

Themed Content: Intermediated Marketing Channels in Regional Food Systems

Cite this article: Dimitri C, Gardner K (2019). Farmer use of intermediated market channels: a review. *Renewable Agriculture and Food Systems* **34**, 181–197. <https://doi.org/10.1017/S1742170518000182>

Received: 9 July 2017

Revised: 6 March 2018

Accepted: 27 March 2018

First published online: 29 April 2018

Key words:

Farm to institution; farm to retail; food hubs; intermediated market channels; local and regional food systems; small- and medium-sized farms; value-based supply chains

Author for correspondence:

Carolyn Dimitri, E-mail: carolyn.dimitri@nyu.edu

Farmer use of intermediated market channels: a review

Carolyn Dimitri and Karen Gardner

New York University, New York, NY, USA

Abstract

Intermediated markets are relatively new market channels that have the potential to expand local and regional food systems while increasing the viability of small- and medium-sized farms. The intermediated channels comprise a short supply chain linking farmers with consumers through the use of intermediary such as a distributor or supermarket. In many instances, these supply chains embed social or environmental values, such as supporting local farming. In this paper, we examine the current state of knowledge about the intermediated market channel. The first source of knowledge consists of data from federal and private sources. Next, we review a selection of the published literature focusing on farmer use of intermediated market channels in the USA. The main intermediated channels include direct to institutions, such as schools and hospitals; food hubs; and direct to retail. The paper finishes by raising questions about future of intermediated markets, based on the findings of the literature review and data.

Introduction

To a large extent, consumer preferences are driving the interest in local and regional food systems. Today's consumer wants to know the source of their food, seeks transparency regarding production and wants to eat healthier foods. Local and regional food systems are uniquely poised to fill this emerging market, as they are built on many of these same tenets. In addition to providing consumers with the type of food they desire, local and regional food systems contain opportunities for small- and medium-sized farms (Feenstra and Hardesty, 2016; Knigge et al., 2016). The popular view of local and regional foods centers on direct-to-consumer sales, most often through farmers markets, community supported agriculture, farm stands and other direct-to-consumer outlets. A different marketing possibility, the 'intermediated market channel,' has emerged along with growth in consumer demand for locally and regionally produced foods, defined by USDA as sales made direct to restaurants, institutions or to regional food aggregators (Low et al., 2015). Expansion of intermediated market channels may prove beneficial for small- and medium-sized farms, by facilitating access to the growing market for local foods.

Intermediated market channels link farms with consumers, who make their purchases in locally and regionally based food retail stores, schools, hospitals and other outlets. The marketing chains are generally regionally based and are shorter than the typical conventional food supply chain (Low and Vogel, 2011). Some intermediated market channels are described as 'Value-Based Supply Chains' (VBSCs), which are supply chains configured with specific value-based goals, such as ensuring economic stability for producers (Feenstra and Hardesty, 2016). The success of the intermediated market channels depends on consumer acceptance and interest in purchasing local foods outside of the farmers market. Evidence points to consumer acceptance, as local and regional food sales through intermediated channels are increasing (Richards et al., 2017). The proportion of local food marketed through intermediated channels was 66% of local food sales in 2015 (USDA-NASS, 2016a).

Intermediated market channels are used more often by farms with annual sales above US \$250,000 (Low and Vogel, 2011). The volume produced by farms in this size category is often both too large for direct markets and too small for the conventional, national market—the classic problem of 'agriculture of the middle' (Kirschenmann et al., 2008). The firms involved in intermediated channels are better able to accommodate the sales volumes and/or aggregate the production of several farms to meet the needs of their institutional or other buyer. These channels may offer opportunities for increased farm profits through an expanded market and stabilized prices (Knigge et al., 2016).

Because intermediated markets have the potential to increase market access and the viability of local and regional farms, there has been a recent explosion in research on the topic. At the same time, federal data collection on the farm-level aspects of local and regional food systems, along with some aspects of marketing, has been greatly improved. This paper aims to examine the body of research and new data, to better understand the current state of research

considering farmer use of intermediated market channels. We begin this review paper with an assessment of the intermediated market channels, based on current data, which is followed by a review of the existing literature. Finally, future research directions are set out, based on the findings of the literature review and survey data.

Data perspective of intermediated market channels

Understanding the state of agricultural marketing channels is a daunting task, partly because marketing channels vary across product types, such as grains, value-added products, fresh produce, eggs and meat. As a result, studies require both significant amounts of data and on-the-ground knowledge of the functioning of the market channels. Until recently, the paucity of data available has been a significant obstacle to the analysis of local and regional food system market channels. As the market for local food grew in size, pressure increased for data and analysis of local and regional food systems, including a congressionally requested analysis of local food systems (NSAC, 2015). New federal and other data collection efforts have made it possible, for the first time, to provide a systematic (although incomplete) view of local and regional food systems.

The first, albeit limited, view of the marketing channels was provided by the Census of Agriculture, which in 1997 began collecting data on the number of farms and value of sales resulting from direct marketing to consumers. Following this, the Organic Production Survey, first conducted for 2008, collected data on marketing practices of organic farms, although marketing data have not consistently been included on follow-up surveys (USDA-NASS, 2010). More recent data collection efforts have attempted to better understand the extent of farmer marketing to local and regional food systems. These new federal surveys targeting local and regional foods include USDA's Local Food Marketing Practices Survey, conducted for the first time in 2015 and USDA's Food and Nutrition Service's 2013 and 2015 Nationwide Farm to School Census of local and regional foods purchased by public school districts (USDA-NASS, 2016a,b; USDA-FNS, 2017). Finally, a privately funded survey of food hubs was conducted by Michigan State University and the Wallace Center in 2013 and 2015, covering the years 2012 and 2014, which follow an earlier Wallace Center baseline assessment of food hubs (Hardy et al., 2016). An examination of these five datasets provides a sense of the local and regional food systems at the farm-level and the corresponding intermediated markets (Table 1).

Farms marketing direct to consumer

Trends in farmer use of direct-to-consumer markets can be assessed at 5-year intervals from 1997 to 2012 (see Fig. 1). All measures suggest that the use of direct-to-consumer market channels increased over this period. The number of farms marketing directly to consumers increased from approximately 111,000 to 145,000 farms over the 15-year period, although growth between 2007 and 2012 was relatively flat. Farm-level sales in 1997 of US \$590 million grew to US\$1.3 billion in 2012 (USDA-NASS, 2014a; USDA-NASS, 1999). Average direct-to-consumer sales per farm increased nearly 70% during this period, to approximately US \$9000 (USDA-NASS, 1999; USDA-NASS, 2014a). One new piece of data was collected in the 2012 Census of Agriculture, which reported that nearly 50,000 farms marketed through intermediated channels (USDA-NASS, 2014a).

Marketing by certified organic farmers

Since at least 2002, USDA's Economic Research Service has reported that organic farmers use direct-to-consumer markets at higher rates than conventional farmers (Greene et al., 2017). That conclusion was based on qualitative data, industry reports and anecdotal evidence since there were no official federal statistics available to describe the organic sector until 2008. Yet despite the promise of such data, inconsistencies in the data collected create challenges for analysis. While production data are available for 5 years (2008, 2011, 2014, 2015 and 2016), marketing data were excluded in 2016. In 2011 and 2015, exempt farms (those who have sales of organic products below US\$5000 a year) were excluded from the data collection, while other years include both certified and exempt farms. For 2008, 2011 and 2014, both the number of operations and the percent of sales by market channel are reported. For 2015, only the number of operations is included, and for 2016, no marketing data are reported. Due to these inconsistencies, the examination of changes in market channels used by organic farmers is necessarily incomplete.

Using the partial data, the following two charts describe market channel use by certified organic farms. For consistency, the charts exclude data on exempt farms for 2008 and 2014. The first (Fig. 2) indicates that the percent of sales sold via intermediated channels increased between 2008 and 2014, while the percent of sales marketed directly to consumers fluctuates. Note that the smaller farms that meet the conditions for exempt status likely rely on direct-to-consumer sales at a higher rate than the larger certified organic (Dimitri and Greene, 2000). Furthermore, the number of exempt farms may be sizable. For example, in 2014,

Table 1. Available datasets covering local and regional food marketing

Dataset	Coverage	Years	Funding
Census of Agriculture; USDA	Direct to consumer, farms and sales	From 1997	Federal, permanent
Organic Survey, Census; USDA	Marketing channels for organic farms; inconsistent data collected	2008, 2011, 2014, 2015, 2016	Organic Data Initiative (Farm Bill)
Local Food Marketing Practices Survey	Marketing data for farms selling into local and regional food systems	2015; planned 2017	2014 Farm Act
Farm to School Census; USDA	Use of local foods by schools and some procurement data	2013, 2015	Healthy, Hunger Free Kids Act 2010
National Food Hub Survey	Financial, demographic and other data about food hubs	2012, 2014, 2016 in field	Private foundation

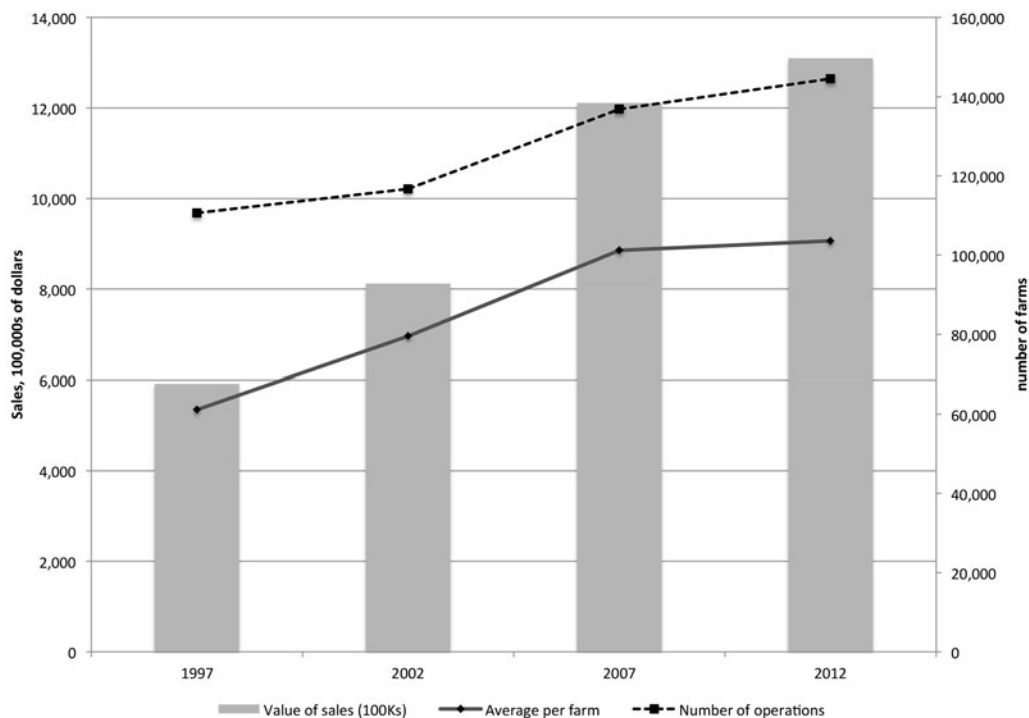


Fig. 1. Farmer to consumer markets, farm operations and sales: 1997–2012. Notes: Authors’ calculations of Census of Agriculture Data. Sources: USDA-NASS, 1999, 2004, 2009, 2014b.

approximately 1500 farms were organic and exempted from the certification requirement; in 2008, the exempt firms numbered roughly 3600 (USDA-NASS, 2010, 2015). Thus, the percent of sales sold directly to consumers, as shown in the following figure, likely understates the true share.

