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Sustainable School Food Procurement in Large K–12 Districts: Prospects for Value Chain Partnerships

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Many scholars and activists are interested in the potential for school-based childhood nutrition programs to positively impact the U.S. agri-food system. This paper explores efforts of a national K–12 school food collaborative to procure more sustainably grown and healthful food products. After a review of literature on transaction cost theory and school food procurement, the paper examines the potential of strategic partnerships in a value chain framework to meet procurement change goals. Results from a qualitative study of two participating school districts suggest that partnerships can offer potential solutions to recurring procurement barriers found in previous research.

Key Words: school meals, supply chains, transaction costs

Many scholars and activists are interested in the potential for school-based childhood nutrition programs to positively impact the U.S. agri-food system. Interest in school food is rooted in the dual objectives of the National School Lunch Program (NSLP) and other school-based childhood nutrition programs: (i) to provide adequate nutrition for children, and (ii) to support markets for U.S. farm products (Ralston et al. 2008). These programs are a vital source of nutrition for U.S. children, particularly low-income children. Given the government's expenditure on school food—\$13.8 billion in fiscal year 2010 (USDA 2009)—sales to schools can potentially be an important market for farmers. Furthermore, these goals align with USDA's recently launched "Know Your Farmer, Know Your Food" (KYF) initiative, which aims to create linkages between local consumers and local producers (USDA 2010).

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Funding for this project was supplied by the W.K. Kellogg Foundation.

This paper discusses efforts of a national K–12 school food collaborative to achieve more sustainable and healthy procurement practices. It is an exploratory study specifically focusing on two districts engaged in intensive efforts to investigate and share strategies for change. The next section will review selected literature on transaction cost theory and supply chain models. Then we examine an emerging model in agri-food studies—the values-based supply chain or value chain—by contrasting it with the conventional supply chain model. We then discuss ongoing barriers in school food procurement and the potential of value chains to address them.

Selected Literature

Supply Chain Models

Numerous studies discuss the role of supply chain partnerships in guiding firms' procurement decisions. Transaction cost economics suggests three principal models for procurement (Dyer 2000, Hobbs 1996, Ritter 2007). At one end of a continuum is vertical integration or hierarchy, where a firm produces its needed inputs in-house, or otherwise exerts a great deal of control over the process. At the other end of the continuum is the use of arm's-length spot markets, where the firm

shops for the best price each time it purchases inputs. In the middle of this continuum is a range of possible means of coordinating economic activity, including partnerships, where the firm buys from a limited number of preferred suppliers and builds long-term strategic relationships with them.

The literature on transaction costs and economics suggests circumstances when each model will prevail (Dyer 2000, Hobbs 1996, Kumar 1996). The vertical-hierarchy model is called for when inputs are of high differentiation or quality, and/or when the means to deliver them are highly specialized; control over inputs is needed to ensure quality and ensure repeat use of specialized infrastructure. Spot markets are used for frequent and highly routinized transactions of homogeneous or low quality inputs. The same input is available from many places, so the buyer can simply choose the one with the lowest cost.

Strategic partnerships occupy a middle ground in this continuum. Partnerships are best used when vertical-hierarchical arrangements are too slow to adapt and innovate, but arm's-length suppliers are not willing to invest in equipment or share information needed to achieve needed innovation (Dyer 2000, Kumar 1996). Dyer (2000) discusses several trends that favor relationships over the other two options, including advances in information technology, increased product complexity, and demand for customized products. Ritter (2007) presents a set of criteria that evaluate a firm's business relations with a given supplier or buyer. Relations described as hierarchical or vertically integrated are governed by rules and unequal market power, whereas relations described as spot markets are anonymous and driven by price. Relations described as partnerships, on the other hand, are cooperative, driven by synergy, mutually dependent, and divide labor and benefits in ways that are agreed upon mutually.

