantage, producers who engage in CSA distribution generally pursue additional direct marketing channels. This indicates that flexibility to combine different channels is important for optimizing produce sales, especially considering the unpredictability of harvest quantity and the perishability of the products (Tegtmeier & Duffy, 2005; Woods et al., 2009; LeRoux et al., 2010).

Challenges to expansion

Nearly all surveys indicate that most small and mid-sized food producers display an interest in and have the capacity to expand production. Bailey (2013), Hultberg (2011), LaMendola (2013), SHIP (2013), and the Intervale Center (2008) all support this finding. However, several barriers to expansion exist, including a continuing struggle to produce sufficient product volumes to meet demand. Both Bailey (2013) and Hendrickson et al. (2013) identify this challenge. The Intervale Center (2008) and Bailey (2013) also highlight challenges in accessing and maintaining a local customer base, as well as general labor and resource constraints. Lastly, producers name regulations and certification requirements as a challenge to scaling up (Hendrickson et al., 2013).

Motivations of Local Food Producers

Local food producers cite several reasons for selecting specific market channels, including access to reliable customers, convenience, and the ability to build relationships with customers, as well as grow desired products at a desired scale. These producers also cite advantages in price and income

for choosing specific market channels. As noted, most food producers do not use all of their available land and possess the capacity to expand production. In Minnesota, the bulk of farmers have expressed interest in expanding production.

Community benefit and relationships

For many farmers, providing community benefits and building social relationships are important factors in the decision to produce local food for local markets. In a 2013 survey of Nebraska and Missouri farmers, most respondents cited the ability to contribute to the quality of life in their community as a primary motivation for producing food for local markets (Hendrickson et al., 2013). Tegtmeier and Duffy (2005) found that CSA farmers ranked developing closer relationships with consumers and stronger ties to the community as the strongest motivating factors for starting a farm. Tegtmeier and Duffy also found that these sentiments also commonly guided farmers' decisions about markets with which to engage. In Minnesota and North Dakota, the most highly ranked considerations for market decisions in 2013 included building relationships with the community and increasing local customers' access to healthy, locally grown food (SHIP, 2013). Hultberg (2011) found that enjoying a relationship with customers was another important motivator.

Ability to produce desired product at desired scale

In many studies, local food producers cited the importance of maintaining autonomy in production practices as a reason for producing food for local markets. Hendrickson and colleagues (2013) are researchers who identified this added level of independence as a common motivating factor for farmers committed to producing food for local markets. Likewise, Hultberg found in 2011 and the Minnesota Statewide Health Improvement Program (SHIP) in 2013 that local farmers like the ability to produce desired products at a desired scale.

Price and profit considerations

Producers' selection of markets for their products is strongly guided by considerations of price and profit. Research by Hultberg (2011) and the Intervale Center (2008) both reveal this trend. CSA farmers responding to a 2004 study also cited the ability to secure financing and markets ahead of production as a common motivation for engaging in this direct marketing channel (Oberholtzer, 2004). Hendrickson et al. (2013) found that many farmers cited the ability to earn additional income as a motivation for producing food for local markets.

Convenience and access to reliable customers

Studies reveal that market convenience and reliability of customers are among the top considerations when local growers choose market outlets for local foods. The reliability of customers was the most highly ranked consideration among producers in Minnesota and North Dakota according to SHIP (2013). In an earlier study, Vermont farmers engaged with direct-to-consumer markets also cited access to customers and general convenience as important benefits to those outlets (Intervale Center, 2008).

Direct-to-Institution Markets

Direct-to-institution markets - including K-12 schools, universities, and hospitals - represent a smaller marketing channel than other direct methods for marketing local foods. This channel generally lags behind direct-to-consumer channels in terms of the percentage of producers that sell produce through each channel. However, when viewed as a whole, producers generally engage in direct-to-institution marketing at greater rates than wholesale, cooperative, or distributor channels. When selling directly to schools, most producers in the Upper Midwest generally sell in small quantities of less than \$5,000 total value (Berkenkamp, 2012).

Motivation for participation

Providing access to fresh and quality foods is a common motivation for participating in direct-to-institution markets. In 2005, Iowa producers cited providing access to fresh and quality foods as one of the top perceived benefits of such market channels (Gregoire et al., 2005). In addition, Berkenkamp (2012) found that the desire to widen access to fresh and quality foods was among the most highly cited motivations for selling to schools. Other motivations cited in that study were strengthening the community, diversifying market outlets, and educating consumers.

Barriers to participation

Producers cite a number of obstacles to engaging in or expanding direct-to-institution markets. Seasonality is a common constraint to supplying institutions because farmers are often unable to produce desired food products for year-round consumption. Lack of year-round availability is the greatest barrier to supplying schools because the seasonality of fruits and vegetables does not conform to schools' ordering schedule. Other concerns with direct-to-institution sales center on the ability to produce enough foods to fulfill orders, and the ability to obtain a sufficient price for products (Berkenkamp, 2013; Gregoire et al. 2005). LaMendola (2013) has also found that many producers lack the plans and certification (including a marketing plan, farm safety plan, and USDA Good Agricultural Practices 3rd party audit certification) necessary for institutional sales. In addition, there are incentives for small farmers to aim their supply to channels that offer higher prices and are overall more cost efficient, including farmers markets and CSAs (Karnitz et al., 2013; LeRoux et al., 2010).

Food hubs

While demand for local food is growing in various retail and wholesale markets, many small and mid-sized producers have difficulty accessing these markets due to lack of appropriately scaled distribution and processing infrastructure (USDA, 2013). The concept of food hubs is becoming an increasingly popular response to these gaps in supply chain infrastructure. The USDA 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, 2012). The idea is that through the development of business infrastructure and intervention in transactions, food hubs will make it possible for producers to gain entry into new and additional markets - thereby expanding agricultural production and economic activity.

Food hub services

National surveys reveal that the average food hub works with 40 regular food suppliers, most of which are small and mid-sized farmers (Barham, 2011). Most food hubs function primarily to aggregate and distribute food, but many also provide additional services, including marketing and product storage. A smaller fraction of food hubs also operate as incubator farms, provide liability insurance for producers, or offer processing or packing services. Working with multiple market channels, food hubs fill the important functions of increasing market access for small producers and reducing transaction costs of local food purchases by institutional buyers (Fischer et al., 2013).

Financial feasibility of food hubs

Recent national surveys indicate that food hubs can be financially sustainable (Barham, 2012). Surveys completed in 2012 show that the *median* business efficiency ratio- a measurement of the expenditures over revenues - for food hubs was at a break-even point (ratio of 1.00) in 2012. However, a *mean* business efficiency ratio of 1.07 in 2012 indicates that, on average, expenses were exceeding revenues for food hubs throughout the country. The economic viability of food hubs is positively correlated with the number of years of operation and the number of producers supplying

the food hub. Further, food hubs organized as for-profit enterprises or cooperatives are more likely to be economically viable than non-profit structures (Fischer et al., 2013).

Studies assessing the potential of future food hubs in a given context largely indicate the feasibility of the model. If properly developed, and if the assumptions in these analyses are accurate, food hubs have great potential to create many positive economic benefits for a region. Analyses by Aubrey (2012), Dane County, WI (2012), and the Happy Dancing Turtle non-profit organization (2012) found that there is generally a market opportunity for product coordination, and that food hubs can help fill market gaps, increase farm revenue, and create new jobs. However, as Aubrey (2012) notes, it is unlikely that a one-size-fits-all model is appropriate for food hub development. Instead, food hubs should be carefully tailored to the context of the local markets.

Challenges to food hub development

Food hub development faces a range of challenges to growth and general sustainability. In recent national surveys in 2012 and 2013, almost all food hubs reported that the demand for their products and services are growing, but most also reported that they faced barriers to meeting this demand. Common operational barriers revealed in 2011 and 2013 surveys included balancing supply and demand, negotiating prices with producers and consumers, and managing growth. Accessing capital was found to be another persistent challenge (Barham, 2012; Fischer et al., 2013).

Feasibility analyses of future food hub development also identify risks from the potential lack of producer interest to supply the needed volume for efficient operations (Dane County, WI, 2011). In rural Minnesota, for example, Karnitz and colleagues (2013) found that producers may have a limited interest in filling the demand for local food through a future food hub. However, other research indicated a strong interest among Minnesotan farmers in selling to a potential food hub (Happy Dancing Turtle, 2012). In order to ensure the feasibility of a future food hub, these and other local market dynamics should be thoroughly understood and addressed in planning processes.

ECONOMIC IMPACTS OF LOCAL FOOD SYSTEMS

Research on the economic implications of localized food production indicates that local food systems provide substantial economic benefits to communities and regions in terms of direct, indirect, and induced impacts. The most cohesive theme throughout this literature focuses on the quantification of the regional impact associated with subsectors of local food production – including specific direct markets – as well as the shift of systems toward increased local consumption. While there is much evidence suggesting that the promotion of local food systems could be part of an effective strategy for regional development, some researchers call for more rigorous tests of this theory (Thilmany & Watson, 2004; Fischer et al, 2013; Aubrey, 2012; O’Hara & Pirog, 2013).

Generally, more research is needed to show the links between local food production and economic development (O’Hara & Pirog, 2013).

Economic Impact Analysis

The production of fruits and vegetables, as well as dairy, even if not restricted to local sales, generates strong positive benefits to a regional economy in terms of annual output, gross state output, employment, and labor income (a farmer’s annual income after business expenses and capital interest charge are subtracted). The greatest economic impact from the production of fresh produce derives from the direct effects – the impacts from sales of the products. The indirect effects (the impacts from purchases of inputs from regional suppliers) and the induced effects (the impact of consumption expenditures of employees) are generally smaller, but their relative levels vary by

region and category of productive output (O'Hara & Parsons, 2012; Swenson, 2009; Tootelian & Mikhailitchenko, 2012.)

While most research tends to support the theory that local food production fosters positive regional economic growth and development, there is some preliminary evidence suggesting that the relationship may not be so clear. Deller and Brown (2011), for example, find a weak relationship between local food production and community economic growth and development. On the other hand, agricultural production and purchasing, without a local focus, caused an outflow of dollars from a region in Minnesota in the late 1990s (Meter & Rosales, 2001).

Farmers markets

Research shows that farmers markets positively affect regional economies. Otto and Varner (2008) and Henneberry, Whitacre, and Agustini (2005) find that sales from farmers markets multiply throughout the economy and cause net benefits in personal incomes and jobs. These studies show that the direct effects of farmers market activities have the greatest impact on sales, personal incomes and jobs, while the induced effects generally have a slightly greater economic impact than the indirect effects (Henneberry et al., 2005; Otto & Varner, 2008). Even when accounting for displaced spending in other retail outlets, Hughes, Brown, Miller, and McConnell (2008) demonstrate that farmers markets can display positive economic impacts. In addition, Lev, Brewer, and Stephenson's 2003 analysis reveals that farmers markets draw consumers to central business centers and encourage additional spending at neighboring businesses. This research demonstrates a substantial positive impact from farmers market activity on regional economies, as measured by output, jobs, income, and spillover effects.

Import Substitution Modeling

Import substitution is the most direct avenue through which local food system expansion can affect regional economies. Replacing a certain portion of a region's food imports with locally produced food is expected to boost sales revenue for businesses, household and consumers in the region. Studies projecting expansion of the local food system find that import substitution is associated with increased output, higher labor incomes, and more jobs, even within the confines of seasonal supply.

Sales, jobs, and labor income

Swenson's analysis (2009), using input-output models for two scenarios of import substitution in Iowa, predicts net regional gains in output, labor income, and additional jobs. In a similar study of a six-state region in the Upper Midwest, Swenson (2010) estimates that expanding local production of fruits and vegetables to meet demand would result in substantial growth in retail sales, jobs, and labor incomes. These figures are significantly higher than outputs generated through conventional commodity agriculture. Conner, Knudson, Hamm, and Peters' input-output modeling (2008) is also consistent with these findings. They estimate the economic impacts under a scenario where Michigan residents increase local food consumption to meet USDA fruit and vegetable consumption guidelines. Their findings predict that increasing local food consumption would result in a net increase of jobs and income (Conner et al., 2008).

Meter's analysis (2011) of the Ohio farm economy estimates that if 15 percent of household vegetable consumption was sourced directly from Ohio farmers, the state would generate an extra \$2.5 billion in farm income. Similarly, Cantrell, Conner, Erickcek, and Hamm (2007) project that shifting existing produce sales to direct markets would generate substantial economic benefits, including increases in jobs, personal income, and net revenues for farmers. These findings indicate that transitioning portions of the agricultural sector toward production of fresh produce for local

consumption and expanding local food sales through direct markets can help keep agricultural dollars within the region and strengthen the local economy.

Impact of farm-to-school programs

Input-output models indicate that increased consumption of local foods through farm-to-school programs can have a positive impact on a local economy in terms of output and labor income. Both Gunther and Thilmany (2012) and Tuck, Haynes, King, and Pesch (2010) support this finding, although the degree of impact varies widely depending on the parameters of the scenarios. Notably, Tuck et al. (2010) found that while higher price scenarios for farm-to-school programs would generate the highest direct impact, the lowest-price scenarios would produce the greatest ripple effects (indirect and induced effects) and therefore carry the greatest potential economic impact for the community.

Models for Assessing Economic Impact

Input-output analysis, as provided by IMPLAN, is a tool that models the extent to which the values of goods supplied or demanded in the local food sector affect other industries that supply inputs to or demand outputs from the sector. The analysis generates economic multipliers that measure the potential ripple effect of these economic activities in the local or regional economy; “ripples” include job creation, income growth, or increased tax revenue. Input-output modeling is the preferred model for economic impact analysis of local and regional food systems, as reflected by the strong reliance on this tool among researchers of local food systems (Otto & Varner, 2005; Hughes et al., 2008; Henneberry et al., 2009; Tuck et al., 2010; Swenson, 2011).

While input-output analysis provides a useful snapshot of the broad economic benefits of local food systems, there are other approaches for assessing the relevance of local foods that may offer a more comprehensive assessment. For example, Lev et al. (2003) determined the significant additional downtown sales – spillover effects – realized by businesses near farmers markets that an input-output model would not capture. Other approaches include stakeholder networking, modeling exogenous effects on demand and supply relationships; examining social capital impacts on economic development; using alternative input-output models – such as the Regional Input/Output Modeling Systems (RIMS); tapping relative price flexible models such as Regional Economic Models (REM); keeping a closer focus on the production characteristics of local systems; and utilizing approaches that emphasize sociological benefits over economic results (Pirog, 2013).

FUTURE RESEARCH NEEDS AND STRENGTH OF RESEARCH METHODS

Despite the extensive body of literature on local food systems, there are still a number of gaps in the current understanding of the economic aspects of local food systems. These gaps indicate a need for further research about the economic impact of local food production, distribution, and marketing. Some of the prominent gaps identified by experts in the field are listed below.

- There is still some uncertainty about the precise relationship between economic development and various aspects of local food systems. Thilmany and Watson (2004) make the case for further research on the relationship between direct marketing strategies and local economic development. Fischer and colleagues (2013) identify a need for more evidence on the economic impact of food hub operations. Meanwhile, Deller and Brown (2011) argue that the underlying premise of local food production as a viable strategy for economic development has not been tested with adequate rigor. Despite the publication of many studies analyzing the impact of local and regional food markets, it is difficult to use this collection of investigations as a basis for larger conclusions, according to Pirog and O'Hara (2013). It is clear that to better understand the exact nature of these relationships,

experts require additional research on local food markets and regional economic development. It is likely that this will require alternative models and analysis. For example, greater accuracy in food hub feasibility studies will require more reliable and standardized data and analysis models than are currently available (Aubrey, 2012).