Trends in certified organic farm numbers, both total and by market channel, are displayed in Figure 3. The 2011 data show

a decrease in the number of farms from 2008, which may be partially explained by the fact that data on operations producing floriculture, Christmas trees and mushrooms were collected in 2008, omitted in 2011, and then reinstated for subsequent surveys (USDA-NASS, 2012). In terms of farm numbers, the percent of farms marketing locally and regionally, including direct-to-consumer and through intermediated channels, slightly declined

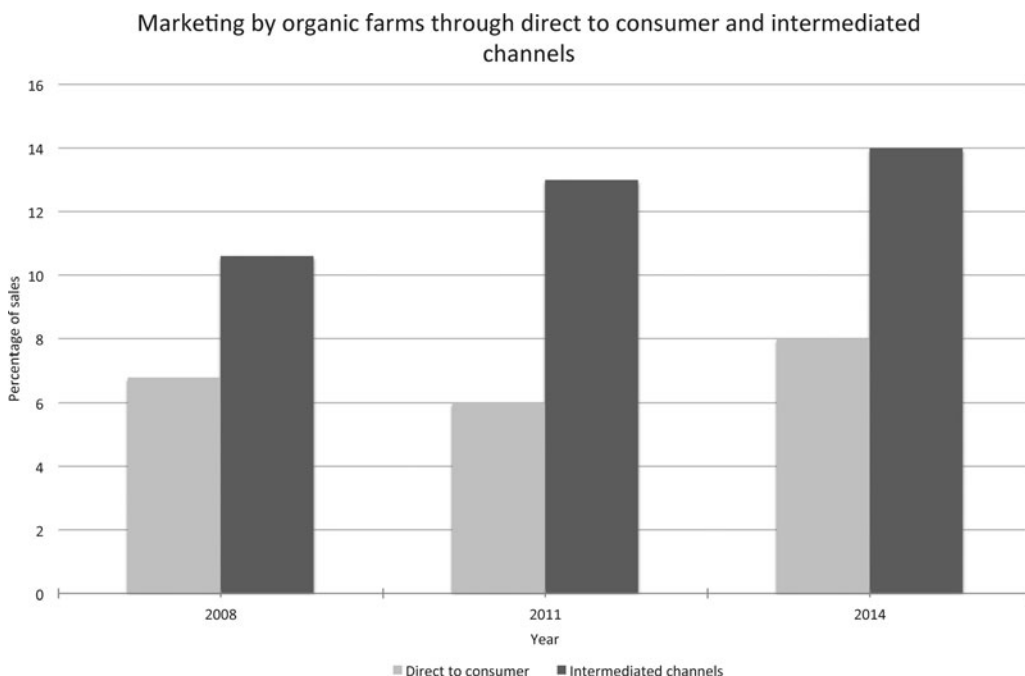


Fig. 2. Marketing by certified organic farms through direct-to-consumer and intermediated channels, percent of sales: 2008, 2011 and 2014. Notes: Authors’ calculations of Organic Survey data. Sources: USDA-NASS 2010, 2012, and 2015.

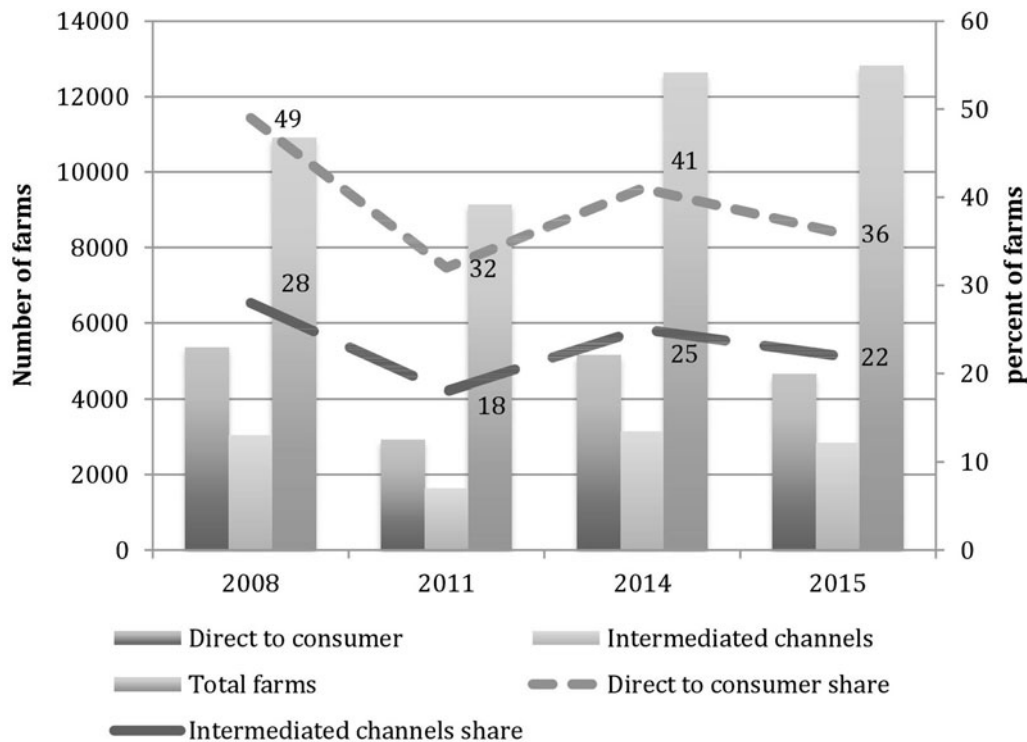


Fig. 3. Number and share of organic farms accessing local and regional market channels, by channel type: 2008, 2011, 2014 and 2015. Notes: Authors' calculations of Organic Survey data. Sources: USDA-NASS 2010, 2012, 2015, and 2016a,b.

from 2008 to 2014. The shift in market channel usage accompanies a restructuring of the organic sector, which continued its movement from a separate, niche market to one that is now seen as an integral part of the national food system (Dimitri and Richman, 2000; Dimitri and Oberholtzer, 2009).

Local marketing practices of all farms

The next significant contribution to data on local and regional food systems focused on farm marketing practices. The 2014 Farm Act directed USDA to conduct a special study on the marketing of local and regional foods (USDA-ERS, 2017). The resultant data collection was implemented in 2016 when the USDA's Local Food Marketing Practices Survey collected marketing data from farmers for the year 2015. The results of the survey indicate that intermediated channel sales were valued at US\$5.8 billion, which included sales made directly to retailers, intermediaries and institutions. An additional US\$3 billion was marketed directly to consumers. Approximately 57,000 farms sold food into the local and regional food system through intermediaries or to institutions, and of this amount, 24,000 farms sold directly to retailers. Approximately 115,000 farms sold directly to consumers (USDA-NASS, 2016a,b). A second marketing survey is planned as a follow up to the 2017 Agricultural Census (USDA-NASS, 2016a,b).

Farm to school census examines school use of local foods

A separate federal effort examined the use of local foods in schools through the USDA Farm to School Census. Unlike the organic and local food surveys, the Farm to School Census examined the use of local and regional foods in K-12 schools rather than farm-level production and marketing. USDA's Food and

Nutrition service collected data for 2015 and 2013. In 2015, private, public and charter schools were surveyed, while the 2013 data apply to public schools (USDA-FNS, 2016). The 2015 findings, which covered the 2013–14 academic year, indicate that 42% of responding school districts sponsored farm to school activities. The most common farm to school activity reported is the use of local foods in the school cafeteria. The 2015 census reports that schools purchased US\$790 million of local foods in 2013–14. Approximately 40% of schools purchased directly from individual farmers, while about 60% purchased local foods through an intermediary (USDA-FNS, 2016).

Food hubs

A recent business innovation in the intermediated market channels is the 'food hub,' which is a business that actively markets source-identified food products (Barham et al., 2012). Food hubs, through their aggregation and distribution activities, are poised to help small- and medium-sized farms gain access local and regional markets (Feenstra and Hardesty, 2016). Food hubs have proliferated around the nation, with at least 547 such businesses identified in 2015 (Hardy et al., 2016), markedly larger than the 222 identified in 2013 (Fischer et al., 2013). Although they are estimates, the numbers are suggestive of growth in the number of food hubs.

Baseline information, growth and operational characteristics of food hubs was collected by Michigan State University's Center for Regional Food Systems in 2013 and 2015, and in 2011 by the Wallace Center (Barham et al., 2012; Fischer et al., 2013; Hardy et al., 2016). The 2011 baseline findings were not published. At the time of writing, the 2017 Food Hub Survey was out in the field. Table 2 presents select information from the 2013 and

Table 2. Select findings of the National Food Hub Survey

Attribute	2012	2014
Food hubs (number responding)	106	149
Gross revenue (millions of dollars)	322	370
Gross revenue per hub (millions of dollars)	3.74	3.27
Number of suppliers (average)	80	83
Years in business (median)	4	4
Years in business (average)	11	8

Notes: The 2015 Food Hub survey reports on 2014; the 2013 Food Hub survey reports on 2012. For gross revenues, $N=86$ in 2012 and $N=113$ in 2014. Sources: Fischer et al., 2013; Hardy et al., 2016.