Value Chains

The value chain model, developed by Porter (1985) and recently adapted for agri-food studies, incorporates many of the supply chain partnership model key principles. This model builds on work by scholars who have investigated the potential of "alternative" or "values-based" food supply chains to access broad market channels while retaining the connection between farmer and consumer. This

model may provide a platform for distributing products with embedded attributes such as local, sustainable, natural, and healthful, to non-direct market outlets (Kirschenmann et al. 2008). As shown below, value chains share many characteristics with supply chain partnerships, but are distinguished by a set of shared values and desire to cooperate in order to achieve a set of broad goals around sustainability and food quality (Bloom and Hinrichs 2010, Sage 2003, Renting, Marsden, and Banks 2003, Stevenson 2009).

Key characteristics of value chains as outlined by Stevenson and Pirog (2008) include the following:

- product differentiation and value-added products
- strategic partnerships across supply chain actors
- information-sharing
- trust
- commitment to welfare of all participants through fair pricing
- fair governance.

For the purpose of this paper, we posit several attitudes and behaviors as indicators of value chain partnerships. We emphasize two caveats. First, the distinction between value chain partnerships and other supply chain actors' behaviors should be seen as ideal types (Patton 2002) intended to illustrate key differences rather than definitively distinguishable categories: they are ends of a spectrum with most behaviors lying in between. Our analysis must therefore focus on the degree to which actors' behaviors are indicative of value chain partnerships within a large gray area rather than a simple binary black/white comparison. Second, the categories discussed below and in Table 1 are not mutually exclusive: a given attitude or behavior could reasonably fit into more than one category. Indeed, the activities are integrated in ways such that they are mutually reinforcing (e.g., co-learning increases trust, leading to more equitable pricing, closer collaboration, and greater regard). Indicators of value chain partnerships follow.

- *Relationships of mutual regard based on shared values.* Value chain actors share values (Stevenson 2009, George 2011, Sage 2003) and use their business to collaboratively achieve goals related to these values, such as support for local farms and high quality, nutritious food. They preferen-

Table 1. Key Attributes of Values-Based Value Chains and Conventional Supply Chains

Attribute	Values-Based	Conventional
Business relationships	Win-win relationships of regard constructed on collaborative principles and shared values	Win-lose, adversarial and competitive, arm's-length, interchangeable
Pricing	Equitable sharing, emphasis on long-term prosperity; value from product differentiation	Short-term profits, benefits accruing mainly to retailers and input suppliers. Buy-sell transactions of commoditized items
Information and learning	Co-learning, trust information exchange for mutual benefit	Proprietary information

tially buy or sell to incumbent partners (Dyer 2000) and may offer technical assistance to help preferred partners meet food safety or packaging specifications (Falat 2011).

- *Fair, stable pricing of differentiated products.* Value chain partners favor fair, stable, and transparent pricing so as to foster long-term relationships, in some cases sharing production costs with partners and negotiating cost-plus pricing policies (Falat 2011, Stevenson 2009). Pricing is supported by differentiation strategies that create value for customers by offering unique product attributes (Stevenson 2009) and increasing grower control down the supply chain.
- *Co-learning, trust, and communication.* Value chain partners invest in the relationships with partners by paying personal visits to suppliers' farms or plants, and sharing information to facilitate transactions (Dyer 2000, Falat 2011, Hammervoll and Toften 2010, Hobbs 1996). Trust may be signaled by investment in assets specific to the partnership (Dyer 2000).

School Food Procurement

Closer ties between farmers and students have the potential to better achieve NSLP's nutrition and market support goals and make the food more valu-

able or desirable to consumers (Conner, Campbell-Arvai, and Hamm 2008, Stevenson and Pirog 2008, Meter, n.d.). Creating these connections is more easily accomplished in short supply chains, particularly farm-direct, when farmers themselves deliver food directly to schools (Renting, Marsden, and Banks 2003). However, farm-direct purchasing departs substantially from the dominant school food purchasing practices favoring the streamlined services of broad line distributors (those that offer a full line of food, paper, and other products) rather than purchasing farm-direct or from distributors who specialize in local food products (Izumi, Wright, and Hamm 2009). Initiating successful relationships with farmers is particularly difficult for school districts with highly routinized and mechanized food production facilities and practices that do not readily incorporate seasonal menus or accommodate whole or minimally processed foods (Kloppenburger, Wubben, and Grunes 2008). Such barriers are all the more entrenched in large school districts—those serving more than 40,000 students—where the required food volumes can pose particularly acute obstacles to farm-direct purchasing (Berkenkamp 2006).