- Imbalanced markets, where demand appears to exceed supply, are found throughout the country. Economic theory suggests that excessive demand will drive up prices – drawing more supply and perhaps more suppliers to the market, thus eventually driving prices back down. Some scholars anticipate that more commercial, less “local” producers will step forward to address these market openings (Pansing et al., 2013). Others question whether local producers are even interested (Karnitz et al., 2013). Thus, Schneider and Francis (2005) encourage additional research about the potentially restrictive role of market barriers in limiting local food system development. Schneider and Francis also highlight a need to better understand producers’ capacity to meet local demand. Overall, additional research is needed to determine how common this lopsided market dynamic is throughout the country, and why these markets seem so slow to self-correct.
- For many producers, the desire to develop social and community connections drives their participation in direct-to-consumer markets (Hendrickson et al., 2013; Tegtmeier and Duffy, 2005; SHIP, 2005; and Hultberg, 2011). For some consumers of fresh produce at local markets, social interaction is part of the draw (Hunt, 2007), perhaps helping build trust between growers and their customers (Diamond and Barham, 2012). Further investigation into these relationships could provide useful insights on strategies to better promote social components of local food markets.
- Research in Missouri suggests that some consumers want fresh, local food and recognize its value but might not be willing to pay for it (Brown, 2003). Surveys in other states underscore the loyalty of direct market consumers and the fact that, for many, price is not the most important factor in making a buying decision. More research may provide additional insights into consumers’ willingness to pay for local produce and help determine how education and messaging may encourage higher willingness to pay.

Improving links

Drawing on recent input from academic and professional food system economists and researchers, O’Hara and Pirog (2013) identify future research priorities within the sector. They specifically focus on economic impact analysis, noting that a variety of factors limit the ability of scholars to draw “overarching conclusions” from research undertaken to-date. The authors targeted the following opportunities to improve the links between local foods and economic change and development, while establishing better research methods:

- Improving data collection about local food production and consumption.
- Expanding the geographic scale of food systems impact analysis, particularly when linked with regional dietary changes.
- Looking beyond the typical impacts associated with regional economic analysis, such as jobs and income, to include other metrics – such as spillover effects from farm markets and measurement of improvements in local social capital.

Assessment of research methods

O'Hara and Pirog (2013) also identify some of the design and methodology challenges facing scholars analyzing the economic impact of local and regional food systems. We (the author and contributors) generally concur with their findings and add our own concerns:

- There are no universal multipliers or ratios for estimating the direct impact of local food sales. Job and income multipliers are project- and region-specific – they emerge from existing data and careful assumptions related to the use of input-output and other regional economic analysis models. Using multipliers from existing studies completed in other locations with different inter-industry linkages and value-chain networks is not a sound basis for estimating economic impact.
- As researchers, when we assume that local or regional food supply will supplant an existing supply shipped from outside the study area, we need to allow for the replacement of jobs and other benefits already being realized because of that existing supply. What are the net impacts of developing local production?
- Related to the preceding point, the import substitution (IS) approach allows researchers to “try on” new scenarios. This is a useful construct as local and regional food potential develops around the country. But assuming local supply and creating it are two different endeavors. We need a better understanding of the factors that support actual import substitution as an economic development strategy. If there are benefits to developing local and regional food systems, what are the program elements that allow local production to replace produce from California or Mexico, for example? Local food proponents in different parts of the United States are developing plans and programs to promote IS implementation. We can learn from their efforts. If local food system development proves to be an effective economic development tool, what benchmarks can researchers use to measure this effectiveness? And how can communities use these metrics to inform policies – at different levels of jurisdiction – that help food systems grow?
- Online surveys, and other less formal information-gathering tools, can provide useful information with one caution: The assumptions behind these methods, and the potential for generating self-selecting samples and biased results, should be clearly stated in any research publications.

Finally, O'Hara and Pirog (2013) recommend that a “national learning community of economists, local food researchers, and others who view local food as a means to community economic development should be formed to review and critique the design, methods, and conclusions of studies that examine their social, economic, and environmental impacts.”

ANNOTATED BIBLIOGRAPHY

Adams, D., & Salois, J. (2010). Local versus organic: A turn in consumer preferences and willingness-to-pay. *Renewable Agriculture and Food Systems*, 25(4), 331-341.

Adams and Salois trace the change in consumer perceptions and willingness to pay for local and organic food over recent decades – as documented in existing literature. Their review shows that prior to the late 1990s, studies on organic agriculture found that consumer motivation factors related strongly to environmental protection and consumer health but showed little relation to supporting local communities or protecting farm workers. Studies focusing on food origin at this time often found that consumers were far more concerned with the quality, price, and appearance of the product than with where it was produced. After the late 1990s, the authors identify a turning point in which studies show consumers

express a preference for buying local, organically grown foods. Indeed, many studies in the '90s began to show a consumer preference for local produce ranking higher than that for organic produce.

Starting in the '90s, many studies also found that the preferences for local food were associated with high willingness to pay. This shift in demand from organic to local coincided with the development of federal organic standards, through which organic agriculture shifted toward industrialized production processes resulting in an "organic lite" industry largely stripped of its original social and ecological benefits. The local food movement represented a reclaiming of the original holistic and authentic social and political values of the by then watered-down organic movement; today local foods are seen as preferable to buying industrialized organic foods.

Abatekassa, G., & Peterson, H. C. (2011). Market access for local food through the conventional food supply chain. *International Food and Agribusiness Management Review*, 14(1), 63-82.

Abatekassa and Peterson's study explores the relationships and linkages between conventional food buyers and local food in Southeast Michigan, from the perspective of conventional food retailers and wholesalers. The study follows a qualitative case study methodology, conducting semi-structured interviews with 11 retailers (which include a supermarket chain store, independent grocery stores, and convenience stores) and six wholesalers (which include a national wholesale distributor, ethnic-based wholesalers, a wholesale-retail operation, and a producer-packer-shipper) in a six-county region. While the analysis revealed a common acknowledgement of the value and desirability of local food, it also showed discrepancies in perceptions about the conceptualization and definitions of "local" food among supply chain actors. The authors argue that these differing perceptions signal a degree of uncertainty for supply chain actors in sourcing local foods and highlight the challenges of analyzing local food systems.

The cases in Abatekassa and Peterson's study also show that the independent retailers had more experience sourcing local food than the supermarket and wholesale chains. However, the study also shows that the quantity of food sourced was small due to several factors, including store size, product quality and logistical issues, and concerns about liability and food safety. Among supermarkets and wholesalers, most expressed interest in purchasing local produce, but the absence of appropriate intermediary actors to aggregate and deliver a high volume of local food is the primary constraint for sourcing more local foods. Local food producers may have an opportunity to increase market share by assuming more value-added functions in the supply chain. Another key finding of the study is that supplier selection criteria - including price, volume and quality - are not the only factors determining successful integration of local food into conventional supply chains. Other important factors include trust, reliability, and information sharing. Thus, market access for local products in conventional supply chains would likely benefit from improvements in information sharing capacity and the establishment of trust-based relationships.

Aubrey, S. (2012, August). *Indiana farms, Indiana foods, Indiana success: Central Indiana food hub feasibility study*. Monrovia, IN: Prosperity Ag and Energy Resources. Retrieved from <http://ngfn.org/resources/ngfn-database/knowledge/8-20-12%20Central%20IN%20Food%20Hub%20Feasibility%20Study.pdf>

Aubrey assesses the feasibility of a food hub in central Indiana in order to inform decision making for a local steering committee near Hancock County, Indiana. The analysis uses data

gathered from interviews with producers, distributors, public officials, and county health officials throughout Indiana in 2012, as well as secondary market data. The study found growth trends in the number of small farms in the region, an increasing number of new farmers – particularly young farmers who report lower direct sales income – and a significant amount of production acres devoted to specialty crops that are exported out of state. The author found a significant market gap in the coordination of local product (which is produced at sufficiently high volumes) to meet local demand.

Therefore, the author identifies an opportunity to coordinate the aggregation of Indiana-grown product and convert much of the current export sales to local sales. Given this market context and trends in farm production, Aubrey's analysis determines that a food hub is feasible under certain conditions and under certain courses of action. The analysis finds initial costs of \$537,000 to rent, equip, and staff a warehouse and to finance startup and site development for a virtual food hub (one which uses an online resource as organization tool).

Despite the findings of feasibility, Aubrey warns against proceeding too quickly or promoting too large a project because of potential problems sustaining the project beyond initial funding due to low initial product volume. Aubrey recommends starting the project with coordination of producer aggregation and sales of known products to existing channels where demand is known.

Regarding food hub research in general, Aubrey cites an inconsistency in calculating the number of acres required to supply a specific volume of sales. She identifies a need for additional research to determine a more universally accepted model for calculating these figures to ensure accuracy in food hub planning and analysis. While generally optimistic about the potential of food hubs to improve market gaps in local food systems, Aubrey's analysis offers a tempered assessment of the feasibility of the approach and realistically considers potential impediments to success.

Agriculture Utilization Research Institute. (2009). *Marketing study of opportunities for foods grown locally or sustainably in Minnesota* (Report sponsored by Agriculture Utilization Research Institute and Minnesota Farmers Union). Retrieved from <http://www.auri.org/wp-content/assets/legacy/research/Local%20foods%20market%20report.pdf>

This report investigates opportunities for increasing sales of locally and sustainably produced food in retail and service sector markets in Minnesota. The analysis relies on data from industry sources and from interviews with farmers, distributors, retailers, and food service representatives. Acknowledging the growing demand for local and organic food within wholesale markets (retail and foodservice industry), the report focuses on the challenges that Minnesota growers face to meet these demands. Through the interviews, the authors identified six key requisites that will help local growers penetrate wholesale markets. These include 1) maintaining a consistent supply of high-quality food products, 2) maintaining strong communication with wholesale operators, 3) extending the season for produce, 4) possessing liability insurance of at least \$2 million, 5) implementing a Hazard Analysis Critical Control Point plan for food safety, and 6) developing a marketing plan for food products. The authors also describe seven key requisites for selling to distributors: 1) maintaining a reliable supply of food products, 2) offering a variety of local products according to market demand, 3) extending the season, 4) aggregating supply, 5) having strong initial processing and post-harvest capacities, and 6) meeting food safety requirements. These lists of factors provide a sense of what local growers need to do to strengthen their ability to gain access to wholesale markets.

Bailey, J. (2013). *Regional food systems in Nebraska: The views of consumers, producers and institutions*. Lyons, NE: Center for Rural Affairs. Retrieved from <http://files.cfra.org/pdf/ne-food-systems-report.pdf>

Bailey presents findings from a 2013 survey on perspectives of local food system issues from consumers, producers and institutions in Nebraska. A total of 375 contacts on an email list maintained by the Center for Rural Affairs in Lyons, NE, completed the survey. The non-random sample included 300 respondents who had self-identified as consumers. The findings reveal a strong interest in local foods among household consumers, with most patronizing farmers markets. Despite this strong interest, many participants expressed frustration with the limited product choices, business hours, and locations. Household consumers responding to the survey also indicated that high prices of local foods prevented purchases.

The analysis further found distinctions among types of consumers. Consumers with high awareness of where and what types of local foods were available for purchase were also more aware of the economic and social benefits of local foods. However, “normal shoppers” with low awareness of local food availability were unaware of reasons to support local food markets and were less likely to purchase local food without more strategic awareness campaigns.

Institutional respondents expressed interest in purchasing local foods, but perceived substantial barriers to doing so. Perceived barriers included high cost, limited seasonal availability, overall lack of adequate supply (in all seasons), and burdensome liability and insurance issues. They also noted that the current food purchasing system is conveniently streamlined through distributors.

Barham, J., Tropp, D., Enterline, K., Farbman, J., Fisk, J., & Kiraly, S. (2012). *Regional food hub resource guide*. Washington, DC: Agricultural Marketing Service, U.S. Department of Agriculture. Retrieved from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5097957>

This guide provides an overview of the concept of regional food hubs and looks at their impact and economic viability, as well as barriers to their growth. The guide includes data from several recent studies, surveys, and reports, as well as a 2011 survey of regional food hubs conducted by the National Food Hub Collaboration. The survey’s findings show that food hubs can have a substantial positive economic, social, and environmental impact in their communities. Food hubs are shown to provide opportunities for more local food procurement at a greater scale, which serves to create jobs, generate business taxes, and increase earnings throughout a region. The survey also demonstrates that food hubs increase market access for local producers – particularly smaller operations challenged by the lack of appropriately scaled distribution and processing infrastructure.

Research reported in the guide says that regional food hubs add considerable value to existing food distribution systems by, for example, reducing transaction costs for institutional and retail buyers to purchase local produce. Regarding the economic viability of the model, the 2011 survey of regional food hubs found that 50 percent of participating food hubs were economically viable businesses (with sales revenue exceeding operating costs) and an additional 25 percent were very close to achieving viability. Most of the food hubs contacted for the 2011 survey were startups or in an early development phase, generating an average of nearly \$1 million in gross sales annually. Interviews with key players revealed the following persistent challenges for food hubs: balancing supply and

demand (specifically gaps in supply), overcoming wholesale food buyers' resistance to paying a price premium for local foods at a food hub, managing growth to keep pace with market demand, and finding ways to access capital. Overall, the guide consolidates a great deal of literature to provide a useful overview of the potential benefits of food hubs, which are presented in an optimistic light.

Berkenkamp, J. (2012). *Grower perspectives on farm to school: A survey of interested farmers, ranchers and other producers*. Minneapolis, MN: Institute for Agriculture and Trade Policy. Retrieved from http://www.iatp.org/files/2012_03_16_F2S_ProducerSurvey.pdf

Berkenkamp presents findings from a survey of Upper Midwest producers on their perceptions of farm-to-school opportunities, aspirations, challenges, and strategies. A total of 101 farmers and producers completed the survey, responding to a request to participate sent through newsletters, email lists, and blogs. Most respondents are from Minnesota and Wisconsin, with several from Iowa, North Dakota, and South Dakota. The results show that nearly half of respondents (46 percent) generate less than \$25,000 in gross annual revenue from agricultural production, about 25 percent generate between \$25,000 and \$100,000, and about 20 percent make between \$100,000 and \$5 million. Regarding markets, about 90 percent of survey respondents reported selling directly to consumers, 28 percent said they sold to K-12 schools, and 20 percent reported marketing to other institutions. About 14 percent sell to some type of distributor and another 14 percent to collaboratives or cooperatives.

Among respondents selling to schools, the vast majority (81 percent) sold less than \$5,000 worth of produce. Among respondents selling to schools, most reported receiving similar (60 percent) or lower (26 percent) prices from K-12 schools relative to other buyers. The most common motivations for selling to schools are to educate children about the food system and where their food comes from (87 percent); to increase access to healthy, locally grown food (84 percent); to build relationships with the community (84 percent); to help diversify market outlets (60 percent); and to gain a new revenue source for the farm (57 percent).

The most commonly cited challenges to selling to schools were: a disconnect between the seasonality of products and schools' ordering schedule (45 percent), difficulties for smaller producers to guarantee a specific quantity on a specific date (38 percent) or to meet schools' large-volume orders (24 percent), and difficulties for the school" price - too low - (35 percent). About 54 percent of respondents were "very interested" and 35 percent were "somewhat interested" in selling to K-12 schools in the future. However, a significant majority (87 percent) reported that they were very or somewhat interested in growing products for a school only if that school committed to buying the produce in advance.

Bernard, S. (2012). *Consumer motivations and barriers towards purchase of local beef*. (Master's thesis). Retrieved from K-State Electronic Theses, Dissertations, and Reports (Accession No. 2012-07-02T19:00:43 Z)

This master's thesis investigates the key motivations and barriers to consumers' purchase of local beef. The analysis relies on consumer data collected through an open online survey in which respondents were recruited from a convenience sample (easy-to-reach respondents). Of the total 447 respondents who began the survey, 417 completed it and were included in the analysis. The findings show that the most important motivating factor for the purchase of local beef is the desire to support local farmers and agriculture. About 93 percent of respondents agreed that this was the most important factor in motivating them to make the

purchase. The next most important factors, in descending order, were environmental benefits, humane treatment of cattle, health benefits, and taste. Female respondents agreed to all motivating factors at a greater (and statistically significant) rate than male respondents.