2015 National Food Hub survey, which apply to the years 2012 and 2014. The data, despite not being representative, are illustrative of trends in food hubs. One finding is that while the number of food hubs responding in 2015 was 40% greater than in 2012, little difference in operational characteristics exists between the 2 years.

Food hubs are a key part of intermediated markets, but they also operate as direct marketers. Direct to consumer food hubs comprised 20% of the respondents in 2014, with 28% selling to intermediated channels and 52% serving both direct and intermediated markets (Hardy et al., 2016). A significant finding is that food hubs remain a relatively new part of regional food systems, with about 60% of respondents reporting being in business for 5 or fewer years in 2014 (Hardy et al., 2016).

The importance of geography

It has long been understood that urban dwellers are an important consumer base for local and regional food systems. The Local Food Marketing survey found that the majority of farms (80%) sold their products within 100 miles of the farm's location and 67% of the sales were from farms located in metropolitan counties (USDA-NASS, 2016a,b). Other research has shown the importance of geography in terms of local and regional food system development. Farms located on the West Coast are typically located in rural settings, whereas farms in the Northeast are closer to cities. As a result, out of necessity, 85% of local food sales on the West Coast are marketed through an intermediated channel (Low and Vogel, 2011). The 2015 Food Hub survey does not directly address urban or rural locations, but the 2013 survey indicates that approximately half of the food hubs were located in counties with populations equal to or greater than 1 million (Fischer et al., 2013). Counties with 100 or more farmers using intermediated market channels are concentrated in the population-dense regions of the Northeast, Mid-Atlantic and the West Coast (Low et al., 2015). Taken as a whole, research suggests that the intermediated market channels may effectively strengthen the tie between urban consumers and regional farmers.

Methodology for literature review

A search for published research addressing farmers' use of intermediated markets relied on use of key words, such as 'food hubs,' 'farm to institution,' 'farm to school,' 'intermediated market channels,' 'regional food systems,' 'local food systems,' 'direct to retail' and 'value-based food chain,' in successive Google scholar searches provided a wide array of publications. Only studies

specifically addressing farmer use of intermediated marketing strategies were included in this review. Studies that analyzed consumer utility, willingness to pay, direct-to-consumer market channels and economic benefits of intermediated market channels were excluded. Similarly, as the US market is the focus of this paper, research focusing on other countries was excluded.

The resulting 41 papers (listed in Table 3) were published in peer-reviewed journals, peer-reviewed research from USDA ERS, conference proceedings, book chapters, and reports and papers in the gray literature. Altogether, the papers examine the complete range of intermediated marketing channels: supply chains (13), food hubs (12 papers), direct to retail (eight papers) and direct to institution (eight papers). The review is organized by four themes: the difference between intermediated market channels and conventional supply chains; the potential for including social value into the supply chain; the importance of farmer prices; and challenges of fitting a new procurement ideology into the existing business models. While other organizing themes exist, these were selected for their contribution to our understanding of how new marketing models may benefit farmers.

The literature most often describes the shorter supply chains that make up local and regional food systems as a 'value-based supply chain'. As such, the phrases value-based supply chain and intermediated marketing channel are used interchangeably. Technically, an intermediated market channel does not require the incorporation of values, but in practice, as shown below, most researchers and practitioners consider the inclusion of values to be a key part of the intermediated market channel.

Theme 1. Essential differences between intermediated market channels and conventional supply chains

In discussing the vision of and potential benefits of intermediated markets or value-based chains, the literature offers detail about differences between the conventional and intermediated supply chains. Although there are many, the main difference is the philosophical perspective. At the extreme, the conventional supply chain model rewards firms and farms for efficient, low-cost production, and buyers and sellers are largely indifferent toward others in the market. Independent and anonymous transactions dominate the food system. At the other extreme, the value-based supply chain considers social and environmental factors as equal in importance to economic factors. In the intermediated, value-based market, buyers consider farmers and ranchers as strategic partners, not anonymous input suppliers (Stephenson et al., 2011). Increases in scale are obtained not by increasing the size of an operation, but by joining the production of multiple farms and ranches (Stephenson et al., 2011). Of course, in reality, extreme cases rarely exist, but the contrast is a helpful way to contextualize the new, intermediated market along with the modern food system.

Overall, there is a greater shared vision and shared responsibility among firms in the value-based chain, in comparison with the conventional food system. This requires the formation of strong, strategic partnerships, which provide benefits to all firms in the intermediated market supply chain. Scaling strategies within the Ohio regional food system are relationship-based (Clark and Inwood, 2016). Good relationships were identified as a key component of success in four Northeastern hubs (Severson and Schmit, 2015). Informal networks are used to coordinate marketing efforts (Diamond and Barham, 2011). Partnerships may include written agreements with integral partners such as school

Table 3. Literature reviewed, by thematic area

Value-based supply chains/supply chain	
Christensen et al., (2017). <i>Assessing market channel performance for Colorado fruit and vegetable producers</i>	A case study of Colorado fruit and vegetable growers, which explored the use of Cornell's tool 'Market Channel Assessment Tool.' The tool aims to collect financial and other data to allow farmers to make better marketing decisions. The case study explored non-commodity market channels, wholesale, farm to school and direct-to-consumer markets. They identify four best practices in terms of recruiting farmers to use the tool, which includes offering incentives for participations, developing relationships with farmers, use farmer referrals and make farm visits to collect data from producers
Clark and Inwood (2016). <i>Scaling-up regional fruit and vegetable distribution: potential for adaptive change in the food system</i>	The authors consider existing food chains in Ohio and their capacity to scale up local food production through regional distribution using existing grocery stores, thus relying on existing infrastructure as an intermediary for regional or value-based food produced by marginalized small or medium producers to be efficiently distributed in a broader market. Small- and medium-sized distributors and retailers showed more opportunity, flexibility, interest and commitment to these reconfigured supply chains, and Ohio farmers and distributors found more ease of entry in said small and medium retailers than they did with large retailers. Therefore, the authors recommend that the Ohio Food Policy Advisory Council facilitate connections among smaller growers and distributors
Conner et al., (2011). <i>Value chains for sustainable procurement in large school districts: fostering partnerships</i>	The authors consider two separated projects to connect medium-sized farms to large school districts, in an effort to restructure the school districts food supply chain for the acquisition of more healthy, local and sustainable foods. They find that both schools' food service staff were essential in delivering extensive knowledge of the opportunities and constraints within their schools; that local partnerships supplied key knowledge of local food supply and assistance in overcoming long-existing problems; that agreements institutionalized in writing helped secure complicated relationships and that outside financial assistance may be necessary to initiate large-scale change
Diamond and Barham (2011); <i>Money and mission: moving food with value and values</i>	Considering a variety of value-based supply chain case studies, the authors describe a set of strategies and needs of successfully restructured food value chains. They find that: private infrastructure investment must match the organizational stage of development and market opportunities; clear identity preservation (based on production process, region, or quality) is necessary for marketing; informal networks can assist logistically to coordinate marketing efforts among farmers; non-profits may be key to developing the value chain, but should focus on their specific skills; direct marketing outlets may be important for creating multiple income streams, but cannot support the majority of mid-sized farms; and strong relationships between each link in the food chain are key to the success of these marketing chains
Farmer and Betz (2016). <i>Rebuilding local foods in Appalachia: variables affecting distribution methods of West Virginia farms.</i>	The authors find that farmers in West Virginia are more likely to use intermediated marketing when they have lower levels of formal education, have larger farms and have owned their farm for a relatively long time within the family. Farmers in this area who market through direct-to-consumer methods tend to be less risk-averse and more concerned with the effects on the environment, quality of food and community health that their farming methods may have. Beginning farmers in West Virginia tend to either use only direct-to-consumer marketing or intermediated marketing rather than diversifying, even though a mixture of these two marketing strategies has lower risk than using only one strategy
Feenstra and Hardesty (2016); <i>Value-based supply chains as a strategy for supporting small and mid-scale producers in the USA</i>	Value-based supply chains' primary goals are to facilitate economic viability for producers and to ensure the supply of differentiated regional food to consumers. They can support farmers who operate on a regional scale, produce high quality, differentiated foods and are open to distributing profits among partners. VBSCs improve logistical efficiency and flexibility through long-term relationships and shared information along the supply chain. They can benefit farmers by extracting premium prices based on values, and providing a more flexible and transparent supply chain with some transaction cost absorption. However, challenges (especially for small- or mid-scale farmers) include volume requirements, regulatory constraints (including food safety), capitalization, liability issues and managing human resources. By aggregating, food hubs reduce distribution cost, but it is difficult to scale because consumers demand more retailers to shop regularly while retailers need more consumers to increase availability and reduce costs

(Continued)