As a result of these and other challenges, school districts have increasingly relied upon intermediaries to deliver locally grown food (Izumi, Wright, and Hamm 2009). This, in turn, may pose a conflict with efforts to maintain the food's identity as well as threatening goals such as increasing farmers' share of the food dollar and creating stable markets for their products. The challenge, particularly for large school districts' food service operations, is to create supply chains that can reliably deliver adequate quantities of food with the desired specifications (e.g., chopped lettuce, shredded lettuce, or whole lettuce), retain the farmers' identity and connection to consumers, and enhance farm viability at various scales of production. In other words, some advocates have questioned the degree to which school programs can reconnect producers and consumers when foods travel through long and complex commodity supply chains (Ohmart and Markley 2007).

"Farm to school" (FTS) is perhaps the most well-known effort to harness the potential of school food to improve the agri-food system. Conceptually, FTS efforts connect schools with local and regional farmers for mutual benefit: farmers gain access to a new market opportunity and schools

gain access to a nearby source of fresh food (Valianatos, Gottlieb, and Hasse 2004). Both FTS and KYF have the intention of creating closer connections and decreasing the distance (both geographic and social) between farmers and consumers, thereby bringing an array of purported social, economic, environmental, public health, and nutrition benefits (Bagdonis, Hinrichs, and Schafft 2009, Schafft, Hinrichs, and Bloom 2010, USDA 2010).

Application of Supply Chain Partnerships to Schools' Sustainable Procurement Goals

As federally funded nutrition programs, schools are required to conform to strict competitive bidding processes; they may also face state and municipal regulations, which vary among states and district—adding to the complexity. Schools use bidding processes to ensure lowest costs, with specifications to prescribe the desired product attribute, creating a set of prime vendors who provide the majority of foods purchased. Bids most closely resemble spot markets in that price is the sole determinant in the transaction, once desired specifications have been met (Hobbs 1996). In a true spot market all other terms are non-negotiable: the buyer simply accepts or rejects the product as is. Specifications are a means of negotiating product quality, formulation, and attributes, as well as delivery and other logistics.

Pure spot markets are problematic for schools since they would deliver the lowest-priced goods but make procurement of healthful, sustainable, and regionally grown foods difficult. Items in highly commoditized spot markets (e.g., milk or wheat flour) are typically pooled from many different farms, making the story and face of the farmer difficult or impossible to identify. Schools could theoretically create very tight specifications on a product (e.g., produced in the school's home county, containing only natural or healthful ingredients) and find no vendor willing or able to supply, or only at prohibitively high cost. On the other hand, vertical integration is problematic as well. Schools rely on supply chain actors to grow, process, and distribute food because they lack capacity to do so themselves (Conner et al. 2011). Taking on these services in-house would lie outside the management capacity of school districts. Most school districts, even large ones, may lack

sufficient volume to operate ancillary businesses at a cost-effective scale.

Value chain partnerships may help schools meet procurement goals, but have limits as well. George's (2011) study of a large school district's local procurement program finds that much of the success in creating strong partnerships lay in the school's enthusiastic commitment and shared embedded values among supply chain actors. As in Falat's (2011) study, information flow and transparency often became a challenge in supply chains where a large number of actors were included. The role of distributors as gatekeepers of information was affirmed. George (2011) also predicts difficulty for schools in adopting value chain partnerships due to price and budgetary constraints, which are believed to be greater than those of other institutions or food service operations.