Regarding barriers to purchasing local beef, findings revealed that the strongest barrier was price –local beef is more expensive than beef imported from outside the community. The next most common barriers, in descending order, were failure to satisfy specific preferences, such as a desire for a particular grade of meat or a certain percent leanness; inconvenience factors, such as the unavailability of local meat at usual shopping venues; unfamiliar brand and lack of labeling; and quality factors, including inconsistent or unknown quality. Respondents who had bought local beef before taking the survey did not think listed barriers were as prohibitive as respondents who had never purchased local beef. Because respondents were recruited from a convenience sample, findings cannot be generalized.

Bond, J.K., Thilmany, D., & Bond, C. A. (2006). Direct marketing of fresh produce: Understanding consumer purchasing decisions. *Choices*, 21(4), 229-236.

Bond et al. present key findings from a national survey of household consumer purchasing habits for fresh produce. They used data collected from a 2006 online survey with 1,549 respondents, representing a response rate of about 49 percent. Regarding motivations for choosing specific locations for purchasing fresh produce, most respondents indicated highest concern for superior products, safety, and price. Consumers who indicated direct purchasing as their primary source for produce (“direct consumers”) expressed a greater concern for variety and support of local growers than other consumers. Regarding production factors, all consumers regard pesticide-free production as the most important attribute. For direct consumers, the next-most important production attribute was being locally grown. For the other consumers, the second-most important production attribute was country of origin. Being organically grown was found to be the second-to-least important production factor for all consumers (before relationship with producers).

Asked to name intrinsic attributes of produce, all consumers ranked firmness and texture as the most important. In terms of value and convenience, all consumer groups ranked price value as the most important attribute (over brand, preparation convenience, and packaging). Overall, findings from Bond et al. show that consumers who express an interest in direct purchase of produce place great value on variety and safety, as well as the ability to support local farmers. However, these consumers place less importance on convenience, aesthetics, and competitive prices than the average consumer.

Bond, J.K., Thilmany, D., & Bond, C. (2009). What influences consumer choice of fresh produce purchase location? *Journal of Agricultural and Applied Economics*, 41(1), 61-74.

Bond et al. investigate the differences among consumers according to where they buy fresh produce. Specifically, their analysis groups consumers into three categories: those who always purchase from direct markets, those who occasionally purchase from direct markets (seasonally and as a secondary source), and those who never purchase from direct markets. Using a national dataset of consumers of fresh produce, the authors collected 1,549 usable surveys – representing a 48.9 percent response rate. The findings show that respondents in the “direct always” and “direct occasional” groups placed greater value on locally-grown than safety attributes

Further, the probability of a respondent preferring to purchase “direct always” or “direct occasional” increases as the consumer places greater importance on freshness. These groups also have a stronger preference for fresh, unprocessed food relative to those in the “direct never” group. Respondents in the direct never group place more importance on the convenience of purchase location. The authors argue that to maintain and increase sales from current direct consumers, markets should emphasize the availability of local, fresh, unprocessed produce that supports local business. They may also increase accessibility and aesthetic appeal of farm stands and farmers markets to encourage consumers who have no preference for direct markets.

Borst, A. (2008). Farmers, co-ops and local marketing. *Rural Cooperatives*, 75(5), 10.

This study presents a review of the market channels that distributed local foods at the time of the research (2008). The review describes the substantial growth in local food outlets, including farmers markets and consumer-owned food cooperatives throughout the country. For example, the USDA reported that farmers markets expanded from 1,755 in 1994 to 4,385 in 2006. In addition, the National Cooperative Business Association estimated at the time this study was published that there were more than 500 food cooperatives in the United States. Apart from farmers markets and food cooperatives, newer business models to market local foods have emerged with great momentum. These include CSA operations, restaurant and institutional food services, and virtual farmers markets, as well as mainstream channels such as supermarkets. While these market channels are not quantified in this review, the paper offers a basic sense of the market landscape for local food.

Bregendahl, C., & Enderson, A. (2013). *2012 economic impacts of Iowa's Regional Food Systems Working Group*. Ames, IA: Iowa State University Leopold Center for Sustainable Agriculture. Retrieved from <https://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2013-11-2012-economic-impacts-iowas-regional-food-systems-working-group.pdf>

Bregendahl and Enderson present results from an evaluation of the impact of local food production on Iowa's economy in connection with the efforts of the Regional Food Systems Working Group (RFSWG). The analysis relies on survey data from local producers and institutional food purchasers across the 15 RFSWG regions. The findings show that the 103 responding farmers reported over \$10 million in local food sales in 2012, and the 74 responding buyers reported almost \$9 million in local food purchases in 2012. A subset of farmers and buyers reported that 36 new on-farm jobs had been created in 2012 as a result of local food production, and 17 new jobs as a result of local food purchasing. Bregendahl and Enderson calculate that for each \$1 million in local food sales, 7.7 FTE farm jobs were supported.

Brown, C. (2003). Consumers' preferences for locally produced food: A study in southeast Missouri. *American Journal of Alternative Agriculture*, 18(4), 213-224.

Brown investigates household interest in purchasing locally produced foods in southeast Missouri. The study surveyed a random sample of households using mail-surveys, with 544 total responses representing a 41 percent response rate. The findings show that quality and freshness were the most important concern of consumers while shopping for fresh produce. Price was the next important factor, and the origin of product was of least concern to consumers. Respondents concerned with quality and freshness were also more likely to seek out local products. Most respondents (73 percent) considered produce from farmers markets

of higher quality compared with food purchased from grocery stores, and 43 percent considered the prices to be lower.

As for willingness to pay for locally produced foods, 14 percent would only purchase locally grown and raised foods if the prices were lower than non-locally sourced foods; 16 percent would purchase local product at a 5 percent higher price, 5 percent would pay 10 percent more, and 1 percent would pay a 25 percent higher price for a local product. Those respondents who were willing to purchase local foods for higher prices were more likely to be female, to have been raised on a farm or had parents who were raised on a farm, to be members of an environmental group, to have annual household income of \$50,000 or higher, and to have a graduate or professional degree. Regarding consumers' conception of "locally grown," most respondents understand it as a regional concept not necessarily corresponding with state boundaries. Only 12 percent considered products from anywhere in Missouri to be "locally grown." Overall, the results point to the importance of emphasizing quality and competitive pricing in the marketing of local foods.

Cantrell, P., Conner, D., Erickcek, G., & Hamm, M. (2006). *Eat fresh and grow jobs, Michigan*. Beulah, MI: Michigan Land Use Institute. Retrieved from <http://www.mlui.org/userfiles/filemanager/274/>

This report investigates the direct economic impact benefits of increasing sales of produce in direct and wholesale markets in the state of Michigan. This analysis does not consider increased production, but simply the impact of changing end markets (shifting existing produce sales to direct and wholesale markets instead of to processors). The study considers six scenarios. The scenarios include two levels of sales increases to direct and wholesale markets, which are then matched with three assumptions regarding the percent of sales caused by increased demand. The analysis uses existing market data from the National Agricultural Statistics Service and a customized REMI tool to construct a model of the potential changes. The estimates show that shifting sales toward direct and wholesale markets could produce up to 1,889 additional jobs and up to \$187 million in additional personal income throughout the state. Further, the analysis shows a potential increase in net revenue gains of up to \$164 million for farmers. The study assumes that to achieve such potential gains, a comprehensive statewide program will be required. The authors offer recommendations regarding implementation of a statewide program that calls for an economic development investment of \$9.5 million, or \$5,000 per potential job. Such a program would implement changes in policy and programs related to production, marketing, storage, packing, and distribution.

Carpio, C.E., & Isengildina-Massa, O. (2009). Consumer willingness to pay for locally grown products: The case of South Carolina. *Agribusiness*, 25, 412-426.

Carpio and Isengildina-Massa present findings on consumers' willingness to pay for locally branded products in South Carolina. The authors use data collected through a random telephone survey of consumers that included questions based on theoretical prices. The findings show that if food products were equally priced, 95 percent of consumers would choose state-grown produce over out-of-state produce. If there were a 5 percent premium on local produce, 78 percent of consumers would still purchase state-grown produce. With 30 percent price premiums, about 50 percent of consumers would purchase state-grown produce. Overall, the calculations reveal that the average willingness to pay for state-grown produce was a 27.5 percent premium over out-of-state produce, and 23 percent premium for animal products.

The results also show that consumers whose local purchases are motivated by supporting local farmers or the local economy had a higher willingness to pay a premium (additional 4.2 percent for produce and 3.3 percent for animal products) relative to consumers who were motivated by quality and price. Further, consumers who perceive local products as being of higher quality than non-locally produced foods were willing to pay an 11 percent premium for produce and a 6.5 percent premium for animal products. These results are expected to vary over time and across states, where the authors assume consumer perceptions and willingness to pay is influenced by campaigns to support local foods.

Colasanti, K. J., Matts, C., & Hamm, M. W. (2012). Results from the 2009 Michigan Farm to School Survey: Participation grows from 2004. *Journal of Nutrition Education and Behavior*, 44(4), 343-349.

Colasanti et al. present results from a 2009 survey of local food purchasing behavior and interests among school foodservice directors in Michigan; they compare the 2009 results to findings from a similar 2004 survey. The survey was distributed electronically to all Michigan institutions participating in the USDA National School Lunch Program. A total of 270 schools completed the survey, representing a response rate of 28.4 percent. The analysis finds that participation in farm-to-school programs had increased by more than threefold from 2004 to 2009; specifically, in 2009, 42.5 percent of school districts reported purchasing foods from local farmers in the previous year. Of the districts that had not purchased from a local farmer in the previous year, most (57.9 percent) expressed interest in doing so. Survey respondents expressed greatest interest in purchasing fresh and whole foods from local farmers, as opposed to processed or frozen foods. If price and quality were competitive and there was an available source, about 70 percent of respondents said they would purchase local food, compared to 73 percent who said that in 2004.

According to the study by Colasanti et al., the leading motivations for purchasing local food in 2009 were helping Michigan farms or businesses (87 percent), higher quality food (83.9 percent), and supporting the local economy (83.8 percent). The top concern about buying local foods was cost in both 2004 and 2009, with cost ranked either as a great concern (88.6 percent), or of some concern (11.4 percent) in 2009. Other common concerns were quality, reliable supply, food safety, and seasonal availability. Respondents indicated that the following factors would greatly influence their purchasing of local food: assurances of food safety, financial incentives, more partially or minimally processed products, and regulations that make it easier to buy directly from farmers.

Conner, D., Colasanti, K., Ross, R. B., & Smalley, S. B. (2010). Locally grown foods and farmers markets: Consumer attitudes and behaviors. *Sustainability*, 2(3), 742-756.

Conner et al. examine Michigan consumers' attitudes and behavior related to buying local foods and farmers markets. The analysis relies on data from 953 interviews collected through a representative statewide telephone survey in 2008. The data show that most respondents had purchased locally grown food in the last month (74.8 percent) or had visited a farmers market in the last year (61 percent). The most important reasons given for shopping at farmers markets were food quality, safety from foodborne illness, and the ability to support local farmers. The least important factors interviewees reported were the availability of pesticide-free or hormone-free foods.

The data reveal that the greatest opportunity for increasing local food buying is better identification of locally grown food to counter perceptions of a lack of availability of local

foods, which respondents identified as the greatest barrier to buying local foods. Very few respondents viewed higher cost of local foods as a significant barrier. The analysis also found differences among demographic groups. For example, white people and those with higher incomes were less likely to see value and convenience as important factors for shopping at farmers markets, while Latino people and part-time workers were more likely to view these as important factors. The results show significant differences in attitudes and behavior of Latino consumers, who place higher value on the availability of a variety of products (particularly hormone-free animal products) and on access to information about how the product was produced. The findings of this study demonstrate a general high participation in farmers markets fueled by a demand for high-quality locally grown foods, but limited by lack of convenience.

Conner, D. S., Knudson, W. A., Hamm, M. W., & Peters, H.C. (2008). The food system as an economic driver: Strategies and applications for Michigan. *Journal of Hunger & Environmental Nutrition*, 3(4), 371–383.

Conner et al. measure the impact on incomes and jobs if Michigan residents were to meet USDA fruit and vegetable consumption guidelines by eating more seasonally available locally grown fresh produce. The analysis is based on USDA, Census, and Michigan Extension data, and uses an IMPLAN input-output modeling system. The authors' findings predict that increasing local food consumption to meet USDA dietary standards would result in a net of increase of 1,780 jobs and a total net increase of \$211 million in income in the state. Of this amount, increased sales in fruit would account for 529 jobs and \$42.4 million in income, while increased vegetables sales would account for 1,251 jobs and \$169.1 million in income.

Dane County Planning and Development Department. (2011). *Southern Wisconsin food hub feasibility study*. Retrieved from <http://www.ngfn.org/resources/ngfn-database/knowledge/SoWisFoodHubStudy-HR.pdf>

In this study, the Dane County (WI) Planning and Development Department assesses the financial feasibility of a food hub designed to connect southern Wisconsin producers to buyers in the same area and in northern Illinois. The analysis uses data from online and mailed surveys that measure interest among producers and buyers in participating in a food hub. The researchers then evaluate potential business and revenue models, as well as facility scale. The study also includes financial analysis using a pro forma profit and loss statement to predict whether a food hub could operate at a profit. The inputs for the financial analysis came from the surveys and from existing food hubs' operating data.

Regarding the potential scale of a food hub, the survey revealed a demand from buyers of up to 800,000 pounds per week – yielding sales of \$18-26 million a year and requiring about 1,800 acres of production. The survey also documented a willingness among participating producers to devote 1,000 acres to the food hub – 700 acres of which were offered by producers with the highest level of interest. As a result, the analysis scales the facility to these 700 acres, suggesting a facility size of 25,500 square feet with a processing capacity of 12 million pounds a year. This could meet about 40 percent of customer demand.

The financial analysis predicted such an operation would generate net incomes of \$637,000 in the potential sales area, as well as \$708,000 in additional sales for farm operations. Such a facility would have potential to generate annual sales of \$20 million at full capacity with use of seasonal extension strategies. The greatest risks for the feasibility of the food hub relate to supply – stemming from the possibility of a lack of producer interest to supply the

volume of foods required for efficient operations. Study authors predict a number of substantial economic and social benefits to Dane County from the food hub, including the creation of new jobs, providing new markets for up to 50 family farms, increasing farm revenue from \$900,000 to \$1.8 million, and injecting up to an additional \$60 million into the local economy.

Deller, S., & Brown, L. (2011). *Local foods and community economic growth and development*. Madison, WI: Department of Agricultural and Applied Economics, University of Wisconsin-Madison/Extension.

Deller and Brown construct models using data from the 2002 Census of Agriculture to test the relationship between the growing local food market and community economic growth and development. The authors assessed conditions by county across the United States and found that higher local foods activity is associated with higher levels of population growth. The authors' analysis showed lower levels of income growth and no influence on employment growth. For non-metro counties, higher local foods activity was associated with higher levels of population and employment growth, but lower levels of income growth. For metro counties, the authors found no relationship between higher local foods activity and employment and income growth. Overall, the authors argue that their preliminary findings signify weak evidence that promoting local foods supports community economic growth and development in either non-metro counties or metro counties. While results vary according to the metric of economic growth, most of the authors' statistical findings support a limited relationship between local foods and community economic growth and development. The authors emphasize that the results are exploratory and very preliminary.