<p>Hardesty, et al.; (2014). <i>Values-based supply chains: supporting regional food and farms</i></p>	<p>Value-based supply chains aim to stabilize economic opportunity for mid-scale farms and preserve rural economies. Mid-sized farms are good candidates for VBSCs because of their inability to survive solely on direct marketing, their inability to compete in the commodity market and their importance to the structure of rural economies. VBSCs restructure local food chains to promote social, environmental and economic values while increasing the scale of operations and distribution. They can be more profitable to mid-scale farmers than direct marketing as direct marketing returns are reduced by staff time, transport and other costs. These restructured supply chains are more likely to succeed if they have adequate infrastructure, efficient distribution systems, year-round distribution, have producer size diversity, or are subsidized. They are challenged by food safety concerns, difficulty in communicating values to consumers, inability to reach a wide enough consumer base and lack of business expertise</p>
<p>Hingley and Vilalta-Perdomo (2017). <i>Roles of intermediaries in developing resilient systems: a community approach to food micro-producers</i></p>	<p>The authors present a conceptual framework for food supply chains. They argue that the efficiency model may not spur small producers to participate. Transportation and transaction costs are high for small producers, attempting to gain access to the traditional markets. They suggest that collaborative strategies or other value-based approaches are more effective. Changing the view to supply communities, as opposed to a bunch of individual suppliers, reframes the problem, either as a cooperative or a democratic structure. They suggest that a new role for intermediaries is leadership in helping to create a bottoms-up decision-making structure, consisting of small producers. The authors call for empirical work to investigate the effectiveness of this concept</p>
<p>Kim et al. (2014). <i>An assessment of market strategies for small-scale produce Growers</i></p>	<p>This study considers marketing strategies of small-scale farmers, considering the risk and returns to direct and wholesale marketing channels. Using the prices for fresh produce at 16 farmers markets in Utah and Colorado, the authors build a simulation to combine price, yield and market risk in order to show expected profits of 11 different marketing options. They find that most profitable marketing combination for risk-averse producers desiring a stable profit is marketing 40% of output through direct marketing (in this case farmers markets) and 60% through wholesale channels</p>
<p>Low and Vogel (2011). <i>Direct and intermediated marketing of local foods in the USA</i></p>	<p>The authors use data from the Agricultural Resource Management Survey (ARMS) to provide the first large-scale analysis of local and regional food marketing. They find that majority of local food sales are through intermediary markets, even though there are far more small farms marketing through direct-to-consumer than through intermediaries. Larger farms tend to use intermediated markets to avoid transaction costs and because they are able to deliver consistent volumes, while smaller farms tend to use direct-to-consumer marketing in order to shorten the supply chain and receive a larger portion of the price consumers pay. Successful mid-scale food value chains are built on appropriate values of high quality, differentiated food, value-adding stories, strategic business relationships, transparency, logistical efficiency and effective supply chain management. Challenges include accessing partners, structuring relationships of transparency and trust, differentiating produce and communicating regional value, pricing appropriately, acquiring capital, business management, quality control, logistics systems and developing economic power for value chain negotiations</p>
<p>Low et al. (2015): <i>Trends in US local and regional food systems: a report to congress</i></p>	<p>While producers continue to choose to join the direct-to-consumer market, sales within this market leveled off between 2007 and 2012. As marketing through intermediaries represents a different option for marketing food locally, research has shown the direct to consumer and marketing locally through grocers are complementary markets. Industry consultants described local sourcing as a top grocer trend in 2012, which points to a burgeoning market opportunity. Obstacles cited are inadequate availability, inconvenience, and lack of knowledge about availability. USDA encourages farm-to-school sourcing and increased support for intermediated marketing channels in the 2014 Farm Bill</p>
<p>Stephenson, et al. (2011); <i>Midscale food value chains: an introduction</i></p>	<p>As demand grows for differentiated products, midscale food value chains are emerging, focused on the development of strategic business alliances among small- and medium-sized farms and other agri-food enterprises. It is essential to retain the economic viability of mid-sized farms, as this sector is key to the sustainability and stability of agriculture, national food security, and rural communities. Aggregation of high-quality, differentiated foods from different producers contributes to maintaining demanded volumes and, combined with marketing strategies, contribute to the growth of mid-sized farms. Stories of the producers (including people, land, and practices) add value to marketed food, especially if transparent and trusting</p>

(Continued)

	business relationships are maintained. Midscale food value chains are made more effective by the strategic use of logistics (such as marketing, aggregation, processing, distribution and accounting)
Woods et al., (2013). <i>Local food systems markets and supply chains</i>	The authors discuss local food supply chains, pointing out that consumers are interested in source-identified foods. For local food systems, coordinating marketing and production remains a significant challenge. Because marketing source-identified foods create scale diseconomies, new business models, such as food hubs, are developing in order to improve marketing efficiencies. Using principles of industrial organization, academics and food industry professionals need to consider performance along the supply chain and use meaningful measures when considering different, innovative supply chains
Direct to retail	
Abatekassa and Peterson (2011). <i>Market access for local food through the conventional food supply chain.</i>	This paper examines how local food producers access conventional supply channels, using a case study of Southeast Michigan. The analysis relies on semi-structured interviews with retailers and wholesalers. The main findings suggest that most significant barrier to expanding the availability of organic food is the lack of intermediaries willing to aggregate supplies of multiple farmers so that larger quantities can be delivered. Another finding is that producers are relying on other outlets in addition to supermarkets and as a consequence, the number of suppliers working with retail chains in Southeast Michigan has decreased over time
Bloom and Hinrichs (2017). <i>The long reach of lean retailing: firm embeddedness and Wal-Mart's implementation of local produce sourcing in the USA.</i>	The authors examine how the lean retailing model of Wal-Mart functioned regarding procurement practices for their local produce purchases, which are part of their sustainability initiative. The lean retailing model shifts many logistical tasks to their suppliers, which makes possible low prices for consumers. The study makes use of qualitative data collected from producers that supply fruits and vegetables to Wal-Mart and those who were recruited to supply Wal-Mart, but declined. The study found that Wal-Mart used a hybrid approach of their existing lean retailing model, and incorporated select aspects unique to local food marketing. This approach created tensions regarding centralized/decentralized supply chains, the role of intermediaries, and the standardized 'local' label, which was the antithesis to what many local producers and consumers seek in local food
Colloredo-Mansfeld et al. (2014). <i>Communities, supermarkets and local food: mapping connections and obstacles in food system work in North Carolina</i>	Using primary, qualitative data, the authors explore the tension between retail food stores and local foods, or how to market local food in supermarkets without giving up the meaning of local. They find that retailers and consumers define local differently, and the retailer definition may undermine the meaning of local in the eyes of consumers. The researchers suggest that by becoming community allies, food stores can work to build up meaningful social connections in communities. Such action may counter store policies that disconnect people
Dunning (2016). <i>Collaboration and commitment in a regional supermarket supply chain</i>	The study examines one grocery chain over a 3-year period, focusing on their procurement of local foods from small and midscale farm enterprises. Over the course of the study period, the number of stores buying directly and the variety of produce purchased directly increased, as did the number of farmer vendors. They find that conventional procurement systems are not ideal for increasing the use of local foods. One result is that even in repeated relationships, farmers and store buyers did not reveal a strong commitment to the relationship, which is less collaborative and better described as conditional. Future research should focus on other regions and other stores with local sourcing initiatives
Dunning et al., (2015). <i>The local food movement, public-private partnership, and food system resiliency.</i>	The Center for Environmental Farming Systems, affiliated with the land-grant universities in North Carolina, collaborated with a regional food chain to facilitate and promote the procurement of local foods to sell in the supermarket. The study found that private-public partnerships along the food supply chain may help promote food system resiliency, regarding response to climate or other emergency situations. The study also found that the conventional food system's elaborate and efficient supply chain can be helpful during emergencies, particularly when natural disasters disrupt food supply distribution. However, the addition of local procurement to supermarkets and food service companies can strengthen the system and improve the resiliency of national and local food market channels
Gupta and Jablonski (2016). <i>Farm impacts of farm-to-grocer sales: the case of Hawai'i.</i>	The research presented is a case study of the farmer-grower relationship in two counties in Hawai'i. Using data collected from farmer surveys in 2014, the authors estimate two models. The first is an ordered probit model designed to analyze farmer satisfaction with sales direct to grocery stores. The second is a tobit model estimating the grocer average markup on

(Continued)

	grocery products. The findings indicate that larger farms are more likely to be satisfied with nearly all aspects of sales made direct to grocers. Farms that are GAP certified are less likely to be satisfied with the requirements regarding the volume of product, lifestyle preferences, risk, associated costs, physical infrastructure, and social infrastructure. One recommendation the authors make is to examine the impact of local food sales on the store's profit margin
Oberholtzer et al., (2014). <i>Examining US food retailers' decisions to procure local and organic produce from farmer direct-to-retail supply chains</i>	The authors present the first quantitative examination of the connection between the local and organic retailing. A sample selection model is used with data from a 2008 national survey of organic retailers to study supplier interactions and company characteristics that influence a retailer's decision to procure local organic produce directly from farmers, and the rate at which they procure these products. The results show that the number of years a store has sold organic products and the size of the company, as well as aspects prioritized in choosing suppliers and past problems interacting with local suppliers, affect the outcomes
Richards et al. (2017). <i>Retail intermediation and local foods</i>	The authors hypothesize that consumers prefer to buy local foods and nonlocal foods at the same time. The hypothesis was tested by using data collected from a natural experiment set up by an online retailer in Virginia. The results of an estimated structural pricing and local content model suggest that retailers have incentives to offer local food items as a part of their grocery lines
Food Hubs	
Agbo et al. (2015). <i>Agricultural marketing cooperatives with direct selling: a cooperative- non-cooperative game</i>	The authors build a theoretical model describing a market structure, which includes both a marketing cooperative and direct-to-consumer sales. Farmers choose to sell either in the cooperative or on the local market. The authors find that participation in the cooperative creates an anti-competitive effect on the direct market, as the cooperative facilitates collusion by making farmers somewhat interdependent. As farmers choose to sell the same quantity as each other in the local market, limited quantity and stabilizing prices, this collusion protects small farmers. Also, farmers deliver more to the cooperative than when they cannot sell the produce directly, inciting farmers to produce more
Barham et al., (2012). <i>Regional food hub resource guide</i>	The guide defines a regional food hub as an entity that works closely with suppliers, aggregates or distributes food, differentiates products and aims to be economically viable while having a social mission. The report offers the first glimpse at food hubs, including the number of operations, their functions and their business models. Case studies of successful hubs are provided, in addition to the challenges of operating a successful hub. A section of the report is devoted to funding for and financing food hubs
Berti and Mulligan (2016). <i>Competitiveness of small farms and innovative food supply chains: the role of food hubs in creating sustainable regional and local food systems</i>	As small farms struggle with costs that rise toward or above their prices and commodity production increases barriers to market entry, medium and small farms are disappearing, leading to rural abandonment. Options such as food hubs provide an attempt to restructure the food system through regional value-based food supply chains focused on supply chain and market efficiencies while retaining values of sustainable food and community development. This restructuring focuses on value creation (depending on quality, locality, or sustainability) or supply chain organization (shifting from individual competition to active clustering and cooperation)
Cleveland et al. (2014). <i>Local food hubs for alternative food systems: a case study from Santa Barbara County, California</i>	In a case study of the creation of a local food hub in Santa Barbara County, California, the authors find: that scaling up from direct marketing (rather than scaling down from mainstream distribution) maintains control in the hands of actors who are more likely to make decisions based on values rather than solely profit; that structures such as quality standards, order volumes and liability insurance assist with efficiency when scaling a food hub; that any alternative food supply chain must evolve from current economic and cultural situations; and that individuals restructuring a food chain must maintain focus and motivation for the goals of the alternative system, even if compromising in economic, organizational and physical scale. The study similarly showed that the hybridization of direct marketing and large-scale distributing, embedding profit maximization within alternative supply chains, showed clear value
Fischer et al., (2013). <i>Food hubs: definitions, expectations and realities</i>	The definition of a 'food hub' is evolving. While food hubs are partly defined by a mission of handling local and regional foods, a food hub is understood to be a business 'plus' something else. Defining the 'plus' component is challenging. Some of these 'plus' categories are supporting local food systems, supporting local agriculture, and enhancing access to healthy