There are several reasons why schools' value chains may differ from those studied by Stevenson (2009) and European scholars. These cases involve sales to retailers or restaurants (Stevenson 2009, Renting, Marsden, and Banks 2003), which do not face the extreme budget constraints of publicly funded institutions such as school food service. Furthermore, many identified examples were initiated by and for farmers, using a "supply push" approach: farmers and their allies create partnerships with supply chain actors such as processors, distributors, retailers, or restaurants to "push" differentiated, high quality food products into broad market channels (Marsden, Banks, and Bristow 2000, Stevenson 2009). In contrast, a "demand pull" approach would be initiated by consumers or retail/institutional buyers, who would use their buying power to pull foods with desired attributes to them (Martinez and Stewart 2003).

Sustainable Procurement in Large School Districts

Recently, many large school districts have begun working together in the School Food FOCUS (SFF) collaborative to address the challenge of procuring more healthful, regionally sourced, and sustainably grown foods, in the required form and quantity. SFF focuses on developing food procurement practices that

- prioritize whole and minimally processed foods
- promote more locally and regionally focused

food production, processing, and distribution systems

- enhance and sustain the economic, environmental, and social systems of the communities in which these food systems are embedded (One Tray Team 2009).

SFF is distinct from FTS food programs. While many FTS efforts focus on fresh produce (Bagdonis, Hinrichs, and Schafft 2009, Berkenkamp 2006), SFF is addressing all food groups on the plate, including the meat/meat alternative entrée, dairy, and grains. Scale and transaction costs may limit the ability of the farm-direct model to adequately supply school food service operations with various products. Therefore, a broader perspective including processors and distributors is needed.

This paper discusses the efforts of two large public K–12 school districts to procure more healthful, regionally sourced, and sustainably grown foods into their school meals program. The two school districts, Saint Paul (Minnesota) Public Schools (SPPS) and Denver (Colorado) Public Schools (DPS), were the first two districts to participate in the School Food Learning Lab (SFL), an SFF program. Our highly exploratory research comprises one of the first documented examples of large K–12 school districts employing a demand pull approach to create partnerships with supply chain actors to achieve the goal of procuring foods with desired attributes. It investigates the following question: To what extent can value chain partnerships contribute to sustainable school procurement goals? Specifically, to what extent do elements of these partnerships arise and what role do they play in helping the schools meet their goals?

After outlining the methods used in this study, we provide short descriptions of each case, focusing on the changes desired by each school district and efforts to accomplish these goals through value chain development. We then investigate whether and to what extent the key components of value chains outlined above are present in the school districts' transactions. These findings are then discussed within the context of prior research on FTS and value chain/supply chain partnerships, in order to identify the prospects for contributions toward sustainable school food procurement.

Methods

The SFL team was comprised of three individuals—the SFL manager working for FOCUS and two researchers from Michigan State University (MSU)—with protocols approved under the MSU Institutional Review Board. Work began with SPPS and DPS in October 2008 and May 2009, respectively. The school teams consisted of food service professionals and one or more community partners who shared ideas, contacts, and other resources, and who served as liaisons between the SFL team and supply chain actors. Each school team developed a list of four to five priority food items for which they wanted changes that represented a fairly significant portion of the food budgets. Based on discussion with the school team to better understand its current and desired procurement practices, the SFL and school teams collaboratively developed a series of research questions, with the goal that answers would guide sound procurement decisions in support of the desired changes. The school team also assisted in purposive interview sampling among current and prospective product vendors, and stakeholders in local, state, and federal government. The SFL team visited each school district three times and conducted 17 key informant interviews (Patton 2002) in Minnesota and 26 in Colorado. Many of these interviews were with government officials, members of industry groups, or vendors who lacked the desired products, logistics, capacity, or other factors needed to supply the schools; these interviews are not discussed in detail here. This paper focuses on 13 participants from four supply chains: a produce supply chain for each school district, a chicken supply chain vendor, and a beef supply chain (Table 2). The actions, outcomes, and implications of procurement efforts in other priority areas (e.g., milk and bread) are discussed elsewhere (Abate et al. 2009a, Abate et al. 2009b).