Diamond, A., & Barham, J. (2012). *Moving food along the value chain: Innovations in regional food distribution* (No. 145618). Washington, DC: Agricultural Marketing Service, U.S. Department of Agriculture. Retrieved from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=stelprdc5097504>

Diamond and Barham investigate local food value chains to better understand the role of mission-oriented food distributors in resolving common distribution challenges related to connecting local demand with local supply in regional food markets. The study uses a longitudinal case study methodology, for which the authors studied eight food distributors over the course of three years using semi-structured interviews, site visits, and document review. The organizations under study are each involved in various aspects of aggregation, distribution, and marketing of local food, representing four distinct distribution models — retail-driven, non-profit driven, producer-driven, and consumer-driven — at varying stages of development.

The analysis revealed four themes across distribution in local food systems. First, there is a strong need to preserve the integrity of product differentiation or identity such as origin, variety, and production practices from farm to market. The researchers conclude that distributors need to build an identity preservation system to help uphold marketing claims and establish appropriate negotiation status with buyers. This is increasingly important when there is less social connection or trust between consumers and sellers. Second, using existing informal farmer networks or setting up new ones is shown to be an effective strategy to meet shifting demands of local food markets that are often highly diversified and specialized. Farmer networks give farmers greater flexibility in what they sell to a network than does an agricultural cooperative. Third, the researchers recommend adapting nonprofits and cooperatives to leverage their unique capacities in value chain activities.

These capacities can be enhanced through partnerships with other actors to provide training, education, or infrastructure support. Lastly, the study authors say, distributor organizations' investments in infrastructure development should reflect the scale of operations, financial capacity, proximity to consumers, and capacity to gain value in the supply chain. Overall, this study's findings provide important lessons in how to effectively promote efficient distribution in local food value chains.

Diamond, A., Barham, J., & Tropp, D. (2009). *Emerging market opportunities for small-scale producers: Proceedings of a special session at the 2008 USDA Partners Meeting*. Washington, DC: Agricultural Marketing Service, U.S. Department of Agriculture.

This report summarizes a panel discussion entitled, "Emerging Market Opportunities for Small-Scale Producers," held as part of the USDA's Fifth Annual Partners Meeting in August 2008. The authors argue that emerging growth in alternative marketing channels is increasing opportunities for small farmers to market products with qualities or characteristics of production that are not generally available to mainstream suppliers. This market opportunity represents a potential for small farmers to earn greater incomes. The specialty qualities that may increase marketability include "heirloom" varieties of produce (many of which have diminishing quality when transported long distances), locally grown or raised food products of all types, sustainable farming methods, and organic certification. Selling such specialty products through alternative marketing channels, which include direct-to-consumer and direct-to-business, often enables small farmers to be price makers, rather than price takers. In other words, producers are able to set prices because their products have unique characteristics without ready substitutes, and there's a demand for those products. Additionally, small diversified farmers often have an advantage in these direct-to-consumer market channels because customers want a variety of products in small quantities.

DiGiacomo, G. (2008). *Minnesota grocery store demand for local, organic farm products*. St. Paul, MN: Minnesota Institute for Sustainable Agriculture, University of Minnesota.

DiGiacomo's study explores grocery store demand for locally sourced and organic produce throughout Minnesota. Researchers gathered data in 2007 through phone surveys with 255 buyers from 86 independent and corporate-owned grocery stores. Survey questions focused on sourcing practices, current and expected sales of locally grown and organic produce, and perceptions about direct purchasing from farmers. The report focuses on the results from Southeast Minnesota, where results show that all buyers surveyed had purchased products from Minnesota suppliers in the previous year (2006). Of those buyers, 69 percent had purchased directly from farmers. Independent grocers were shown to have the greatest flexibility to source directly from farmers, although such direct purchases were limited by seasonality. Direct sales between grocers and farmers were most commonly arranged when farmers directly contacted buyers; buyers were much less likely to identify farmers through the Internet, the Minnesota Grown Directory, trade shows, or farmers markets.

Southeast Minnesota buyers said they preferred that farmers contact the store directly to arrange sales and to receive price sheets, labels, copies of organic certification, and point-of-purchase materials, and to set delivery schedules. Common reasons buyers gave for local sourcing were company policy, desire to support the local economy, customer demand, product quality and freshness, as well as transportation and distribution advantages. However, buyers did not cite price as a reason for buying locally. The majority of buyers who did not buy directly from growers in 2006 cited a lack of known locally certified organic producers or said they had not been approached by certified organic farmers to arrange

sales. Overall, sales of organic food products to consumers represented less than 5 percent of total food sales in 2006 in Southeast Minnesota.

Feenstra, G. W., Lewis, C. C., Hinrichs, C. C., Gillespie, G. W., & Hilchey, D. (2003). Entrepreneurial outcomes and enterprise size in US retail farmers markets. *American Journal of Alternative Agriculture*, 18(01), 46-55.

Feenstra et al. explore the relationship between business activities and enterprise size among farmers market vendors in New York, Iowa and California. The study presents findings from a 1999 mail survey of 400 market vendors representing 20 markets in each state. The results reveal that 56 percent of responding vendors are small-scale enterprises. Over half of these enterprises are operated by market gardeners or part-time farmers. These small-scale enterprises were found to sell at markets closer to their farms, rather than medium or large enterprises, and to have less market and business experience. Small-scale farmers were more likely to view farmers markets as their more important business development opportunity, even while medium and large enterprises made more business contacts and engaged in more entrepreneurial activities at farmers markets. Feenstra argues that farmers markets represent one of the few options for small-scale entrepreneurs to maintain or improve their market niche.

Fischer, M., Hamm, M., Pirog, R., Fisk, J., Farbman, J., & Kiraly, S. (2013). *Findings of the 2013 National Food Hub Survey*. East Lansing, MI: Michigan State University Center for Regional Food Systems & The Wallace Center at Winrock International. Retrieved from <http://foodsystems.msu.edu/activities/food-hub-survey>

Fisher et al. present the findings from the 2013 National Food Hub Survey, which collected national data on food hub financial viability, operational activities, characteristics, challenges and opportunities. The Internet-based survey was administered by the Michigan State University Center for Regional Food Systems in partnership with the Wallace Center at the Winrock International non-profit organization. The data show that, on average, food hubs in the United States have a business efficiency ratio of 1.07 and a median efficiency of 1.00 (where a ratio greater than 1.00 means that expenses exceed revenues). The most successful food hubs in terms of financial sustainability were those structured as for-profits or cooperatives, those that have been in operation for more than 10 years, and those that work with a relatively large number of producers. While the findings indicate that grant funding is important for many food hubs, most were found to support their core food aggregation and distribution operations without significant external funding. In addition to aggregating and distributing food, 50 percent of food hubs offer additional services to producers and customers, including product storage, marketing services, and food donation to food banks. However, less than 30 percent operate a demonstration or incubator farm or provide liability insurance to producers, and less than 20 percent offer processing services like canning, cutting or freezing services.

The survey also showed that while some hubs offer product packing services for farmers, 58 percent of food hubs pack most of their products at the farm level, indicating a probable large cost savings for the hubs and an added cost for producers. In terms of supplier characteristics, 67 percent of survey respondents reported that all or most of their producers were small to mid-sized. On average, 60 percent of a food hub's total gross sales came from small and mid-sized producers' food products. Almost all food hubs reported a growing demand for their products and services, but most also reported facing barriers to meeting this demand. Most barriers were operational, including access to capital. Other

common operational challenges reported were managing growth, balancing supply and demand, negotiating prices with producers and consumers, finding appropriate technology for operations, and finding reliable seasonal or part-time staff. The authors indicated a need for further research on the impact of food hubs on local economies. The survey results present a useful snapshot of the national landscape of food hub operations from the perspective of the food hub actors.

Gao, Z., Swisher, M., & Zhao, X. (2012). A new look at farmers markets: Consumer knowledge and loyalty. *Hort Science*, 47(8), 1102-1107.

Gao et al. investigate consumers' perception of produce at three farmers markets in Florida. The study focuses on perception of freshness and local production and how these relate to farmers market loyalty. The researchers solicited the participation of 165 consumers randomly at the three farmers markets with a \$1 incentive; where 124 surveys were complete and usable. Researchers also interviewed a manager or representative at each market. The survey found that the most important reasons consumers shop at farmers markets are preferences for freshness and locality of produce, where 98 percent and 94 percent of respondents respectively rated these as the most important factors in their decision. The availability of organically grown produce and "knowing the farmers" were also rated important by 78 percent and 81 percent of respondents, respectively. The survey finds high social embeddedness of each farmers market, meaning that the market fills a demand for social interactions - including meeting friends or family. In other words, the atmosphere is an important draw to the market.

Consumer loyalty was measured by the percentage of consumers who would continue shopping at a farmers market even if the products did not meet their expectations for recent harvest, definitions of "local, organic," or "vendor-grown." The findings show that most consumers would continue shopping at the markets even if vendor practices did not meet their expectation. Of the product characteristics, learning that the products were not "local" (grown by local farmers) had the greatest negative impact on consumer loyalty - only 53 percent of respondents would continue shopping at a farmers market if products weren't local.

Grace, C. (2010). *New York state farm to school 2009 food service directors survey highlights*. Albany, NY: Urban Food Systems Program, New York State Department of Agriculture and Markets. Retrieved from <http://www.agriculture.ny.gov/f2s/documents/F2SSurveyResults2009final.pdf>

Grace presents results of the 2009 Food Service Directors Survey, which investigates the extent of, interest in, and barriers to New York's farm-to-school activity. The online survey was completed by 251 respondents, representing a 28 percent response rate; respondents consisted of 211 public schools districts, 3 juvenile correctional centers, 11 residential centers, and 26 private schools. About 62 percent of respondents had purchased local food, with most local purchases made through distributors rather than direct from farmers. About 32 percent of respondents expressed interest in purchasing local food products. Regarding motivations for purchasing local foods, the most highly ranked factors were benefits to the local food and farm economy (94 percent), promoting good public relations (82 percent), access to healthier foods for students (72 percent), connecting students to where their food comes from (67 percent), knowing the sources of food products (63 percent), and increasing students' consumption of fresh produce (61 percent).

The most highly ranked concerns among respondents about buying local foods were “too expensive” prices (62 percent), unreliable delivery (38 percent), “too complex” purchasing process (34 percent), inconsistent quality (31 percent), and failure to meet required specifications (16 percent). The most commonly cited barriers to purchasing more fresh produce were an insufficient food budget (55 percent), lack of equipment for preparing fresh foods (37 percent), lack of culinary training to prepare fresh foods (35 percent), insufficient staff for fresh food preparation (33 percent); and lack of sufficient cold storage for fresh food products (27 percent). Respondents named several resource needs to increase purchasing of local foods; in order of priority they are: financial support, a list of local products available through current distributors, a simplified state procedure for buying locally grown produce, and a directory of local farms that serve schools.

Gregoire, M. B., Arendt, S. W., & Strohbehn, C. H. (2005). Iowa producers' perceived benefits and obstacles in marketing to local restaurants and institutional foodservice operations. *Journal of Extension*, 43(1). Retrieved from <http://www.joe.org/joe/2005february/rb1.php>

Gregoire et al. explore local producers' perception of direct-to-institution marketing channels in Iowa. Questionnaires were mailed to 560 Iowa producers listed in producer directories, with 195 responding for a 35 percent response rate. The findings show that local producers sold vegetable items most often, with meat items the least commonly sold items. The most common marketing channels among respondents were direct-to-consumer (82 percent) and farmers markets (74 percent). While 25 percent were currently selling produce to local institutional foodservice operations, 44 percent had never sold to such operations. The most commonly cited reasons producers cited for not marketing to local institutions were their (the producers') lack of capacity to grow or raise sufficient quantities to meet buyers' demands and their inability to secure a desired price.

Similarly, the most commonly cited major obstacles to selling to local foodservice operations included a perceived lack of a dependable market, liability concerns, and the inability to do the following: produce desired products for year-round availability, charge desired prices, comply with food service buyers' ordering procedures, and produce needed quality. With about 25 percent of respondents using an Extension publication to learn about institutional markets, the authors advocate broader communication of issues such as buyer receptiveness, price negotiation, regulations, and buyer-seller relationships.

Gregoire, M., & Strohbehn, C. (2002). Benefits and obstacles to purchasing food from local growers and producers. *The Journal of Child Nutrition & Management*, 26(1). Retrieved from <http://docs.schoolnutrition.org/newsroom/jcnm/02spring/gregoire/>

Gregoire and Strohbehn identify benefits and obstacles to schools directly purchasing local food in four Midwestern states. A survey was distributed to 1,244 schools in Minnesota, Iowa, Nebraska, and Kansas, with 237 responding for a 19 percent response rate. Approximately one third of respondents said they had purchased food products from local growers or producers. The most highly ranked benefits to purchasing local food were receipt of good public relations and the ability to support the local economy. Other high-ranking benefits cited by schools included the ability to buy fresh foods in smaller quantities, knowledge of the product sources, and food safety. The highest ranking obstacles to buying local foods were the lack of year-round availability of produce and the inability to obtain the quantity required. The low response rate limits the ability to generalize the findings.

Gunter, A., & Thilmany, D. (2012). Economic implications of farm to school for a rural Colorado community. *Rural Connections*, 6(2), 13-16.

Gunter and Thilmany examine the potential economic impact of increasing the quantity of locally sourced food in a Colorado school district's food supply. The analysis relies on marketing data for purchases and uses a customized IMPLAN model to predict the impact of the direct and indirect linkages of the outcomes. The study estimates the impact for several scenarios, which include local versus regional scope and gross versus net impact. The gross impact assumes that within the area, the shift to local food produces no new demand, as the food had previously been sourced from outside of the region and therefore any losses are external to the area. The authors argue that the most realistic scenario is a net regional impact that incorporates a customized model for the farm-to-school sector. Under this scenario, the purchase of \$39,125 in local produce in a six-county region is estimated to generate almost \$8,000 net impact in terms of output. Most of this impact is derived from induced effects (with zero from direct effects). In all scenarios, the induced effects are associated with greater output values than the indirect effects.

Happy Dancing Turtle. (2012). *Central Minnesota food hub feasibility study*. Retrieved from http://ngfn.org/resources/ngfn-database/knowledge/Central_Minnesota_Food_Hub_Feasibility_Study.pdf

This study sponsored by the Happy Dancing Turtle non-profit organization discusses the feasibility of establishing a regional food hub in Central Minnesota. The analysis, which explores several economic scenarios, relies on data gathered through a literature review and surveys of regional producers and consumers, as well as secondary regional market data. Many findings of the study are quite useful. For example, in one 2011 survey, 70 percent of producers expressed an interest in selling to a local food hub. Regarding factors that would increase a producer's willingness to sell to a food hub, the most commonly cited were the ability of the food hub to pick-up produce from the farms (57 percent), and the availability of facilities for processing and adding value to foods (43 percent). Using regional data, the analysis estimates that the unmet seasonal demand for fresh produce in the Brainerd (MN) "micropolitan" area, where the food hub would be located, is between \$3.8 and \$11.6 million. Conservative estimates of total fresh produce that could be sold through the food hub in 2013 were projected to generate \$850,000 in sales. The analysis also shows that at capacity, the food hub could create between 45 and 145 additional jobs. Even if only 25 percent of the available supply revealed in surveys was captured by the food hub, the analysis predicts the economic impact would still result in \$1.1-\$3.2 million in local food sales, the creation of 20-70 jobs (on top of direct employment), and a regional multiplier effect of another \$2.86-\$8.3 million. The authors interpret the results of the analysis as strong evidence of the feasibility of developing a food hub in Central Minnesota, with benefits in improving market gaps, allowing producers to diversify their crop base, and creating economic growth.

Hardesty, S. D. (2008). The growing role of local food markets. *American Journal of Agricultural Economics*, 90(5), 1289-1295.

Hardesty evaluates the potential of institutions as a market for locally grown produce. More specifically, the study uses interview data from 99 food service managers at colleges, universities and teaching hospitals to examine the effects of transaction costs, price, and institutional characteristics on local produce purchases. The impacts are measured using an ordered logit analysis. (For basic information on ordered logit models, see this Wikipedia page: http://en.wikipedia.org/wiki/Ordered_logit.)