(Continued)

	<p>foods. The authors suggest that the term 'commitment to place' is a good description for the plus activity of the food hub. In practice, the commitment to plus is more than good intention or goodwill, but has the ability to have an impact on the food system</p>
Fischer et al., (2013). <i>Findings of the 2013 National Food Hub Survey</i>	<p>The report provides the findings of a nationwide survey of food hubs, which was filled out by 107 hubs around the USA. The findings indicate that the food hub was a relatively new form of business at the time, with 62% having been in business for 5 or few years. Other findings include information on suppliers, business form and finances. Analysis of mission statements suggests that 11 different values underlie the work of food hubs, with the values including topics such as profits (least common) and supporting farmers (most common). The report also outlines challenges, opportunities and barriers to growth</p>
Hardy et al. (2016). <i>Findings of the 2015 national food hub survey</i>	<p>This report is a follow up national survey of food hubs; the number of businesses responding increased to 149. The report updates the information collected in 2013. One new section asks about food safety and found that some hubs had all buyers requiring good agricultural practices or good handling practices, while others had no buyers with food safety requirements</p>
Knigge et al. (2016). <i>Food hubs: connecting farms with local and regional markets</i>	<p>Mid-sized farms are more flexible and innovative in farming methods, marketing strategies, and choosing crops to produce, giving them a comparative advantage in the production of a diversity of products. Food hubs, with their higher, more stable prices, aggregation, storage, marketing, distribution and processing, can offer operators of small- and medium-sized farms assistance in expanding their markets, stabilizing price and increasing profits. Once secure in a stable market, these producers tend to strategize to extend their growing season, grow a wider range of products, increase acreage and adopt sustainable business practices</p>
LeBlanc et al. (2014). <i>Building resilience in nonprofit food hubs</i>	<p>The authors conducted a qualitative study of ten non-profit food hubs in Vermont, based on analysis of semi-structured interviews with participants from each hub. The interviews took place in 2011. The hubs were either new non-profits or were added to an existing non-profit organization. Other results include the insight that farmer involvement is a key part of food hub design. Local communities were also important in influencing food hub development. The hubs provide benefits, such as farm to school distribution, consumer and producer education, and food access. None of the food hubs in the study were mature organizations, so the authors call for research in the future to evaluate food hubs that have been in business for longer time periods</p>
Matson and Thayer (2013). <i>The role of food hubs in food supply chains</i>	<p>The authors review existing research about food hubs, noting the interest in regional or local food as the primary impetus for food hub creation, with other goals such as traceability, food attribute retention, energy consumption and flavor and defined by local origin. Regionally based supply chains often focus on social or ethical returns rather than solely on profit, leading them to strategize around returning benefits to stakeholders, increasing the reach of operation and providing key services to participating producers. As food hubs scale, larger food hubs are sustained more by aggregation and delivery than by grant funding and strategic partnership. Overall, the food hub model responds to social values and consumer demand by increasing access to local food production through distribution by a shorted supply chain more flexible and able to respond to market signals</p>
Rimal et al. (2016). <i>Farm income and food hub participation: farmer attributes, attitudes and perceptions.</i>	<p>The authors base their analysis on a survey of farmers in south-central Missouri, and examine the relationship between farm gross income and stated willingness to participate in a food hub. Preliminary findings of the study suggest that producers expressed interest in the food hub due to its connections to local buyers, and this result was independent of farm gross sales. More than 60% of the producers felt the food hub would allow them to reach broader markets</p>
Severson and Schmit (2015). <i>Building success of food hubs through the cooperative experience: a case study perspective.</i>	<p>The authors conducted four case studies of cooperatives located in the Northeast. These businesses also fit the definition of a food hub. They find that most farmers are located within 25 miles of the aggregation facilities, with nearly all product sourced from within 100 miles of the facility. The cooperatives sell at wholesale prices to a range of buyers, with grocery stores, restaurants, processors and distributor/wholesalers buying the bulk of product (depending on the cooperative, as some specialize in one market channel). The authors specify best practices for aggregation, distribution, and marketing. They point out that strong relationships among growers, food hubs and buyers are essential to the success of the business</p>

(Continued)

Farm to institution	
Becot et al., (2014). <i>Institutional demand for locally-grown food in Vermont: marketing implications for producers and distributors.</i>	This paper presents research on the farm-to-institution market channel in Vermont. The analysis is based on completed surveys of 183 institutions, which included schools, colleges/universities, hospitals, prisons, nursing home, senior meal site and food shelves. The products purchased most often were apples, berries, winter squash and white potatoes. Price was the largest barrier to increasing use of local foods. Demand for local food was based on institutional desire to support local farmers, with freshness and quality other important factors. They suggest produce and eggs are good products for farmers without processing equipment; farmers seeking to break into the institutional market might consider first marketing to less price sensitive institutions, such as colleges and senior meal sites; farmers can add value to schools through sponsoring of farm trips or branding
Buckley et al. (2013). <i>Social relationships and farm-to-institution initiatives: complexity and scale in local food systems</i>	This paper examines an empirical study of relationships in farm-to-institution marketing in Michigan. The findings show that goal champions often solidified relationships and were key to negotiating the most pressing challenges of logistics and price. These relationships did not form a linear chain, but a web of complicated linkages, often holding trust and support as well as playing a key role in creative, flexible problem-solving
Conner, et al. (2014). <i>The diverse values and motivations of Vermont farm to institution supply chain actors</i>	The authors study a farm-to-institution supply chain through semi-structured interviews, examining the supply chain agents' values and goals. They find that sharing goals and motivation is key to strong supply chain growth, that for profit distributors tend to have highly profit-focused motivations, which can affect connections and distribution of goals. Farmers and buyers tend to be less profit-focused, but divided on the chain by distributors. Not-for-profit distributors tended to have more similar goals to farmers and buyers. Embedded values outside profit tended to accompany a higher willingness to pay for local food, but the price was a key constraint for institutions, especially schools
Conner, et al. (2016). <i>Value chains for sustainable procurement in large school districts: fostering partnerships</i>	The authors consider two separate projects to connect medium-sized farms to large school districts, in an effort to restructure the school districts food supply chain for the acquisition of more healthy, local and sustainable foods. They find that school food service staff were essential in delivering extensive knowledge of the opportunities and constraints within their schools; that local partnerships supplied key knowledge of local food supply and assistance in overcoming long-existing problems; that agreements institutionalized in writing helped secure complicated relationships, and that outside financial assistance may be necessary to initiate large-scale change
Dimitri et al. (2012). <i>Local food in Maryland schools: a real possibility or a wishful dream?</i>	Like many other states, Maryland is seeking new markets, such as educational institutions, to enhance the viability of small and medium farms. Using primary quantitative and qualitative data collected by the research team, this paper explores the feasibility of local food in Maryland schools. We identify the scale and socio-economic barriers to the use of local food in schools, suggesting that policy support would enhance the likelihood of long-term success of serving local food in schools
Feenstra and Hardesty (2016). <i>Using a supply chain analysis to assess the sustainability of farm-to-institution programs</i>	In farm-to-institution markets, colleges face significant transaction costs when sourcing locally and pay premium prices. Stakeholder balance a range of strategies and values, such as sustainability, crop diversity, extension methods to lengthen the marketing season, personal relationships, quality and produce and supporting the local economy. Finding a price high enough to support producers and low enough to be affordable to institutions is a challenge, especially given the seasonal constraints of local production. When considering participation in farm-to-institution markets, growers cite lack of dependable markets, to provide consistent supply, and inability to change prices as their main concerns, buyers consider reliability of delivery, year-round supply, and stable prices as the main factors in choosing producers, and distributors' main factors are the form in which they receive food and processing requirements
Krejci and Beamon (2014). <i>Assessing regional farm-to-institution food distribution systems: an agent-based approach</i>	Through an agent-based approach, this paper analyzes food supply chains in order to understand the impacts of farm-to-institution distribution, assuming that emerging localized food chains will be initiated to meet growing consumer demand, restructuring marketing and distribution channels. The model shows that: when distributors value large volumes, farmers are more likely to aggregate; as transportation costs increase farmers will consolidate and coordinate transportation; fewer farms can survive when revenues are low and operational costs are high; customer utility is higher when customers and producers interact directly and farmers prefer aggregation and marketing through intermediaries

(Continued)

Richman (2016) *Getting it there. Understanding the role of New England distributors in providing local food to institutions.*

The report reveals the results of a 2015 survey of New England distributors regarding their use of local food for institution sales. For the 56 businesses that responded to the survey, US\$366 million of sales (46% of the total) were made to institutions. Larger distributors made a smaller percent of their sales to institutions, as compared with smaller distributors. The main outlets were schools, colleges and universities, and healthcare facilities. The main barriers to local food to institution sales are lack of year-round supply and the higher prices for local food

districts, as shown in Vermont (Conner et al., 2011). Strategic business relationships can assist in decision-making, particularly for the farmers with low levels of business skills (Hardesty et al., 2014). Relationships among the many agents participating in the farm-to-institution supply chain in Michigan were found to be as important as the farmer to consumer relationship, and as was having champion available to establish and maintain support (Buckley et al., 2013). An agent-based simulation model, using parameters estimated from consumers and producers associated with a food hub in Des Moines, Iowa, finds that consumer trust in producers supplying the food hub is critical to its success of the (Krejci et al., 2016).