The interviews were semi-structured (Wengraf 2001): the researchers had prepared a set of questions for each interviewee, vetted by the school teams, yet diverged from them as new issues emerged. Questions were open-ended (Patton 2002). In most cases, due to the sensitivity of the interview topic (i.e., a multi-thousand or even multi-million dollar food service contract at stake), interviews were not recorded to ensure a greater

Table 2. Key Informants in Minnesota and Colorado School Food Supply Chains

	Identifier	Description
MP1	Minnesota produce vendor 1	One of two vendors currently supplying SPPS
MP2	Minnesota produce vendor 2	One of two vendors currently supplying SPPS
MP3	Minnesota produce vendor 3	A produce distributor not currently supplying SPPS
MF1	Minnesota farmer 1	A mid-scale diversified farm who sold grape tomatoes, sweet corn, watermelons, and cantaloupes to SPPS via MPV1
MF2	Minnesota farmer 2	A mid-scale diversified farm who sold grapes, onions, butternut squash, and cucumbers to SPPS via MPV1
MC	Minnesota chicken	A vertically integrated chicken vendor
MT	Minnesota turkey	A vertically integrated turkey vendor
CB	Colorado broad line distributor	DPPS current contracted produce vendor and broad line distributor
CP	Colorado produce vendor	A produce processor and distributor who provides processed vegetables to CB and other accounts
CF1	Colorado farmer 1	Mid-scale diversified farmer who sold melons and squashes to DPS via CB
CF2	Colorado farmer 2	Mid-scale diversified farmer who sold peppers and cucumbers to DPS via CB
CM	Colorado meat processor	A rancher, processor, and retailer who specialized in locally produced meats from small and medium ranches
CQP	Colorado quick-chill processor	A quick-chill processor who makes sauces, soups, bean products, and other processed goods for food service operations

comfort level on the part of the research subject. At each interview, each SFL team member took extensive notes. Interview notes were then compiled by the SFL manager into a single memo, which was shared with the school teams. Initial impressions and observations were shared at debriefing meetings at the end of each visit. Opportunities for procurement changes were discussed among the teams, action steps planned and taken, and progress monitored. Furthermore, six supply chain actors (MP1, CB, CP, CF1, CM, and CQP) were interviewed in July and August 2011 and asked about their experiences during the 2010–2011 school year in order to monitor the changes that had been put in place. The remaining actors in Table 2 were contacted but either did not respond or declined to be interviewed again.

The notes from the interviews were then analyzed by the lead author of this paper. At first, the notes from each interview were categorized into factors that create opportunity or barriers to attaining the school districts' procurement goals. Two key, interrelated themes emerging from this analysis were the importance of school districts' relationships with vendors and the ability of districts to work with vendors as partners to solve problems and overcome barriers. These themes then served as a framework for a second analysis, in which codes were created, codes that were based on aforementioned dimensions of strategic value chain partnerships: shared values and regard, equitable pricing, and co-learning information exchange. As discussed in Miles and Huberman (1994), these codes were created to tie the

data to specific research questions and objectives, namely to investigate the degree to which these interviewees' expressed attitudes and behaviors resemble those found in previous studies to be indicative of strategic value chain partnerships (Table 1). Sub-codes were created based on indicators and counter-indicators of these dimensions: for example, under shared values and regard, indicators include attitudes such as expressed support for local farms and contributions to childhood nutrition, and behaviors such as buying from incumbents and offering technical assistance. Counter-indicators within these dimensions include attitudes such as primary concern for profit and arm's-length relationships, and behaviors such as one-time purchases based largely on price. A total of nine indicators and seven counter-indicators under the three dimensions were identified. The data—notes from key informant interviews detailing supply chain actors' self-reported attitudes and behaviors—were then manually coded. Comparisons were also made within and across individual respondents to determine the degree to which respondents exhibited attitudes indicative of strategic value chain partnerships and ways in which attitudes were linked to behaviors. These results, as well as an overview of each school district and its experiences in the SFL, are presented below.