The model reveals a general trend that institutions are more likely to buy locally grown produce if they are willing to bear the higher cost of transaction costs. For example, institutions that require vendor approvals are 25.5 times more likely to maintain a local buying program than those that don't, all else constant. In other words, institutions that are willing to bear negotiation costs of the vendor approval process are more likely to maintain local produce purchasing programs. Similarly there is a positive relationship between the number of suppliers — where each additional supplier is associated with increasing monitoring costs — and the odds of maintaining a local produce purchasing program.

Overall, the findings show that institutions bear significant transaction costs and price premiums through their local purchasing programs, and because of attitudinal differences in environmental and social values, institutions that maintain local food programs are less likely to consider stable product prices and year-round availability as important factors in their purchasing decisions. Institutions without local food-buying programs were more likely to rank lower price as an important consideration in purchasing decisions.

Hendrickson, M., Johnson, T., Cantrell, R., Petersen, K., Scott, J., & Lucht, J. (2013). *Explaining linkages among farmers and consumers in local and regional food systems to enhance rural development*. Columbia, MO: Local Food Linkages Project; University of Missouri Extension, University of Nebraska Institute of Agriculture and Natural Resources. Retrieved from <http://aese.psu.edu/nercrd/economic-development/materials/presentations-from-2013-afri-meeting/explaining-linkages-among-farmers-and-consumers-in-local-and-regional-food-systems-to-enhance-rural-development>

Hendrickson et al. present initial findings from a producer survey conducted in Nebraska and Missouri. Farmers were identified through Internet databases, local outreach through extension educators, farmers market managers, and outreach through a farmer and sustainable agriculture listserv. A total of 122 mail surveys were completed, representing a 44 percent response rate. About 80 percent of respondents reported that they sell produce through at least one type of direct-to-consumer market. A total of 42 percent of respondents sell direct-to-institution, either wholesale or retail. And about 40 percent sell through both direct and intermediated channels. The most common type of products sold in these markets includes vegetables (70 percent of respondents), fruit (41 percent), eggs (27 percent), and meat (22 percent). The survey did not collect data on farm size or scale of production.

Commonly cited motivations for producing food for local markets include: an additional level of pride in their products (91.3 percent); an added level of satisfaction (88.7 percent); the ability to contribute to quality of life in their community (78.6 percent); earning additional income (79 percent); and holding an added level of independence (79.1 percent). The most common types of challenges that producers face relate to concerns around scaling up, regulation and certification, as well as marketing challenges. Regarding marketing challenges, nearly 40 percent indicated an inability to provide produce in high enough volumes to meet demand.

Henneberry, S., Whitacre, B., & Agustini, H. (2009). An evaluation of the economic impacts of Oklahoma farmers markets. *Journal of Food Distribution Research*, 40(3), 64-78.

Henneberry et al. use survey data and IMPLAN software to generate estimates of the income, employment, and output created by farmers markets in Oklahoma. Specifically, the researchers use IMPLAN to produce sector-specific multipliers for farmers market activity,

and they use data from written surveys of market managers, customers, and vendors to both assess customer spending in other sectors and to estimate the total number of jobs and income created by farmers markets. The study estimates that the 21 farmers markets under study in 2002 saw gross sales of \$3.3 million. They then calculate the economic multipliers to measure the total change throughout the economy resulting from changes in farmers market sales. The analysis shows that the Type III multiplier (which accounts for direct, indirect, and induced impacts, plus differential spending patterns among different income groups) for farmers market gross sales is 1.78.

When the multiplier is applied to the gross sales, the total economic impact of market sales on Oklahoma's economy are shown to be \$5.9 million. The model also estimates that the total sales generated more than \$2.2 million in personal income and 113 full-time equivalent jobs. Regarding the impact on sales and personal income, the direct effect was the most significant factor, followed by the induced effect; the indirect effect showed the least impact. The impact on employment differed where the indirect effect was found to be stronger than the induced effect.

Hughes, D. W., Brown, C., Miller, S., & McConnell, T. (2008). Evaluating the economic impact of farmers markets using an opportunity cost framework. *Journal of Agricultural and Applied Economics*, 40(1), 253.

Hughes et al. employ an IMPLAN-based input-output model to estimate the impact of farmers market activity on the regional economy in West Virginia. This study takes the analysis further by accounting for lost revenue in grocery outlets stemming from farmers market spending. From producer survey data, the study authors estimate the annual direct sales from 34 farmers markets at \$1.725 million. The analysis shows that such sales have a gross impact of \$2.389 million in output, which includes \$1.48 million in gross state product and 69 full-time equivalent jobs. They estimate that the impact of shifting consumer spending to farmers markets (the opportunity cost) is \$1.316 million, which includes \$0.827 million in gross state product and an impact on employment of 26.4 full time equivalent jobs. As such, the total net impact of farmers markets, which is derived from the difference between farmers market impact and the opportunity cost impacts, are still positive but greatly reduced relative to measures that ignore opportunity costs. The total net impact is calculated at \$1.075 for industry output, \$0.653 for gross state product, and employment of 42.8 full time equivalents.

Hultberg, A. (2011). *Breaking the bottleneck: Models for local food distribution in Minnesota* (Unpublished master's thesis). Minneapolis, MN: University of Minnesota.

In this 2011 masters' thesis, Hultberg presents findings from primary research on local food production and distribution in Minnesota. The analysis relies on mail surveys of fruit and vegetable farmers in the state, for which 258 responses were collected representing a response rate of 32 percent. Hultberg also conducted semi-structured interviews with food service directors who purchase local foods and with distributors that purchase food directly from farmers. The farmer survey reveals that the majority of respondents (62 percent) farm less than 9 acres; about 32 percent farm between 10 and 99 acres; and about 7 percent farm more than 100 acres. The most common marketing channels for respondents' fruit and vegetable sales were farmers markets (68 percent), followed by on-site sales (58 percent), other consumer direct sales (13 percent), restaurants (10 percent), and supermarkets (10 percent). Farmers who sell to farmers markets, onsite or CSAs sell the majority of their

produce through these channels, while farmers who sell directly to institutions sell a relatively smaller proportion of their total produce to this market.

The most common motivations for marketing channels include: enjoying the relationship with customers (78 percent of respondents), allowing for production at desired scale (63 percent), allowing for production of desired products (61 percent), offering the highest profits (58 percent), and short travel requirements (48 percent). Respondents indicated a mild-to-moderate interest in pursuing alternative distribution networks and farm-to-school programs over the next five years. For instance, 51 percent are interested or very interested in participating in farm-to-school programs. Regarding desires for future production, most farmers said they plan to increase production (66 percent), 25 percent plan to maintain current production levels, and 8 percent have plans to decrease production over the next five years. About 40 percent of respondents reported annual gross sales of fewer than \$10,000 from their farming activities.

Hunt, A. R. (2007). Consumer interactions and influences on farmers market vendors. *Renewable Agriculture and Food Systems*, 22(01), 54-66.

Hunt presents survey findings on the preferences, motivations, and demographic characteristics of farmers market consumers and vendors in Maine. A total of 216 consumers volunteered to participate in the survey at eight separate market locations. Hunt also surveyed 81 market vendors (all but one of the current vendors at the eight market locations), including 65 farmers and 16 artisans or bakers. Regarding consumer characteristics, the findings show that the average respondent had higher income and post-secondary educational levels than the average Maine population, and was more likely to be female. Consumers identified produce freshness as the most important reason for shopping at a farmers market (when given eight possible choices). The next most important reasons were quality, availability of specialty products, supporting local farmers, and having contact with the farmer. The least important was price.

Consumers also value the social factors of farmers market shopping, with 98 percent reporting “having fun” at the market, 59 percent reporting making the trip a family event, and 82 percent reporting a desire to visit the farm from which they purchase food. Through a regression analysis, Hunt also found that consumer spending at the farmers market is influenced both by economic and social factors. Specifically, “having fun” at the market, making a trip to the market a family event, and talking with vendors about seasonal products each has a greater marginal effect on spending than income alone. Lastly, a number of farmers (41 percent) said that they had changed their products according to consumer demand, indicating the influence of direct customer feedback. Hunt’s study demonstrates the importance of social interactions in farmers markets and their influence on both consumer spending and farmers’ production practices.

Intervale Center – Agricultural Development Services. (2008). *Vermont farm producer survey preliminary report*. Retrieved from <http://www.intervale.org/wp-content/uploads/IC-Producer-Survey-Preliminary-Report.pdf>

This report presents findings from the 2007 Vermont Food Producer Survey. The survey sample was selected from farmer directories and restricted to food-producing farmers within five counties surrounding Chittenden County. A mail survey generated 97 usable surveys, representing a response rate of 32.4 percent. The findings show that the average farm size of respondents was 169 acres, with the greatest proportion (about 30 percent)

operating farms between 5-49 acres. About 57 percent of the respondents earn \$49,000 or less from farm income. Most farms produced vegetables and herbs (57 percent), or other produce (47 percent). In terms of marketing strategies, over 40 percent of respondents sold exclusively through direct-to-consumer channels, which includes farmers markets, pick-your-own operations, and other on farm retail sites. Another 20 percent of respondents sold exclusively through direct retail channels, including direct sales to grocers, cooperatives, and other food retailers. About 11 percent of farms primarily marketed through CSAs.

The most commonly cited benefits to selected markets were: having access to customers, convenience, better prices, and better sales volumes. Having access to consumers was most often cited among respondents selling their products through farmers markets, CSAs, and farm retail. Better prices were associated with both direct and non-direct sales, while higher sales volume was most often associated with retail stores or wholesale outlets. The most common challenges to selling foods in certain markets were labor and resource requirements, competition, and lack of access to customers. Generally labor challenges were associated with direct-to-consumer and direct-to-retail markets, while competition challenges were associated with wholesale and retail outlets. Respondents cited access to customers as a challenge in selling to direct sale outlets only, indicating that this issue can be both a benefit and challenge to direct marketing. Regarding the potential for expansion, over 70 percent of respondents said they had the ability to expand production in the face of new market opportunities, while 11 percent did not have the capacity, and 18 percent were unsure. The most common barriers for production expansion were labor, land, marketing capacity, and storage.

Joannides, J. (2012). *Local food systems as regional economic drivers in Southern Minnesota*. Prepared for Southern Minnesota Initiative Foundation and the McKnight Foundation. Minneapolis, MN: Minnesota Institute for Sustainable Agriculture, University of Minnesota. Retrieved from <http://www.mcknight.org/system/asset/document/120/pdf-2-4-mb.pdf>

Joannides explores the economic aspects of local food systems with a focus on 20 counties in Southern Minnesota. The study presents primary data collected through interviews with regional food and farm entrepreneurs, as well as economic development professionals. The interview data offer perspectives on market environments, production and distribution issues, and consumer demographics. The interviews with farmers and food businesses reveal perceived growth in demand for local foods in the past five years and an anticipation of continued growth. Generally, interviewees reported that existing demand already surpasses the supply generated through current production capacity. The report also presents estimates of the scale of various direct markets for local food in Minnesota, noting significant growth in certain markets. For example, the study says, there are 150 farmers markets in Minnesota as of 2011 - up from 81 in 2008. The study also cites over 85 CSAs in the state, up from 2 in 1986 (part of 4,000 in the nation); and the study says 123 districts in the state participated in farm-to-school food sourcing in 2011 - against a backdrop of 2,305 districts representing 9,807 schools in the nation.

Karnitz, N., Mao, J., Mathers, D., Patnode, S., & Xu, X. (2013). *Rural Minnesota food systems and food hub overview*. Prepared for the Regional Sustainable Development Partnerships, University of Minnesota Extension, by the Carlson Ventures Enterprise. Retrieved from <http://blog.lib.umn.edu/rsdp/southeast/docs/RSDP-SE-Rural-MN-Food-Hub-Review.pdf>

This report presents findings on the state of the local food system in rural Minnesota as of 2013, and study authors assess the feasibility of a food hub model for supporting the

development of these systems. The authors first conducted interviews with Minnesota growers (CSAs, farmers markets) and buyers (food aggregators, grocery co-ops, and institutional buyers) to investigate local food production and distribution. The authors also performed secondary market research in order to assess existing food distribution systems throughout the United States that are relevant to Minnesota.

The data analysis revealed several primary trends. First, the authors found that most aggregation in rural Minnesota occurs in informal networks, e.g., relationships between neighbors and sharing equipment to meet demand capacity. Next, while there is increasing institutional demand for local food, the analysis found little interest among producers to fill the supply gap. The authors note that farmers prefer to direct their supply to more cost-effective channels (farmers markets, CSAs, etc.) which allow for the production of diversified crops. Farmers also said they prefer not to expand production, since many are hobby farmers. Regarding the feasibility of a food hub model given these trends, the analysis reveals several opportunities for such an approach. These opportunities include tapping into the following: an increasing awareness of the benefits of local foods, which is driving up demands from institutional buyers; the success of online co-ops and food aggregators; and the increasing recognition among producers of the benefits of resource sharing and partnerships. The analysis also found persistent challenges to implementing the food hub model, including the competitive advantage of large-scale national producers, lack of physical infrastructure, the need for quality standards, seasonality challenges, and budget constraints, among others.

Given these findings, the authors recommend two actions to improve the conditions for successful implementation of local food hubs in rural Minnesota. The first is to stabilize demand to incentivize appropriate supply, which can be done by forecasting demand from an institutional level down to a producer level. The second is to establish strategic partnerships to promote education and awareness among consumers, producers, and policy makers alike about the value of food hubs to a local food system. Although these recommendations are tailored to the Regional Sustainable Development Partnerships at University of Minnesota Extension, the findings provide a valuable assessment of the local food systems in the state and the work needed to improve the feasibility of a food hub model.

King, R. P., Hand, M. S., DiGiacomo, G., Clancy, K., Gómez, M. I., Hardesty, S. D., & McLaughlin, E. W. (2011). *Comparing the structure, size and performance of local and mainstream food supply chains* (Economic Research Report ERR-99). Washington, DC: Economic Research Service, U.S. Department of Agriculture.

King et al. use case studies of specific supply chains to compare three food market segments — mainstream, direct, and intermediated — in five metropolitan areas. The analysis relies on data from interviews and site visits, as well as data from the Census of Agriculture and other publicly available sources. The study finds that local supply chains (direct and intermediated markets) represent a small proportion of the total demand of a given product in a respective area. Despite the small market size, producers receive a greater share of retail prices in direct and intermediated markets relative to mainstream markets. Producers in direct market supply chains retained the highest share of retail dollars in 4 out of the 5 locations — relative to a total of 15 supply chains in 5 locations. In these 5 locations, producer shares ranged from 70 to 80 percent of the retail price. While the costs of bringing a product to market, which usually include processing, distribution, and marketing, account for some additional costs, the producers participating in direct markets were still shown to receive

significant price premiums after subtracting out associated costs. Ultimately, the relative profitability of local marketing depends on a number of factors – including sales volume, price, and cost effectiveness of supply chain functions. What’s more, because small producers operate at low volume, the profit margins rest on a delicate balance of supply and demand that can easily be disrupted. Due to economies of scale, mainstream supply chains are shown to minimize distribution costs and transportation fuel, and there is possibility for this existing infrastructure to incorporate more local products if greater quantities are provided.

LaMendola, K. (2013). *Food producer survey for Allegany, Cattaraugus, and Chautauqua counties: A survey assessment of capacities, opportunities, and challenges for food producers in an emerging local food system*. Salamanca, NY: Southern Tier West Regional Planning & Development Board. Retrieved from <http://www.freshlocalwny.org/pdfs/FoodProducerSurveyReport.pdf>

LaMendola presents findings from a baseline survey of food producers in three New York counties to assess capacities, opportunities, and challenges in meeting a growing demand for local food. The online survey generated a 40.9 percent response rate of non-commodity, small-to-medium market-scale farmers and processors. About 32 percent of respondents reported that food production was the primary source of household income, while most respondents (63.6 percent) reported food production as a secondary source of income. Most respondents said they exclusively farm land they own (75 percent), but an additional 22.5 percent said they grew produce on their own land while also leasing additional acreage for production. Only 2.5 percent of respondents said they farmed leased land exclusively.