Communication through the entire supply chain is also viewed as an essential part of creating successful intermediated markets (Diamond and Barham, 2011). In the conventional supply chain, prices, and in some cases third-party certifications, are the most important mechanism for information transmission. In intermediated market channels, product information and its values are less easily transmitted, requiring clear information exchange along the supply chain (Feenstra et al., 2011). Sharing farmer stories with consumers may encourage them to buy local food, understand what they are purchasing and perhaps most importantly, pay a price premium (Feenstra et al., 2011). The stories add value to the agricultural products sold through intermediaries, as they differentiate the products based on quality, locality of production, sustainability or other attributes (Berti and Mulligan, 2016).

Theme 2. The potential for and challenges of incorporating social value into the food supply chain

Industry market research suggests that consumer demand for source identified food and transparency in the supply chain is 'disrupting' the food industry (Ringquist et al., 2016). While not every intermediated marketer considers social or environmental aspects of local and regional food systems, many self-identify as part of a value-based supply chain. These associated values are diverse and include social missions such as supporting local farmers, sustainability, land preservation, labor rights, economic democracy (Berti and Mulligan, 2016). The focus on values does not negate the importance of farm or intermediary profitability, but the inclusion of values means that profits are not the only or most important factor under consideration.

An advantage to the differentiated, value-based or regionalized intermediated market is the possibility of non-profit collaboration, whether through funding, staffing, business development or other forms of assistance. Non-profits may be a key figure in innovative food chain development. Conner et al. (2011) note that, based on a study of Vermont, for food system change to occur through one type of intermediated market channel (farm-to-school), external financial support may be necessary. Others have suggested that non-profits offer essential assistance in starting and maintaining structural change in regionalized food chains (Diamond and Barham, 2011). The 2015 National Food Hub survey indicates

that one-third of the responding food hubs were non-profit organizations (Hardy et al., 2016). While all of the food hubs offered similar social missions for their organizations, the non-profit hubs were more likely to indicate goals of addressing racial disparities in food access, training their suppliers regarding business practices and increasing access to healthy food in economically disadvantaged communities, although statistical significance of these differences were not reported (Hardy et al., 2016). Non-profit distributors in Vermont indicate support of non-economic values, such as food security, local agriculture and seasonal eating (Conner et al., 2014).

Operators of small- and medium-sized farms may also express value-based goals. Farmers participating in farm to the institution in Vermont find value in maintaining the integrity of local food systems, and many sell to their local schools even though it may not be profitable (Conner et al., 2014). Socially or environmentally aware farmers are better able to meet the preference of consumers in differentiated markets since they are likely to share common values. West Virginia value-based farmers are more likely to try new farming methods or approaches to farming, although a study found these farmers were more likely to sell directly to consumers than through intermediated market channels (Farmer and Betz, 2016). Nonprofit food hubs in Vermont had social missions beyond the distribution of food, although the direct markets are so strong in Vermont that not all farmers see the benefit of marketing through the non-profit food hub (LeBlanc et al., 2014). The non-profit hubs had farmer involvement, with some including farmers in decision-making and devoting time to developing strategies that worked for farmers (LeBlanc et al., 2014).

Communicating the values to consumers is a key role of the value-based intermediary. Restaurants and chefs are actively engaged in such information sharing via menus and signage, while retailers may transmit information in produce displays (Feenstra and Hardesty, 2016). Transmitting information about values throughout the supply chain is difficult to consistently implement in practice, and sharing this information can be costly in terms of time (Hardesty et al., 2014). When compared with larger firms, smaller and mid-sized distributors in Ohio were better able to transmit values information, such as produced in Ohio or on a family farm, along the supply chain (Clark and Inwood, 2016).

Based on a study in North Carolina, implementing policies that allow stores to have a larger local orientation enable retailers to build meaningful social connections in their communities (Colloredo-Mansfeld et al., 2014). Even in cases when retailers do not purport to offer social value beyond the label 'local' on their products, they are able to earn higher margins and sell larger volumes when local foods make up an important part of their product lines (Richards et al., 2017). However, while Richards et al., examine retail prices and margins, they do not examine prices paid for to suppliers, which is a key value of those participating in value-based supply chains. Feenstra and Hardesty (2016) indicate there is a need for more retailers to participate in value-based supply chains.

Theme 3. Prices, farm viability and their related challenges

A primary benefit of using intermediated channels for farmers, as identified in the literature, includes the local and regional price premiums that farmers earn. These higher prices are a key benefit of value-based supply chains, which aim to compensate farmers for values such as sustainability value or proximity to the consumer (Feenstra and Hardesty, 2016). It is hoped that the higher prices—considered fair and equitable prices by some—contribute to enhanced farm viability for participating farmers. In the ideal version, intermediated channels offer opportunities for farmers and buyers to negotiate prices, rather than having farmers face take it or leave it prices (Stephenson et al., 2011). In the same ideal world, enough consumers and increasing numbers of consumers are willing to pay higher prices.

New producers may lack the necessary business knowledge to be successful in the channels where they capture higher prices, leading some to suggest that support from more experienced producers may be necessary to increase the success of new producers (Hardesty et al., 2014). Other forms of support for farm success include a tool developed by Schmit and LeRoux (2014), which helps farmers assess their market channel options. The tool was recently tested with Colorado fruit and vegetable farmers, and new and less experienced farmers found value in the tool while experienced farmers were less interested (Christensen et al., 2017).

A study of the retailer-farmer supplier relationship in Hawai'i finds that operators of larger farms, when compared with smaller scale operations, are more likely to be satisfied with all aspects of the direct-to-retail relationship (Gupta and Jablonski, 2016). Direct to retail sales in North Carolina, however, found producers and buyers had a collaborative relationship that was also conditional; producers called retail stores when they had excess product, where they would receive roughly half their direct-to-consumer price if the retailer opted to purchase it (Dunning, 2016). Retailers were more likely to procure organic products directly from farmers if the store's priority was procuring from local producer or if price was not a high priority; furthermore, the number of years the store was involved in the organic sector positively influenced the probability of buying directly from farmers (Oberholtzer et al., 2014). In Ohio, smaller and mid-scale grocers, retailers and distributors were best positioned to purchase food raised on medium-sized farms, and larger buyers, in comparison with smaller and mid-scale buyers, reported finding price more important (Clark and Inwood, 2016).

Considering the supply chain as a whole, distributors, restaurants and other intermediaries have shown willingness to be flexible and innovative in purchasing food with sustainability values, despite higher prices (Feenstra et al., 2011). Yet it is important to consider that, while a segment of consumers is willing to pay higher prices for differentiated products, generally speaking, consumers in the USA remain price sensitive (Feenstra and Hardesty, 2016).

In contrast, participants in the Vermont farm-to-institution supply chain and committed to collaboration are willing to pay higher prices or accept lower profits (Conner et al., 2014). Of the different types of institutions in Vermont, however, schools were the least able to pay higher prices for local schools, and colleges and senior meals were the least price sensitive (Becot et al., 2014; Conner et al., 2014). Some states, recognizing the tension created by the desire to increase local food use in schools, given the requirement to use the lowest bids and have granted public schools flexibility to pay slightly higher prices for local food (Dimitri et al., 2012). Federal policy, recognizing the challenges

schools face in using local food in schools, supports serving local food in schools via The Healthy Hunger Free Kids Act of 2010 (Low et al., 2015). The Act created the Farm to School Program, housed in USDA, has a mission of increasing the use of local food in schools through grants, training and technical assistance, and research (Low et al., 2015).

Medium-sized farms may have a comparative advantage in intermediated markets as they have the capacity to produce relatively large quantities, but are small enough to be flexible in collaboration with their buyers (Stephenson et al., 2011). Low and Vogel (2011) suggest that marketing into both direct and intermediated channels may be the optimal strategy for medium-sized farms, while large farms rely exclusively on intermediated channels and small farms use direct-to-consumer channels. Kim et al. (2014) suggest that risk-averse farmers earned expected higher profits when they diversified market channels, selling both directly and through intermediated channels. Their results are based on a simulation using Utah and Colorado farmers market prices and San Francisco terminal market prices; because they used prices from the national wholesale market, their analysis does not reflect the expected profitability of selling into intermediated markets (Kim et al., 2014). Using the higher prices of intermediated market channels would likely change the optimal proportion of sales devoted to the different market channels. Taken together, the research suggests that common strategy for hedging risk among farmers is diversifying their market channels (Low and Vogel, 2011; Stephenson et al., 2011; Kim et al., 2014).

While the literature is optimistic about higher and equitable prices for farmers, in practice paying higher prices can be a struggle for buyers and it does not always happen. Interviews with institutional buyers and producers in Vermont highlight both sides: farmers may sell at a lower price, for a values reason, while buyers are not always able to pay higher prices, even if they want to, due to company policy or competition with other firms (Conner et al., 2014). Farmers were willing to sell the top quality product to Maryland schools only if they received retail prices, otherwise, they would only sell seconds (Dimitri et al., 2012). Retailers in North Carolina consider price as important when procuring local food, and will buy only when prices are low enough (Dunning, 2016). Distributors involved with farm to the institution in New England indicate that their customers want to buy local food, but feel that the local food prices are too high (Richman, 2016). Ohio distributors reported that price is always a relatively important consideration, although the importance is greatest for larger firms (Clark and Inwood, 2016). Price is the most important barrier to institutional use of local food in Vermont (Becot et al., 2014). One grower-supplier of local products to Walmart indicated that the national-level category manager for local foods asked for price reductions mid-season; the producer worked with local store managers to maintain his price, showing both the importance of personal relationships and the challenge of securing higher prices (Bloom and Hinrichs, 2017).

Theme 4. Challenges created by the existing procurement model

Producers and sellers of agricultural products face numerous marketing challenges, with many of these well known as barriers faced by operators of small- and medium-sized farms (see, for example, Kirschenmann et al., 2008). A farmer's ability to supply product is constrained by season, farm size and climate (Feenstra et al.,

2011). Shipping product of the needed size and quantities, plus navigating logistical systems can be challenging for farmers. These barriers suggest that two key challenges facing small and medium farms participating in intermediated markets are (1) the difficulty of maintaining year-round production and (2) supplying enough product to the market.