The average number of acres owned by respondents was 89.5, with a median of 37 acres. Overall, more than a third of the responders used up to 25 percent of the land they owned and/or leased for production, and almost half used between 25 percent and 75 percent of the land available for production. Accordingly, nearly half of respondents reported that their production was under the full capacity of their land or business. This indicates a significant potential to increase production of local food without incurring significant costs for additional land. About 97 percent of respondents said they sold produce directly to consumers. The three most common direct sales outlets were farmers markets, phone orders, and roadside stands, while the three least common outlets were CSA shares, grower cooperatives, and institutions, such as schools. Respondents identified three major barriers to expanding production: lack of training, business assets, and resources. Many respondents also lacked a marketing plan, farm safety plan, an updated business plan, and GAP 3rdparty-audit certification, which is required for wholesale or institution sales.

Lass, D. A., Lavoie, N., & Fetter, T. R. (2005). *Market power in direct marketing of fresh produce: Community supported agriculture farms* (Working Paper 2005-2). Amherst, MA: PERI Working Papers, 200, University of Massachusetts-Amherst. Retrieved from http://scholarworks.umass.edu/peri_workingpapers/200/

Lass et al. investigate the potential market power of CSA farms in New England, as well as the extent to which these farms exert their market power. The study gathered data on farm and farmer characteristics, revenue from CSA shares, and farm costs of organic CSAs in the northeastern United States through mailed surveys between 1995 and 1997. The authors also used data from U.S. Census on the socio-economic characteristics of the markets served by each CSA to estimate a demand function. With the data, the authors created an econometric structural model (outlining the relationship of demand and supply) to estimate

the extent to which the CSA farms exert monopoly power –the ability to raise the market price of a good higher than the marginal cost. The model shows that the CSAs exert an estimated market power parameter of 0.02, meaning that they exert about 2 percent of their potential monopoly power. This finding indicates that the CSA farms are able to set share prices that cover costs of production and provide fair wages; yet, even though the farms have power to set prices above marginal costs, they elect to exert very little of this power in choosing prices. These findings, according to the authors, show that the CSA model can increase the profitability of family farms and provide benefits to the community with minimal exertion of market power.

LeRoux, M. N., Schmit, T. M., Roth, M., & Streeter, D. H. (2010). Evaluating marketing channel options for small-scale fruit and vegetable producers. *Renewable Agriculture and Food Systems*, 25(1), 16.

LeRoux et al. compare the costs and benefits of different marketing channels for locally produced fruit and vegetables in Central New York. The analysis uses a case study methodology to examine four successful small-scale fruit and vegetable farmers engaged in a variety of wholesale and direct marketing channels. The researchers collected data on the amount of labor devoted to specific marketing activities, distance traveled, labor rates, and gross sales. Study authors also analyzed the performance of each market channel with respect to sales volume, profit, labor requirements, and risk. The analysis found that the CSA direct marketing channel has the highest profitability percentage for farmers, followed closely by unstaffed farm stands. Wholesale markets reported the highest sales volume and offered the lowest price, with CSA channels next highest in sales volume.

Regarding labor requirements, the survey found that farmers market and staffed u-pick operations required higher-than-average labor hours to achieve the same levels of sales. CSAs, unstaffed u-pick, and wholesale distribution channels required less labor hours per sale levels. Overall, the analysis found the CSA channel to be best performing option with respect to volume, unit profits, labor requirements, and risk preferences. Farms participating in the study also showed a preference to supplement CSA marketing with wholesale outlets, demonstrating that flexibility in combining different channels enables sales optimization – given the perishable nature of the crops and unpredictable harvest quantity.

Lev, L., Brewer, L., & Stephenson, G. (2003). *Research brief: How do farmers markets affect neighboring businesses?* (Oregon Small Farms Technical Report No. 16) Corvallis, OR: Oregon State University Extension. Retrieved from <http://smallfarms.oregonstate.edu/sites/default/files/publications/techreports/TechReport16.pdf>

This study investigates spillover effects of farmers markets in encouraging spending at other local businesses in Oregon and Idaho. Lev et al. (2003) examine the additional sales at neighboring businesses encouraged by farmers markets from 1998 to 2003. The results of this survey analysis show that 24 to 88 percent of farmers market shoppers were drawn to a downtown area primarily to visit the market, depending on the city and the time. Further, between 33 and 65 percent of farmers market shoppers, depending on the city, shopped at neighboring businesses during their visit to a farmers market. Finally, the analysis estimates the total amount spent by farmers market visitors at neighboring businesses ranges from \$4,400 to \$38,400 per market day, depending on the city and year. While these results cannot be generalized, they indicate a positive benefit of farmers markets to neighboring businesses.

Low, S. A., & Vogel, S. J. (2011a). *Direct and intermediated marketing of local foods in the United States* (Economic Research Report 128). Washington, DC: Economic Research Service, U.S. Department of Agriculture.

Low and Vogel examine the relative scales of local food market channels —including direct-to-consumer and intermediated food sales — according to farm size, commodity specialization, and characteristics of farm operators. The analysis relies on nationally representative data collected from the 2008 Agricultural Resource Management Survey (ARMS). In the analysis, Low and Vogel show that gross sales of locally marketed food accounted for 1.9 percent of total gross farm sales in the country as of 2008. Of the food sold locally, 50-66 percent was marketed through intermediated, rather than direct-to-consumer, channels. Regarding variations in market channels by farm size, the study shows that small local food farms (those with gross farm sales below \$50,000) represented 81 percent of all local food farms, accounting for just 11 percent of total local sales. These farms were also more likely to engage in direct-to-consumer marketing channels than intermediated market channels.

The study showed that medium-sized farms (those with gross farm sales between \$50,000 and \$249,000) represented 14 percent of all farms supplying local foods (local food farms), and 19 percent of total local sales. Medium-sized farms were also shown to rely on direct-to-consumer channels or a combination of direct-to-consumer and intermediated marketing channels at equal rates, but were much less likely to exclusively use intermediated markets. Large farms (with gross sales of \$250,000 or higher) represent about 5 percent of all local food farms and account for 70 percent of total local sales, with most of these local sales occurring through intermediated market channels. The findings reveal a positive relationship between farm size and use of intermediated market channels: As the size of a farm increases, the frequency of intermediated market uses increases (assuming that the farm is already engaged in local sales).

The average value of local food sales in 2008 ranged from \$7,800 for small farms to \$70,000 for medium sized farms and \$770,000 for large farms. Lastly, factors including growing conditions that favor fruit and vegetable production, proximity to farmers markets, and transportation access were shown to increase likelihood of direct-to-consumer sales. As such, the Northeast, West Coast, and certain metropolitan areas in the US are shown to have the highest direct-to-consumer food.

Low, S. A., & Vogel, S. J. (2011b). *Local foods marketing channels encompass a wide range of producers*. *Amber Waves*. Retrieved from <http://econpapers.repec.org/article/agsuersaw/120794.htm>

Low and Vogel present key findings from the USDA Agricultural Resource Management Survey of 2008. The analysis shows that in 2008 local food sales in the country amounted to \$4.8 billion, which includes direct-to-consumer sales and intermediated sales. More than half of these local food sales (about \$2.7 billion) were generated by the 13,400 farms that sold exclusively through intermediated channels. About 22,600 farms were found to use a combination of direct-to-consumer and intermediated marketing channels, generating over a quarter of the local food sales (\$1.2 billion). The analysis also shows that about 71,200 farms engaged exclusively in direct-to-consumer marketing channels, including farmers markets, roadside stands, CSAs, and more. These marketing channels generated about \$877 million in sales in 2008. Accordingly, while direct marketing channels comprise the most common outlet for farms that sell local food, this market channel generates a disproportionately

small volume of sales relative to the fewer farms that sell through intermediated channels or a combination of both channel types.

MacDonald, J., Korb, P., & Hoppe, R. (2013). *Farm size and organization of U.S. crop farming* (Economic Research Report No. 152). Washington, DC: Economic Research Service, U.S. Department of Agriculture. Retrieved from <http://www.ers.usda.gov/publications/err-economic-research-report/err152/>

MacDonald et al. explore trends in size and structure in domestic crop farming over recent decades. The study relies on primary data sources from the Census of Agriculture and the Agricultural Resource Management Survey. With a growing number of very small farms and very large farms, but a declining number of mid-sized farms, the average size of crop farms has remained relatively static in recent decades. However, the average measure obscures substantial changes in farm structure during this time. The authors instead discuss changes in farm size in terms of a midpoint acreage, a measurement that is relative to quantity of cropland acres rather than quantity of farms. The analysis finds that between 1982 and 2007, the midpoint acreage for cropland increased from 589 to 1,105 (meaning that half of all cropland acres are on farms with more than 1,105 acres, and half are on farms with less).

For the major field crops the midpoint acreage increased more than twofold during this period. For fruit and vegetables, the average increase in acreage was 107 percent, with 35 of 39 of such crops experiencing acreage growth. Regarding local food production, farms that sell to local markets accounted for less than 5 percent of the total cropland. On average, these farms were substantially smaller than other farms. The midpoint acreage for crop farms that sell to local markets was 310 acres in 2010 (relative to 1,105 for other farms). For fruit and vegetable farms selling to local markets, the midpoint acreage was 168 acres, relative to 675 acres for other fruit and vegetable producers. Regarding the general financial performance of crop farms, the average rates of return on equity increases with farm size for the main commodity categories (vegetables, fruit, corn, soybean, and wheat). Despite the shift towards larger farms, 96 percent of U.S. crop farms were still operated as family farms in 2011. These family farms accounted for 87 percent of the total crop production value. The shifting trends in farm size have occurred alongside increasing specialization in production, increasing use of technology and labor saving innovations.

Martinez, S., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., & Newman, C. (2010). *Local food systems: Concepts, impacts, and issues* (Economic Research Report No. 97). Washington, DC: Economic Research Service, U.S. Department of Agriculture. Retrieved from http://www.ers.usda.gov/media/122868/err97_1.pdf

Martinez et al. present a synthesis of literature on growth in local food systems as of 2010. The paper includes figures on the relationship between farm size and marketing channels, using data from the National Agricultural Statistics Service and the 2007 Census of Agriculture. The analysis reveals that 6.2 percent of the nation's farms sold to direct markets in 2007. Small farms (annual sales of under \$50,000) were found to represent the largest group engaged in direct sales. In 2007, there were 116,000 small farms reporting direct sales, while 17,900 medium-size farms (\$50,000 to \$499,999) reported direct sales, and 2,900 large farms (\$500,000 or more). The proportion of farms within each sales class that sell in direct markets was 6.1 percent of small farms, 7.3 percent of medium farms, and 3.1 percent of large farms. The average farm sales from direct sales in 2007 was greatly stratified by farm size, where sales for small farms were \$3,206, for medium farms \$26,016, and \$127,113 for large farms. While large farms earned larger direct sales per farm than

small farms, direct sales accounted for decreasing contributions to their total farm sales. For small farms selling direct, those direct sales accounted for more than 35 percent of total sales, while the figures for medium and large farms were 17 percent and 7.5 percent, respectively.

Regarding difference by type of farm products, vegetable and melon farms were found to have the highest rates of direct sales (44.1 percent). A total of 17.5 percent of fruit and nut farms, and 6.9 percent of livestock and livestock-product farms, sold directly to consumers. While producers of livestock and livestock products, as well as other crops, accounted for almost 75 percent all direct-sales farms, these farms earned only about 40 percent of the total direct sales. Fruit and nut farms engaged in direct sales showed the highest per farm direct sales (\$20,000), followed by vegetable and melon farms (\$18,611). Livestock and livestock-product farms showed the lowest per farm direct sales at \$4,754. Metropolitan counties reported a larger number of farms with direct sales, followed by counties adjacent to metropolitan areas. Remote rural counties showed the fewest farms reporting direct sales.

Matson, J., & Thayer, J. (2013). The role of food hubs in food supply chains. *Journal of Agriculture, Food Systems, and Community Development*, 3(4), 43-47. Retrieved from http://www.agdevjournal.com/attachments/article/354/JAFSCD_Role_of_Food_Hubs_Commentary_July-2013.pdf

Matson and Thayer present commentary on the state of research on food hubs and their role in local food systems as of 2013. Citing USDA reports, the authors document recent growth in local food marketing. They note that food hubs have emerged as a vehicle to facilitate more efficient local food supply chains, and have gained increasing national attention. However, they also note that there is little research on the growth, size, and sales volumes of food hubs or their relative impact on food systems. The study then presents a number of questions on food hubs that future research needs to address, for themes of viability, scale, food safety, community vitalization, and market signals.

Matts, C., & Colasanti, K. (2013). *Local food interest by institutions in Southeast Michigan: A report for Eastern Market Corporation*. East Lansing, MI: MSU Center Regional Food Systems, Michigan State University. Retrieved from <http://foodsystems.msu.edu/resources/fti-report-se-mi>

This report presents results from a survey on institutional interest in local food purchasing in southeastern Michigan. A total of 98 electronic surveys were completed, with 80 responses from institutions with food service programs without outside food vendors. The institutions included six hospitals, 23 individual schools, 42 school districts, and nine “other” institutions (mostly residential child care institutions). Almost 70 percent of the individual schools, school districts and other institutions always or frequently use heat-and-serve foods, and almost 55 percent always or frequently use semi-prepared foods. The hospitals, on the other hand, were more likely to engage in cooking from scratch, in addition to providing semi-prepared and heat-and-serve food. About 41 percent of all institutional respondents had received requests from customers to offer local food, while 77 percent had purchased local food in the last year. Of those institutions that had purchased local foods, about 83 percent had made purchases through a distributor, and 40 percent purchased directly from a farmer or farmer cooperative.

Of the 18 institutions that had not purchased local food in the last year, 66 percent expressed interest in doing so. The most common motivation for the purchase of local foods

was to support the local economy and community. The other primary motivations included access to fresher food, the ability to purchase small or variable quantities, access to higher quality foods, and (competitive) price. The primary barriers cited by institutions to sourcing local food included the lack of products available during certain times of year, lack of budget, and liability and food safety concerns. The most common logistical challenge named was the lack of a distribution avenue to get local foods into the food service program. Other logistical barriers included lack of the following: labor (workforce) to prepare food, facilities to handle local food, and storage. This baseline information provides valuable insights on institutional preferences to help coordinate food sourcing and distribution for farm-to-institution programs.

McDermott, M. (Ed.).(2003). *The Oklahoma farm to school report -including the Oklahoma institutional food service survey*. Poteau, OK: Oklahoma Food Policy Council and the Kerr Center for Sustainable Agriculture.

McDermott's report presents results from the 2002 Oklahoma Institutional Food Service Survey. The survey gathered information from 638 institutions on their practices and preferences for purchasing locally produced foods. The institutions included public school systems, colleges, universities, correctional centers, and state hospitals. The findings, drawn from an overall response rate of 66.8 percent, show that the majority of institutions would be willing to purchase local foods if supported by institutional policies. About 75 percent of respondents had not made local food purchases in the last year, with the most commonly cited concerns related to quality and cost. More than two thirds of respondents would make local purchases if price and quality were competitive and local sources were available. More than half of the respondents would consider local purchases if they could purchase in small quantities.

Overall, the most important factors and concerns influencing decisions about local food purchases were competitive prices, availability of local sources with consistent quality when needed, food safety, order size, processing and preparation, payment arrangements, and categories of desired food. The surveys also found that schools tend to have a greater preference for canned fruit and vegetables than other institutions, which prefer fresh produce. The findings indicate that although local food purchases are not widespread among Oklahoma's public institutions, there is interest and therefore a potential market for locally produced and processed foods among this consumer group.