Producing the volume necessary to meet the demand of intermediated markets is a challenge for operators of small and medium-sized farms (Feenstra and Hardesty, 2016). Generating low volume is one-factor leading farms to sell direct-to-consumer (Low and Vogel, 2011). The inability to meet scale requirements is problematic in the modern food system, which is defined by year-round supplies of food and the efficiencies associated with large-scale procurement. This mindset hindered Walmart, as it sought to incorporate local produce into its lean retailing strategy (Bloom and Hinrichs, 2017). Ultimately the company needed to adopt a hybrid approach to local procurement, but doing so raised questions about whether Walmart's branding approach, when applied towards local food, would be able to reflect the unique characteristics of local food in different regions (Bloom and Hinrichs, 2017). In North Carolina, a 3-year study of local grocery chain finds that conventional procurement systems are not ideal for increasing the sale of local food (Dunning et al., 2015). The same study found, however, that the efficiency of the conventional procurement system allows retailers to effectively support communities in times of natural emergencies, such as hurricanes or other natural disasters, but that food system resiliency might be improved through increased use of local food (Dunning, 2016). These examples raise the question of whether it is possible to preserve the unique aspects of local food while marketing through wider and larger firms, and if so, how is this best accomplished.

The size and capacity of the distributor, as well as the size of the farms they work with, are all important for the success of the intermediated channels. Distributors tend to be more successful when anchored by larger farmers with the ability to provide large volumes (Feenstra et al., 2011). Others have shown that even if anchored by a few large farms, medium-sized distributors may have a comparative advantage over larger distributors in value-based or regionalized food chains. In one such case, mid-size distributors were most likely to respond positively to the option of partnering with others in order to create collaborative infrastructure, while large distributors were less likely to participate, implying a greater flexibility within the management of mid-sized distributors (Clark and Inwood, 2016). Local, smaller distributors in Vermont were able to compete with large, broad-line distributors, despite their higher prices, because their flexibility allowed them to carry more local food (Conner et al., 2014). The flexibility and innovative abilities of small- and medium-sized farms and distributors are essential both to restructuring regional food systems and to protect the viability of medium-sized farms.

The food hub's role as an intermediary offers a potential solution to the scale and seasonality problems faced by small- and medium-sized farms. Through the activities of aggregating, distributing and marketing the product of multiple producers, food hubs increase market access for farmers (Woods et al., 2013). The food hub position in the shorter supply chain reduces the cost of sharing information about products, making it better able to maintain source identification (Matson and Thayer, 2013). By maintaining source identification, the food hubs strive to receive higher prices from their buyers, to be passed on to producers (Barham et al., 2012). Distributors in the farm-to-institution supply chain in Michigan performed a similar role

of educating schools and producers (Buckley et al., 2013), suggesting that the information sharing role embraced by food hubs can be equally effectively adopted by distributors.

Because decentralized food supply chains increase the availability of local food to consumers, but increase transport costs for farmers, a food hub's transportation services have the potential to reduce farmer costs (Barham et al., 2012; Krejci and Beamon, 2014). And while food hubs cannot fill in supply gaps with local products during the off-season, during this time, many procure from outside of the region to keep their business operating year-round (Barham et al., 2012).

In the case of these new intermediaries (or of scaling supply chains up), infrastructure investment is a critical aspect of increasing market capacities. Done strategically, supply chains can gain economies of scale through larger-scale facilities, decreasing costs and prices, consequently increasing consumer purchases (Hardesty et al., 2014). Infrastructure that allows producers and consumers of local food find each other, often challenging in a thin market, may support the growth of intermediated markets, and needs to be region specific (Farmer and Betz, 2016). Additional marketing and logistics infrastructure is a key recommendation for large distributors participating in the farm-to-institution supply chain in New England (Richman, 2016). Food hub infrastructure investments have included warehouses for farmers to drop off the product, light processing equipment, cooling systems and trucks for transportation (Barham et al., 2012; Severson and Schmit, 2015). That said, each market is unique and each intermediary needs to consider the specific needs of its buyers and sellers (Severson and Schmit, 2015).

Discussion and future research directions

Growth in consumer demand for local foods, interest in source identification and the desire for transparency in the food supply chain suggest this may be a pivotal time for local and regional food systems. The extent literature discussing intermediated marketing channels reflects this potential and presents a hopeful view of the future for intermediated markets. The bulk of the research papers study specific locations, with a heavy representation of the Northeast, and more specifically, with many located in Vermont. Despite the hopefulness, more than any other factor, prices paid to farmers and prices paid by consumers appear to be an obstacle to market development; future growth is dependent on how much of a local price premium consumers are willing to pay.

The idiosyncratic nature of intermediated markets means that each location requires an individualized plan for successful market growth. Thus, the studies examining locations around the country—for example, West Virginia, Ohio, Vermont, Michigan, Maryland—are helpful in understanding the potential benefits and bottlenecks for success. The studies also identify challenges to overcome, such as how the short value chains are constrained by expectations consumers have about pricing and availability of product, created by the conventional supply chain. The literature also points to non-economic values as being important, and their subjective nature reinforces the importance of place-specific research.

The literature suggests that relationships along the supply chain are critical to the success of these new models. Relationships may take the form of farmer-to-farmer cooperation, farmer-to-buyer, or farmer network-to-buyer, comprise an essential component of the long-term success of intermediated market channels. These strategies are likely to be costly, involving

significant effort on the part of the market participants—both the sellers and buyers—especially in comparison with marketing to the large-scale industrial food system, as many of the researchers indicated. Communication about market demands, available supply, timing, aggregation and logistics, will be a key component in building long-lasting relationships. Because regionally produced food may sell for a higher price, the research indicates that the target consumer needs to receive a message about the farmers and other firms in the value-based chains.

The other major source of information, the national-level data on marketing channels, provides a new understanding of how many producers use the channels, what they are selling and the economic value of their sales. Eventually, if data collection continues, analysis of trends will be possible. This will allow researchers to identify whether consumer preferences are having a positive effect on farm-level sales into local and regional markets. However, two key aspects identified in the literature—values and local price premiums—are not reflected in the current data, and it is not easy to see how national-level data collection could be modified to incorporate these two attributes. Similarly, the data collection (at least at the federal level) does not expand our understanding of the relationships among the supply chain participants.

Despite these shortcomings, continued collection of data at regular intervals is critical, so that researchers and policymakers can track growth and trends regarding local and regional food systems. Given that the Farm Bill dictates many of the federal data collection activities, there is uncertainty about their future as much of this spending is considered outside of the baseline and is thus subject to renegotiation in each Farm Bill cycle. Thus, until the level of funding is large enough to consider their inclusion permanent, the data collection must be explicitly mentioned in each subsequent Farm Bill. Private foundations provided funding the food hub surveys, so the data collection is subject to their continued willingness to provide funding. Finally, consistency in the type of data collected over time is necessary, and this is one area needing improvement.

The data give us a sense of what is happening, and the localized research studies may have a better understanding of why it is happening. However, at this point in time, it would be helpful to understand both. Also important to understand is in which parts of the country the new supply chains might be successful; this would allow us to better understand how to support operators of small and mid-sized farms. This is an area where data collection supported by foundations (such as the National Food Hub Survey) may be able to tackle the ‘why’ in addition to collecting quantitative data on intermediaries operating in the local and regional food systems.

Despite their imperfections, for the first time, multiple data sources are available, making it possible for researchers and policymakers to have a deeper understanding of these markets. Farmer and consumer interest appear to be high, and researchers and practitioners are assessing different ventures in select locations. This raises a related and important question, regarding the longevity of intermediated markets, and whether these channels are helpful to farmers over the long term. There has been turnover in farmers markets (Stephenson et al., 2006) and questions about the resiliency of non-profit food hubs (LeBlanc et al., 2014). Understanding the causes and implications of this instability is important, as the resiliency of intermediated markets is a key component of their success in bringing new opportunities, and hopefully increased farm viability, for operators of small- and medium-sized farms.

Acknowledgments. The authors thank two anonymous reviewers for helpful feedback on this review article. Funding was provided by the US Department of Agriculture's National Institute of Food and Agriculture, 2016-68006-24739.

References

- Abatekassa G and Peterson HC** (2011) Market access for local food through the conventional food supply chain. *International Food and Agribusiness Management Review* **14**(1), 41–60.
- Agbo M, Rousselière D and Salanié J** (2015) Agricultural marketing cooperatives with direct selling: a cooperative–non-cooperative game. *Journal of Economic Behavior & Organization* **109**, 56–71.
- Barham J, et al.** (2012) *Regional Food Hub Resource Guide*. Washington, DC: U.S. Dept. of Agriculture, Agricultural Marketing Service. April. <http://dx.doi.org/10.9752/MS046.04-2012>.
- Becot F, et al.** (2014) Institutional demand for locally-grown food in Vermont: marketing implications for producers and distributors. *Journal of Food Distribution Research* **45**(2), 99.
- Berti G and Mulligan C** (2016) Competitiveness of small farms and innovative food supply chains: the role of food hubs in creating sustainable regional and local food systems. *Sustainability* **8**(616), 1–31.
- Bloom JD and Hinrichs CC** (2017) The long reach of lean retailing: firm embeddedness and Wal-Mart's implementation of local produce sourcing in the US. *Environment and Planning A* **49**(1), 168–185.
- Buckley J, et al.** (2013) Social relationships and farm-to-institution initiatives: complexity and scale in local food systems. *Journal of Hunger & Environmental Nutrition* **8**, 397–412.
- Christensen J, et al.** (2017) Assessing market channel performance for Colorado fruit and vegetable producers. *Journal of Food Distribution Research* **48**(1), 61–67.
- Clark JK and Inwood SM** (2016) Scaling-up regional fruit and vegetable distribution: potential for adaptive change in the food system. *Agriculture and Human Values* **33**, 503–519.
- Cleveland DA, et al.** (2014) Local food hubs for alternative food systems: a case study from Santa Barbara County, California. *Journal of Rural Studies* **35**, 26–36.
- Colloredo-Mansfeld R, et al.** (2014) Communities, supermarkets, and local food: mapping connections and obstacles in food system work in North Carolina. *Human Organization* **73**(3), 247–257.
- Conner DS, et al.** (2011) Value chains for sustainable procurement in large school districts: fostering partnerships. *Journal of Agriculture, Food Systems, and Community Development* **1**(4), 55–68.
- Conner DS, et al.** (2014) The diverse values and motivations of Vermont farm to institution supply chain actors. *Journal of Agricultural and Environmental Ethics* **27**(5), 695–713.
- Conner DS, et al.** (2016) Value chains for sustainable procurement in large school districts: fostering partnerships. *Journal of Agriculture, Food Systems, and Community Development* **1**(4), 55–68.
- Diamond A and Barham J** (2011) Money and mission: moving food with value and values. *Journal of Agriculture, Food Systems, and Community Development* **1**(4), 101–117.
- Dimitri C and Greene C** (2000) Recent growth patterns in the US organic foods market. *Agriculture Information Bulletin-USA Economic Research Service* (777).
- Dimitri C, Hanson J and Oberholtzer L** (2012) Local food in Maryland schools: a real possibility or a wishful dream? *Journal of Food Distribution Research* **43**(2), 112–128.
- Dimitri C and Oberholtzer L** (2009) Marketing US organic foods: recent trends from farms to consumers. *Economic Information Bulletin-USA Economic Research Service*, (58).
- Dimitri C and Richman NJ** (2000) Organic foods markets in transition. Policy Studies Report, no. 14, Henry A. Wallace Center for Agriculture and Environmental Policy.
- Dunning R** (2016) Collaboration and commitment in a regional supermarket supply chain. *Journal of Agriculture, Food Systems, and Community Development* **6**(4), 21–39.