Meter, K., & Rosales, J. (2001). *Finding food in farm country: The economics of food & farming in Southeast Minnesota*. Lanesboro, MN: Hiawatha's Pantry Project, Community Design Center.
Retrieved from <http://www.crcworks.org/ff.pdf>

Meter and Rosales quantified economic inputs and returns of agricultural production in seven counties in Southeast Minnesota as of 1997. The analysis uses data primarily from the federal Agricultural Census and the Bureau of Economic Analysis from 1997. The calculations show that in 1997, more than 8,400 farms in the region sold about \$866 million worth of farm products. According to the report, farmers spent \$947 million to produce these goods - meaning they spent about \$80 million more than they earned. Further, study authors estimate that around \$400 million of annual input and credit spending was directed to distant suppliers. They also found that most of the \$500 million in food purchases by local residents was for food sourced from outside the region. Meter and Rosales estimate that up to \$800 million left the agricultural region annually around the time of the analysis. Based on case studies of local food initiatives, Meter and Rosales argue that expanding local

food production is an important part of the solution to keeping agricultural dollars in the region – thereby strengthening the local economy.

Minnesota School Nutrition Association and Institute for Agriculture and Trade Policy. (2010). *Farm to school in Minnesota: A survey of school foodservice leaders*. Minneapolis, MN: MSNA and IATP.

This report presents the findings from a 2009 survey on interest and activity in farm-to-school programs among Minnesota foodservice professionals. The survey was completed by food service directors and managers from 82 public school districts, representing a response rate of 84 percent. Respondents from 69 school districts reported purchasing Minnesota-grown foods in 2009. The previous year this figure was at about 30 districts. Of the districts engaged in farm-to-school programs at the time of the survey, 76 percent predicted they would expand their farm-to-school programs in the 2010-11 school year, while no respondents indicated they would reduce participation.

Some 44 percent of respondents had purchased Minnesota-grown foods directly from a farmer or farm co-op in the last year, and 74 percent had purchased such foods through a prime vendor or produce distributor. A majority of respondents reported a “very strong” preference for ready-to use-products (52.6 percent), while 12 percent reported a preference for the ability to work with ready-to-use products only. The remaining respondents reported some comfort with working with uncut produce on occasion (26.9 percent) or being very comfortable handling uncut product (7.7 percent). The most commonly cited barriers to using more local foods were the extra labor and prep time required, pricing and fitting local food into budgets, and the difficulty of finding farmers to purchase from directly.

Minnesota Statewide Health Improvement Program (SHIP). (2013). *Draft: Growers survey report 5*. St. Paul, MN: SHIP.

This 2013 draft report presents findings from a 2012 survey of producers and growers in west-central Minnesota and east-central North Dakota – a survey organized by the Minnesota Statewide Health Improvement Program (SHIP). The mail survey was completed and returned by 35 individuals, representing a response rate of 42 percent. The findings reveal that the majority of respondents (67.8 percent) farmed on parcels of 25 acres or less, while about 25 percent farmed more than 100 acres. The majority of respondents (72 percent) reported annual gross farm sales below \$50,000 in 2012, and almost 85 percent showed a positive net profit that year. Most respondents (57 percent) were found to sell produce directly to consumers on their farm sites; almost half sold to farmers markets; and over 20 percent sold through community-supported agriculture. Sales to stores were less common, with only about 22 percent selling to natural food stores, and about 17 percent selling to schools or restaurants. Wholesale marketing was even less common, with less than 6 percent selling to grower cooperatives or processors, and less than 3 percent selling to distributors, wholesalers, or brokers.

The most highly ranked considerations motivating decisions on market outlets were the reliability of the customers (mean=4.29 on a scale from 1 to 5, where 5 represents “very important”), increasing access to healthy, locally grown food (mean=4.26), the ability to raise products of their choosing (mean=4.15), and building relationships with the community (mean=4.09). The highest ranked operational issues for level of difficulty were production challenges (mean=3.32), fuel costs (mean=3.09), finding customers (2.79), and marketing (mean=2.76).

Regarding interest in supplying schools or other institutions, over 30 percent of respondents expressed interest in growing and selling perishable vegetables, and nearly 29 percent reported interest in selling vegetables for storage to these outlets. As for future production in general, 60 percent of respondents indicated a desire to expand production in the next five years; almost 35 percent indicated a desire to maintain current production levels; and nearly 6 percent said they wanted to decrease production levels. Most respondents believed two strategies would help their farm the most over the next five years: offering more consumer education about local foods (68 percent) and setting higher prices for produce (54 percent). The survey reveals important information on the types of market venues prioritized by respondents and motivations for prioritizing those markets, as well as desires for future production.

National Agricultural Statistics Service. (2009). *Iowa farmers market vendor survey*. Des Moines, IA: National Agricultural Statistics Service, Iowa Field Office, U.S. Department of Agriculture.

The National Agricultural Statistics Service (NASS) present initial findings from a 2009 survey of farmers market vendors in Iowa. The findings show that the average vendor planned to participate in two different markets during the season. Nearly 48 percent of vendors reported that they plan to sell at any market 25 days or more during the year. The largest portion of vendor sales were generated through fruit and vegetable sales (45 percent), followed by baked goods (21 percent), and then arts and crafts (14 percent), with all other products representing 5 percent or less of total sales. The respondents reported that farmers market sales accounted for 18 percent of income in 2009, with off-farm work generating 34 percent, other farm income totaling 17 percent, and other (non-farm) income totaling 31 percent. Nearly 40 percent of vendors expected gross farmers market sales for the year to range from 0-\$1,000; while nearly 42 percent reported expected gross sales during 2009 of \$2,501 or more.

Oberholtzer, L. (2004). *Community Supported Agriculture in the Mid-Atlantic region: Results of a shareholder survey and farmer Interviews*. Cockeysville, MD: Future Harvest CASA (Chesapeake Alliance for Sustainable Agriculture).

Oberholtzer presents findings from interviews with CSA farmers and surveys of CSA shareholders in the mid-Atlantic region of the United States. In 2001 and 2002, interviews were conducted with 11 current (at that time) farmers and two former CSA farmers in Pennsylvania, Maryland, and northern Virginia. The selected farms represented a range of CSA operations and philosophies. The findings show that the CSA farms had a median of six acres under production. The median number of paid workers (which includes farmers, part-time seasonal employees, etc.) hired on the CSA farms was 2.4 (with a range of 1.5 to 8.2). Most farmers reported that the CSA covered expenses, and some felt that it generated a decent wage for the farmer, though many also relied on off farm income and benefits. The average number of years of farming experience was 11, with an average of 4.2 years running the CSA.

Regarding motivations for pursuing a CSA marketing channel, most interviewees discussed the economic aspect of the CSA model—namely, securing funds before each production season— as a primary reason, although some still struggle financially. Most of the CSA farmers also were found to have a strong environmental ethic, citing organic production as an important component of their farming activities. Indeed, 10 of the farms were certified organic, and the remaining three considered their production organic but were not certified. Six of the respondents generated all of their farm income through the CSA operation. The

remaining respondents pursued various other market outlets including farmers markets, restaurants, and local food stores, among others.

Most farms were satisfied with their current number of shareholders, with only a few expressing interest in increasing shareholder capacity. Regarding retention of existing shareholders, the farms reported an average yearly retention rate of 53 percent, with a range of 10 to 90 percent. All farmers, irrespective of retention rates, reported “very positive” relationships with their shareholders. The primary challenges to running a CSA operation included membership retention and marketing demands, farmer income, labor, logistics, and communication issues.

O’Hara, J., & Parsons, R. (2012). *Cream of the crop: The economic benefits of organic dairy farms*. Cambridge, MA: UCS Publications, Union of Concerned Scientists. Retrieved from http://www.ucsusa.org/assets/documents/food_and_agriculture/cream-of-the-crop-report.pdf

In this 2012 report, O’Hara and Parson estimate the economic value of organic dairy farming in Minnesota and Vermont. The analysis relies on financial data from both organic and conventional dairy farms in each state and uses state-level input-output models to calculate economic impacts. The results show that the indirect effect of dairy production in Minnesota has a greater impact on employment, labor income, state product (the sum of all value added by industries in the state), and output than does the induced effect. In total, the state’s 114 organic dairy farms contribute \$78 million in output, 660 jobs, \$32 million in gross state product, and \$21 million in labor income to the state economy. The analysis also estimates the comparative impacts of growth in the organic and conventional dairy sectors, showing that the economic impact of increased sales for organic dairy was greater than that for conventional dairy, in both states. The study demonstrates the potential for the organic dairy sector – and perhaps other specialty agricultural sectors – to generate increasing opportunities and jobs in rural economies in the Upper Midwest.

O’Hara J., & Pirog, R. (2013). *Economic impacts of local food systems: Future research priorities*. *Journal of Agriculture, Food Systems and Economic Development*, 3(4), 35–42.

In this article, O’Hara and Pirog focus on economic impact analysis, noting that a variety of factors limit the ability of scholars to draw “overarching conclusions” from research undertaken to date. Published findings from economic studies of food systems present a number of issues, from unstated methods and assumptions to an absence of reviews by peers in the field. At the invitation of Michigan State University’s Center for Regional Food Systems and the Union of Concerned Scientists’ Food and Environment Program, a group of economists and food system researchers met in early-2013 to consider these challenges and make recommendations. As part of their work, the group reviewed well-documented studies that examined the regional economic impact of local food markets and their impact on farm operations, as well as econometric analyses looking at sales of locally produced foods in multi-state regions and the United States. The scholars identified best practices to improve the links between local foods and economic change and development, and to establish better research methods. Best practices identified include improving data collection about local food production and consumption; expanding the geographic scale of food systems impact analysis; and looking beyond the typical impacts associated with regional economic analysis, such as jobs and income. The authors also suggest including other metrics such as spillover economic effects from farmers markets, as well as elevations in local social capital.

Otto, D., & Varner, T. (2005). *Consumers, vendors, and the economic importance of Iowa farmers markets: An economic impact survey analysis*. Ames, IA: Leopold Center for Sustainable Agriculture, Iowa State University.

Otto and Varner calculate the economic impact of statewide sales from farmers markets on the regional economy in Iowa in 2004. The researchers estimate total farmers market sales of \$20 million using data consumer surveys. Based on these estimates, the IMPLAN model calculates that farmers market activity directly and indirectly generates about \$31.5 million in gross sales, \$12.2 million in personal income, and over 140 full-time-equivalent employment positions. These estimates translate into multipliers of 1.58 for gross sales and 1.47 for personal income effect from farmers market activity. The direct effects of the farmers market activity had the greatest impact on sales, income, and jobs, but the induced effects - while substantially less - were consistently greater than the indirect effects.

Pansing, C., Fisk, J., Muldoon, M., Wasserman, A., Kiraly, S., & Benjamin, T. (2013). *North American food sector, part one: Program scan and literature review*. Arlington, VA: Wallace Center at Winrock International. Retrieved from <http://www.ngfn.org/resources/ngfn-database/knowledge/Program%20Scan%20and%20Literature%20Review.pdf>

Pansing et al. provides a synthesis of research on the potential for the national food sector to promote sustainable economic development. The report is divided into two sections. The first section synthesizes research on the economic development outcomes of urban investments in the food sector, and the second compiles case studies on innovations in food systems, such as food hubs, food incubators, farmers markets, and farm to institution initiatives. The research finds that the food sector is one of the largest in the domestic economy - accounting for 30 percent of jobs in the United States - and is expected to experience continued growth. The food industry generally has high economic development returns, although food businesses also have high rates of failure.

As for local food, the authors predict a continued growth in demand for local and regional food into the foreseeable future, with growth concentrated around urban centers. They find that 30 percent of consumers are now willing to change where they purchase food in order to access locally or regionally sourced food. They also cite an increasing interest among larger national and multinational food businesses and venture capitalists in markets for locally and regionally sourced food. These actors are increasing investments in local food businesses. Regarding the economic impact of local food systems, the authors find that for every \$1 invested in local foods, an additional \$1.30 to \$4.00 is invested in the local economy. And for every job that is created through local food production, an additional 1.2 to 6 are created in the larger economy. The authors find that production and processing yield the highest local multiplier effects and highest wages. Overall, this research shows that the local and regional food sector has the potential to serve as a significant driver for economic growth, job creation, and increased access to healthy food.

Park, T., Mishra, A. K., & Wozniak, S. J. (2013). Do farm operators benefit from direct to consumer marketing strategies? *Agricultural Economics*, 45(2), 213-224.

Park et al. investigate the degree to which management and marketing skills influence farmers' selection of direct marketing strategies. The study employs a multinomial logit model using national level data from the 2008 Agricultural Resource Management Survey. (For basic information on multinomial logit models, see this Wikipedia page: http://en.wikipedia.org/wiki/Multinomial_logistic_regression.) The model shows that

management and marketing skills significantly affect direct-to-consumer sales. Farmers with higher degrees of marketing skills are more likely to participate in intermediated markets and direct marketing strategies, while farmers who participated in only direct-to-consumer sales are shown to use the fewest marketing skills. Those farmers that used only direct-to-consumer strategies reported significantly lower earnings than those with other strategies. As such, farmers with a larger set of marketing skills are shown to be more likely to increase farm sales compared with farmers who used fewer marketing skills.

Pirog, R., & O'Hara, J. (2013). *Economic analysis of local and regional food systems: Taking stock and looking ahead*. East Lansing, MI: MSU Center for Regional Food Systems, Michigan State University. Retrieved from <http://foodsystems.msu.edu/uploads/file/resources/econ-analysis-brief.pdf>

The authors coordinated a national gathering of applied economists and food system researchers in early-2013 to consider the state of economic analysis of local and regional food markets. This brief report summarizes what was learned during these discussions. While a great deal of local and regional food system research has been completed in recent years, Pirog and O'Hara express concern that this body of work does not support a compelling set of broad answers about the economic impacts of producing and selling local foods, and they note that the quality and consistency of research can be improved. The group of scholars agreed that progress is needed in food system research design and methods and proposed studies identifying and accounting for opportunity costs when assumptions about local foods affect other market factors. It was recommended that those commissioning an economic impact study consider project goals, audiences, study region, markets involved, methods, relevant previous studies, and the potential to create a project advisory team. Finally, the scholars appealed for appropriate public policy and funding to underwrite additional local food system research.

Sachs, E., & Feenstra, G. (2008). *Emerging local food purchasing initiatives in Northern California hospitals*. Davis, CA: Agricultural Sustainability Institute, University of California-Davis. Retrieved from http://www.sarep.ucdavis.edu/sfs/files/Farm_To_Hospital_WebFinal.pdf

Sachs and Feenstra present findings from the experiences of existing farm-to-hospital programs in the Bay Area of Northern California. They gathered data through phone and in-person interviews with 10 chefs and foodservice directors at hospitals in 2007. The interviews revealed the following common motivations for participation in farm-to-hospital initiatives: promoting healthy eating and high-quality fresh produce for dietary disease prevention; acquiring greater access to information on production processes and nutrition; using collective purchasing power to advocate for sustainable food systems that improve public and environmental health; supporting markets for local growers; and potentially saving money. The study found that a number of institutional factors may affect hospitals' purchase of local foods. Notably these include patient dietary regulations, menu rotation procedures, relationships to larger hospital networks, and service division between patient meals, cafeterias and catering. The leading barriers to increased local food purchasing among hospitals include financial constraints, contract stipulations, large-volume needs for certain products, lack of staff skill or administrative buy-in, and lack of local supply to meet specific needs. To increase local food purchasing within this context, the authors recommend embarking on small or informal projects within the existing institutional framework, while simultaneously adopting strategies to influence institutions and suppliers to change.