- Dunning R, Bloom JD and Creamer N** (2015) The local food movement, public-private partnerships, and food system resiliency. *Journal of Environmental Studies and Sciences* 5(4), 661–670.
- Farmer JR and Betz ME** (2016) Rebuilding local foods in appalachia: variables affecting distribution methods of West Virginia farms. *Journal of Rural Studies* 45, 34–42.
- Feenstra G, et al.** (2011) Using a supply chain analysis to assess the sustainability of farm-to-institution programs. *Journal of Agriculture, Food Systems, and Community Development* 1(4), 69–84.
- Feenstra G and Hardesty S** (2016) Values-based supply chains as a strategy for supporting small and mid-scale producers in the United States. *Agriculture* 6(39), 1–17.
- Fischer M, et al.** (2013) Findings of the 2013 National Food Hub Survey. Michigan State University Center for Regional Food Systems & The Wallace Center at Winrock International. Retrieved from <http://foodsystems.msu.edu/activities/food-hub-survey>.
- Greene C, et al.** (2017) Growing Organic Demand Provides High-Value Opportunities for Many Types of Producers. Amber Waves. US Department of Agriculture, Economic Research Service. <https://www.ers.usda.gov/amber-waves/2017/januaryfebruary/growing-organic-demand-provides-high-value-opportunities-for-many-types-of-producers/>. Retrieved October 19, 2017.
- Gupta C and Jablonski BB** (2016) Farm impacts of farm-to-grocer sales: the case of Hawai'i. *Journal of Food Distribution Research* 47(3), 61–83.
- Hardesty S, et al.** (2014) Values-based supply chains: supporting regional food and farms. *Economic Development Quarterly* 28(1), 17–27.
- Hardy J, et al.** (2016) *Findings of the 2015 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/resources/2015-food-hub-survey>.
- Hingley M and Vilalta-Perdomo EL** (2017) Roles of intermediaries in developing resilient systems: A community approach to food micro-producers. In *Global Intermediation and Logistics Service Providers*. Hershey, PA: IGI Global, pp. 43–63.
- Kim MK, Curtis KR and Yeager I** (2014) An assessment of market strategies for small-scale produce growers. *International Food and Agribusiness Management Review* 17(3), 187–204.
- Kirschenmann F, et al.** (2008) Why worry about the agriculture of the middle. In Lyson TA, Stevenson GW and Welsh R (eds). *Food and the mid-Level Farm: Renewing an Agriculture of the Middle*. Cambridge, MA: MIT Press, pp. 3–22.
- Knigge L, Brimlow JN and Metcalf SS** (2016) Food hubs: Connecting farms with local and regional markets. In: Gattrell J., Jensen R., Patterson M., Hoalst-Pullen N. (eds). *Urban Sustainability: Policy and Praxis, Geotechnologies and the Environment*, vol 14. Cham: Springer, pp. 169–184.
- Krejci CC and Beamon BM** (2014) Assessing Regional Farm-to-Institution Food Distribution Systems: An Agent-Based Approach. Proceedings of the 2014 Industrial and Systems Engineering Research Conference. Abstract: I1303, pp 3592–3601.
- Krejci CC, et al.** (2016) Analysis of food Hub commerce and participation using agent-based modeling: integrating financial and social drivers. *Human Factors* 58(1), 58–79.
- LeBlanc JR, et al.** (2014) Building resilience in nonprofit food hubs. *Journal of Agriculture, Food Systems, and Community Development* 4(3), 1–15.
- Low SA, et al.** (2015) *Trends in U.S. Local and Regional Food Systems: A Report to Congress*. Economic Research Service, US Department of Agriculture.
- Low SA and Vogel S** (2011) *Direct and Intermediated Marketing of Local Foods in the United States*. Washington, DC: U.S. Department of Agriculture, Economic Research Service. ERR-128.
- Matson J and Thayer J** (2013) The role of food hubs in food supply chains. *Journal of Agriculture, Food Systems, and Community Development* 3(4), 43–47.
- National Sustainable Agriculture Coalition (NSAC)** (2015) Got local food? New report highlights trends. February 5. Retrieved November 2017 from <http://sustainableagriculture.net/blog/local-food-trends-report/>.
- Oberholtzer L, Dimitri C and Jaenicke EC** (2014) Examining US food retailers' decisions to procure local and organic produce from farmer direct-to-retail supply chains. *Journal of Food Products Marketing* 20(4), 345–361.
- Richards TJ, et al.** (2017) Retail intermediation and local foods. *American Journal of Agricultural Economics* 99(3), 637–659.
- Richman N** (2016) *Getting It There: Understanding the Role of New England Food Distributors in Providing Local Food to Institutions*. Farm to Institution New England. 24 pp.
- Rimal A, et al.** (2016) Farm income and food hub participation: farmer attributes, attitudes and perceptions. *Journal of Food Distribution Research* 47(1).
- Ringquist J, et al.** (2016) Capitalizing on the shifting consumer food value equation. Deloitte. Retrieved November 2017 from <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-fmi-gma-report.pdf>.
- Schmit TM and LeRoux MN** (2014) Marketing Channel Assessment Tool (MCAT) Benchmark Performance Metrics. Cornell University. EB 2014-13. Retrieved November 2017 from <http://publications.dyson.cornell.edu/outreach/extensionpdf/2014/Cornell-Dyson-eb1413.pdf>.
- Severson RM and Schmit TM** (2015) *Building Success of Food Hubs Through the Cooperative Experience: A Case Study Perspective*. Ithaca, NY: Charles H. Dyson School of Applied Economics and Management, College of Agriculture and Life Sciences, Cornell University.
- Stephenson GW, et al.** (2011) Midscale food value chains: an introduction. *Journal of Agriculture, Food Systems, and Community Development* 1(4), 27–34.
- Stephenson GO, Lev L and Brewer LJ** (2006) When things don't work: some insights into why farmers' markets close. Special report 1073. [Corvallis, Or.]: Oregon State University, Extension Service.
- U.S. Department of Agriculture, Economic Research Service (USDA-ERS)** (2017) Agricultural Act of 2014: Highlights and Implications. Local Foods. Retrieved November 2017 from <https://www.ers.usda.gov/agricultural-act-of-2014-highlights-and-implications/local-and-regional-foods/>.
- U.S. Department of Agriculture, Food and Nutrition Service (USDA-FNS)** (2017) Data Catalog. Farm to School Census. Retrieved March 3, 2018 from <https://catalog.data.gov/dataset/farm-to-school-census-2013>.
- U.S. Department of Agriculture, Food and Nutrition Service (USDA-FNS)** (2016) About the Census. 2015 Farm to School Census. Retrieved November 2017 from <https://farmtoschoolcensus.fns.usda.gov/about>.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (1999) 1997 Census of Agriculture. Retrieved November 2017 from http://agcensus.mannlib.cornell.edu/AgCensus/getVolumeOnePart.do?year=1997&part_id=949&number=51&title=United%20States.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2004) 2002 Census of Agriculture. Retrieved November 2017 from http://agcensus.mannlib.cornell.edu/AgCensus/getVolumeOnePart.do?year=2002&part_id=1017&number=51&title=United%20States.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2009) 2007 Census of Agriculture. Retrieved November 2017 from https://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1_Chapter_1_US/usv1.pdf.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2010) 2008 Organic Production Survey (2007 Census of Agriculture Special Study). Retrieved November 2017 from https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Organic_Production/index.php.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2012) 2011 Certified Organic Production Survey. Retrieved November 2017 from https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Organic_Production/index.php.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2014a) Farmers marketing. 2012 Census of Agriculture. ACH12-7. August. Retrieved November 2017 from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farmers_Marketing/Highlights_Farmers_Marketing.pdf.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2014b) 2012 Census of Agriculture. Retrieved November 2017 from https://www.agcensus.usda.gov/Publications/2012/#full_report.
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS)** (2015) 2014 Organic Survey (2012 Census of Agriculture Special Study). Retrieved November 2017 from https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Organic_Production/index.php.

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS) (2016a) 2012 Census of Agriculture Highlights. Direct Farm Sales of Food. Results from the 2015 Local Food Marketing Practices Survey. ACH12-35. December. Retrieved March 3, 2018 from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Local_Food/LocalFoodsMarketingPractices_Highlights.pdf.

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA-NASS) (2016b) Certified Organic Survey. 2015 Summary. Retrieved November 2017 from https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Organic_Production/index.php.

Woods T, et al. (2013) Local food systems markets and supply chains. *Choices* (new York, NY) **28**(4), 1–4.