Schmit, T. M., & Bills, N. L. (2012). *Agriculture-based economic development in NYS: Trends and prospects*. Ithaca, NY: College of Agriculture and Life Sciences, Cornell University. Retrieved from <http://dyson.cornell.edu/outreach/extensionpdf/2012/Cornell-Dyson-eb1211.pdf>

Schmit and Bills present baseline economic information on the status and trends of agricultural and food system activity in New York State as of 2007. From data obtained from the 2007 U.S. Census of Agriculture, they found that farm businesses have been consolidating into larger economic units over the last 50 years. From 2002 to 2007, the number of farms in the state decreased by 2.4 percent. This trend in farm consolidation, along with increasing competition for land from non-farm uses, has also led to a continuous decline in farm acreage. Land in farms decreased from 16 million acres in 1950 to just over 7 million acres in 2007. However, amidst this changing landscape, the number of smaller part-time farms has been increasing in the last decade. In fact, about 40 percent of New York farms are residential farms, where the operator has a full-time, non-farm job. The number of farms selling direct-to-consumer increased 14.8 percent between 2002 and 2007, and Schmit and Bills report that as of 2012, 15 percent of all New York State farms sold foods directly to consumers. However, these 15 percent of farms earn only about 1.8 percent of annual statewide agricultural sales. .

Schneider, M. L., & Francis, C. A. (2005). Marketing locally produced foods: Consumer and farmer opinions in Washington County, Nebraska. *Renewable Agriculture and Food Systems*, 20(4), 252-260.

Schneider and Francis examine the potential markets for locally produced foods in Washington County, Nebraska. The study used self-administered mail surveys to collect data from a stratified sample of consumers and producers for their perspectives on production, marketing, and purchasing of local foods. The study also gathered secondary data on local food markets and restaurants to supplement the survey data. The results found that the local food system is not well developed and that commodity grain production is the predominant and increasing form of agriculture. The consumer surveys revealed widespread interest in supporting a local food system. Consumers expressed interest in buying local food directly from farmers, farmers markets, local grocery stores and restaurants, while also expressing a willingness to pay a price premium for locally produced foods. These findings indicate a significant market potential for local produce.

However, the producer surveys revealed that farmers do not share an interest in using these markets for selling crops. As such, the data shows a significant gap between consumer demand and the willingness of producers to fill the demand. The authors cite the dominance of commodity grain crop infrastructure and incentives in the region as a barrier to the development of local food systems. However, the authors also note that the number of farmers required to meet this demand is unknown and that farmers' willingness to produce local food (as of 2005) may be sufficient – just not yet realized. The study indicates a need for further research on the productive capacity of farmers to meet local demands, and it highlights challenges in local food production models within systems that are largely invested in conventional commodity agricultural production.

Strohbehn, C.H., & Gregoire, M.B. (2004). Local foods: From farms to college and university foodservice. *Journal of Foodservice Management and Education*, 1(1).

Strohbehn and Gregoire investigate the experience and perception of local food purchasing by higher education foodservice operations in Iowa. In 2003 a survey was mailed to 34

college and university foodservice directors at all higher education institutions in Iowa that offered dining services. Twelve usable surveys were returned, representing a 36 percent response rate. The findings reveal that food service directors' highest ranking concerns regarding institutional food purchasing were food safety, certified production practices, and product quality. At the same time, the food service directors assumed that the most highly ranked concerns for students would be flexible meal plans, increased menu options, and low prices. The authors argue that in order for foodservice buyers to work successfully with local food producers, several important factors should be addressed, including assurance of consistent high quality, safely handled food products, adequate and consistent supply, competitive pricing, ease of ordering, delivery and payment procedures, and standard size packages.

Swenson, D. (2010). *Selected measures of the economic values of increased fruit and vegetable production and consumption in the Upper Midwest*. Ames, IA: Department of Economics, Iowa State University. Retrieved from <http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2010-03-selected-measures-economic-values-increased-fruit-and-vegetable-production-and-consumption-upper-mid.pdf>

Swenson uses state-level data and input-output models to analyze the economic value of increasing production of local food produce in a six-state region in the Upper Midwest, including Illinois, Indiana, Iowa, Michigan, Minnesota, and Wisconsin. In an import substitution scenario where the production of 28 fruits and vegetables was expanded to meet seasonal demand, the greatest economic value in terms of output, labor, and jobs would be derived from the direct impact. The indirect and induced values are substantially less than the direct values, but are fairly comparable within each category of production, varying by state. It is estimated that this scenario would produce \$3.31 billion in retail sales of local produce, which would result in 9,302 total jobs in the region and \$395 million in labor incomes, which is substantially higher than the outputs generated through conventional agriculture (corn and soybean production) on these acres. Additionally, by selling 50 percent of this produce through direct marketing, about \$287 million would be generated in labor incomes. This study provides evidence of the economic benefits of substituting imported food to local food, when seasonable.

Swenson, D. (2009). *Investigating the potential economic impacts of local foods for Southeast Iowa*. Ames, IA: Leopold Center for Sustainable Agriculture, Iowa State University. Retrieved from <http://www.leopold.iastate.edu/pubs-and-papers/2010-01-local-foods-southeast-iowa>

In a 2009 study, Swenson, looked at the impact of replacing imported food with locally grown food items in Iowa. The analysis relied on a state-level, online produce market calculator to estimate the current food demands and potential production capacities of the region. These figures were then applied to an input-output model to estimate economic impact of the import substitution scenarios. Accounting for both the limits of the growing season and for the proportional losses in the displaced corn and soybean production, the analysis predicts net regional gains in output, jobs, and labor under two scenarios for import substitution. In both scenarios, the direct impact accounts for the greatest portion of total economic impact on output, jobs, and labor income. The indirect impact shows the next greatest impact, while the induced impact is the smallest. More specifically, an import substitution change for eight identified fruits and vegetable items is predicted to generate over \$730,000 net gains in output, over \$215,000 net gains in labor income, and 5.3 additional jobs for the regional economy.

Tegtmeier, E., & Duffy, M. (2005). *Community Supported Agriculture (CSA) in the Midwest United States: A regional characterization* (Report No. 12577). Ames, IA: Leopold Center for Sustainable Agriculture, Iowa State University. Retrieved from <https://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2005-01-community-supported-agriculture-csa-midwest-united-states-regional-characterization.pdf>

Tegtmeier and Duffy present results from a 2002 survey of Community Supported Agriculture (CSA) operations in the Upper Midwest. Using a list compiled from a national database of CSA resources, the mail survey was sent to 144 CSA operators located in Iowa, Illinois, Kansas, Michigan, Minnesota, Missouri, North Dakota, Nebraska, and Wisconsin. The response rate was 43 percent. The findings show that the most highly ranked motivations for starting a CSA farm were closer relationships with consumers, assured markets for products, and stronger ties with communities. Regarding determining share price, CSA farmers said consumer willingness to pay more than market price for their products was a factor in their deliberations. While operational costs play a part in setting share prices, farmers indicated this does not necessarily include the cost of their own or family members' labor.

The study found that family labor was a crucial resource for Midwestern CSA farms. Some 79 percent of respondents indicated that family members participate in CSA work, while 65 percent reported hiring additional labor. Most respondents said they were involved in a variety of agricultural enterprises and marketed through a number of channels besides CSA; only 18 percent reported the CSA as their only farming operation. On average, the study found off-farm jobs generate nearly 50 percent of the family income among respondents, although 20 percent reported no off-farm income. CSA operations accounted for an average of 28 percent of family income, with a 15 percent median. Regarding land totals in agricultural production, including the CSA operation, the average respondents reported farming just over 30 acres (ranging from 0.75 to 640 acres, with a median of 20 acres). Land area under CSA operation averaged 6.7 acres (or 3.2 when outliers are excluded); this represents an average of 37 percent of total land farmed (mean 20 percent). Nearly all respondents said they operated organic farms (98 percent), although not necessarily under certification.

Thilmany, D., & Watson, P. (2004). The increasing role of direct marketing and farmers markets for western US producers. *Western Economics Forum*, 3(2), 19-25.

Thilmany and Watson examine trends in direct marketing channels for agricultural produce. The analysis uses data from the U.S. Agriculture Census of 2002 and from the USDA's Agricultural Marketing Service. The data reveal a 79 percent increase in the number of farmers markets in the country from 1994 to 2002, at which point the total number was more than 3,100. Further, the study documents that between 1997 and 2002, the value of agricultural products sold through direct marketing in the United States increased from more than \$591 million to more than \$812 million, despite a small decline in total sales through all channels. During this time, the number of farms engaged in direct marketing also grew by 5.5 percent, reaching 116,733 farms by 2002. Findings from this report suggest that direct marketing channels, including farmers markets, will likely play a growing role in agricultural development opportunities, but there is still a need for additional research on the relationship between direct marketing and local economic development.

Tootelian, D. H., Mikhailitchenko, A., & Varshney, S. B (2012). Can producing and marketing healthy foods create a healthy economy? *Journal of Food Products Marketing*, 18(3), 242-256.

Tootelian and Mikhailitchenko assess the statewide impact of the production and marketing of select fresh fruits, vegetables, and dairy products produced under the “Californian Grown” marketing campaign in California. With expenditure estimates from industry statistics and surveys, the researchers used an IMPLAN model to calculate the impact on business activity, jobs created due to growth in various sectors, and incremental business taxes generated. The findings show that California producers of the selected crops and dairy products generated almost \$10.8 billion in economic output, created more than 93,390 jobs, and produced more than \$3.5 billion in labor income and almost \$385.8 million in indirect business taxes, not including income taxes. Although the study is not restricted to local sales of produce, the findings demonstrate that the production and marketing of healthy agricultural crops support a vibrant state economy. The authors further note that the production of such crops likely has a positive impact on public health, which has implications for higher productivity, economic output, and other economic indicators.

Tuck, B., Haynes, M., King, R., Pesch, R. (2010). *The economic impact of farm-to-school lunch programs: A central Minnesota example*. St. Paul, MN: University of Minnesota Extension Center for Community Vitality and University of Minnesota Department of Applied Economics. Retrieved from http://www.extension.umn.edu/food/farm-to-school/research/farm-to-school/docs/cfans_asset_289518-1.pdf

Tuck et al. investigate the potential economic impact of implementing farm-to-school lunch programs in Central Minnesota. The analysis considers several price and quantity scenarios for increasing the proportion of local foods in school lunch programs, all while accounting for the displaced economic activity of such actions. The analysis first considers the economic impact of the scenarios in terms of output, and then uses IMPLAN software to predict the economic impact in terms of employment and labor income. The findings estimate that the annual economic impact of farm-to-school lunch programs ranges from an output of \$20,000 up to \$427,000, depending on how the schools use the produce and the prices paid for the local produce. In terms of the impact on labor income, the estimates range from \$2,779 up to \$62,577, depending on these same factors. Notably, while the higher price scenarios generate the highest total economic impact due to having the highest direct impact, it is the lowest price scenarios that produce the greatest ripple effects (indirect and induced effects) and therefore carry the greatest potential economic impact for the community.

United States Department of Agriculture (USDA). (2013). *The farm to school census: Minnesota*. Washington, DC: USDA. Retrieved from <http://www.fns.usda.gov/farmentoschool/census#/state/mn>

This website presents findings from a United States Department of Agriculture (USDA) national census of public school districts participating in farm-to-school programs during the 2011-2012 school year. The data focus on procurement data. The census gathered responses from nearly 9,000 school districts through an online survey, representing a 65 percent response rate. In Minnesota, 252 public school districts completed the census. Of those, 179 districts (71 percent of responding districts), were found to participate in farm-to-school program, compared with 41 percent at a national level. An additional 9 percent of Minnesota respondents indicated plans to start local food programs in the future. Of those participating during the 2011-2012 school year, 57 percent reported plans to increase the quantity of local purchases. The most commonly purchased food items in Minnesota farm-to-school programs during the 2011-2012 school year were fruits and vegetables, with the most popular being apples, tomatoes, squash, cucumbers, and watermelon. The USDA

website also provides data on specific counties in the state, but the information is general and does not assess motivation for, or barriers to, participation.

Vogel, S. (2012). *Multi-enterprising farm households: The importance of their alternative business Ventures in the rural economy* (Economic Information Bulletin 101). Washington, DC: Economic Research Service, U. S. Department of Agriculture. Retrieved from <http://www.ers.usda.gov/media/939221/eib101.pdf>

Vogel explores the role of off-farm business ventures and on-farm activities independent of commodity production for farm household income. The analysis is based on data from the 2007 Agricultural Resource Management Survey, and from the 2007 Census of Agriculture. The data show that almost one third of farm households generate income through off-farm business ventures and on-farm activities apart from commodity production. The on-farm activities include agritourism ventures, such as pick-your-own operations; commercialization of forest products; and produce sales to direct-to-consumer markets like farmers markets. The farm households that participate in additional non-commodity activities generated nearly 40 percent of the total value of US agricultural production for 2007. Further, the non-commodity income generating activities created an additional \$26.7 billion in income for 686,600 farm households in 2007. While these farm households engaged equally in off-farm business ventures and on-farm diversification activities, the off-farm activities accrued a greater portion of the total non-commodity income (80 percent of the \$26.7 billion). Income generated from on-farm activities represents only \$5.1 billion (out of \$26.7). Accordingly, farm households that engage in additional activities are found to earn incomes greater than those who do not; and those farmers who engage in off-farm ventures earned incomes that were nearly double to those not engaged in such business activities.

For on-farm diversification activities, nearly 90 percent of income was generated from custom work, direct-to-consumers sales of local food, and agritourism activities. Most of the farms engaged in on-farm diversification (about 80 percent), are small farm operators (those with annual sales less than \$250,000). However, large farm households (sales greater than \$250,000) were more likely engage in these activities, with 31 percent of large farms compared to 15 percent of small farms engaging in on-farm ventures.

Woods, T., Ernst, M., Ernst, S., and Wright, N. (2009). *2009 survey of community supported agriculture producers*. Lexington, KY: New Crop Opportunities Center, UK Cooperative Extension Service, University of Kentucky. Retrieved from <http://www.uky.edu/Ag/CCD/csareport.pdf>

Woods et al. present a summary of findings from a 2009 mail survey of CSA farmers in Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Pennsylvania, and West Virginia. A total of 757 surveys were distributed, with 205 producers returning usable surveys, for a 27.1 percent response rate. The analysis finds that about 25 percent of respondents reported no farming experience before starting their CSA, while another 29 percent indicated some farming experience –with the CSA as their first entry into direct marketing. The authors see these findings indicating that CSAs are often started for ideological reasons or as part of a hobby farm.

The findings also confirm that practitioners view CSAs as an appropriate form of entry-level agriculture for direct marketing of high-quality food. About 46 percent of the respondents hired full-time seasonal employees, ranging from 1 to 15 workers. About 30 percent hired at least one part-time, year-round employee for the CSA, and nearly 50 percent hired part-time seasonal labor –with an average of 2.6 part-time seasonal employees. The average number

of “shares” or participants receiving full shares of what the CSA farms produced was 75 members, representing an average increase of 36 percent since 2007. The most commonly cited reasons for recent CSA growth were consumer interest in locally grown and organic foods (50 respondents), word of mouth from existing shareholders (35), product quality (20), and increased level of production and marketing commitment (19). Most respondents (87 percent) indicated that they pursue additional marketing channels, with farmers markets being the most common outlet (43 percent of respondents). More than 30 percent of respondents sold directly to restaurants, 30 percent sold on site, and 26 percent sold through wholesale markets.

Regarding production practices, about two thirds of respondents said they grew produce according to organic standards, but were not certified. About 18 percent were certified organic; 15 percent used a combination of conventional and organic practices; and 1 percent used exclusively conventional production techniques. A number of CSAs (39 percent) reported using waiting lists because local demand for shares exceeded ability to supply. The average waiting list contained 27 households (ranging from 0 to 300 households), with an average wait time of one season. Using a Likert scale of 0 to 10 (where 0 was “very minor” and 10 was “very important”), the three most significant factors in setting the share price were: overhead and fixed costs of production (6.18 average), share prices of other CSAs (5.84 average), and variable operating costs of production (5.83 average).

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