Results

Overview of the Two School Districts' Desired Changes and Accomplishments

This section begins with a brief overview of the school districts and their food service operations' efforts to apply value chain principles to their procurement practices.

Saint Paul Public Schools (SPPS). School meals at SPPS are served by Nutrition and Commercial Services, a self-operated division of the school district. SPPS has an enrollment of about 38,000 students, 70 percent of whom are eligible for free and reduced-price meals. In 2009–2010, it served, on average, about 16,000 breakfasts and 29,000 lunches per day, with food preparation in a central commissary and meals delivered to 56 locations. Two of the priority food items and goals identified by SPPS are discussed in this paper: to increase procurement of locally grown fresh pro-

duce and poultry. In each case, SPPS attempted to use a demand pull approach to change supplier behavior in order to meet the goals.

Discussions with both current produce vendors revealed that they currently source from Minnesota farms in season but do not identify local produce as local or by farm origin to buyers. A group of farmers and the state produce industry group discussed the farmers' desire for consistently fair prices and greater transparency in the process. Based on this information, the SFL team created a request for proposals (RFP) for 13 local produce items. This RFP asked for vegetables in specific form (sliced, peeled) and asked the processor to specify delivery period, quantity, packaging, as well as farmer name (for education and marketing efforts) and price paid to the farmer. The RFP was drafted and then revised to ensure its feasibility for all parties before reaching final form. One of the current vendors, MP1, bid the lowest prices for all items. SPPS purchased 173,000 pounds of local produce, 14 items sourced from six farmers within a 100-mile radius, paying about \$130,000. This represents about 40 percent of total produce purchases during this time period (August to December). While SPPS had likely been purchasing local produce from these vendors in past years, the exact quantity is not known. Information about supplying farms was used in SPPS's marketing efforts to raise awareness of the role of Minnesota farmers in the district's Commercial and Nutrition Services. The RFP process was expanded for the 2010–2011 school year, with purchases of about 225,000 pounds of local produce.

To approach their second food purchase target, the SFL team interviewed two Minnesota-based poultry processors, both vertically integrated firms that contract with local farmers. However, one (MC) provided only raw product and was unacceptable, as SPPS lacked the handling protocols for raw poultry at that time. MT, a subsidiary of a large agribusiness corporation, was already participating in the USDA commodity program. In the second interview with MC, it was discovered that MC had a surplus of dark meat and was willing to create consistent portion sizes and appropriate quantities. SPPS agreed to develop handling protocols for raw poultry; the protocols were pilot-tested and implemented at one SPPS school in March 2010. The children's reaction was overwhelmingly positive, with no reported leftovers. SPPS continued purchases for the 2010–2011 year.

Denver Public Schools (DPS). School meals at DPS are served by Nutrition Services, a self-operated division of the school district. DPS has a student enrollment of about 73,000, 66 percent of whom are eligible for free and reduced-price meals. DPS serves about 14,000 breakfasts and 39,000 lunches per day. Food is prepared at various kitchens throughout the district and delivered to 156 schools. DPS' priority items focused on increasing procurement of a range of locally produced foods, including produce, meats, cheese, and processed foods. In each case, the school attempted to use its buying power to change vendors' practices in ways that met procurement goals.

To increase procurement of local produce, DPS sought to work with its current broad line distributor, CB. At the request of DPS, CB began to track existing Colorado-grown produce purchases (via a separate local code for each Colorado-grown item in the ordering program) and listed the farm name on the ordering screen. DPS purchased produce from CP, coordinating availability information and menu planning to use Colorado grown spinach, cubed squash, and root vegetables for roasting. Total local produce purchases during the 2010–2011 school year were 380,223 pounds, at a cost of \$304,773. Produce purchased included apples, spinach, butternut squash, cabbage, potatoes, onions, peaches, pears, plums, cantaloupe, and watermelon.

To effect procurement of local meat and processed foods, SFL met with CQP, a quick-chill processor, in June 2009, and subsequently arranged for another meeting in October 2009, this time including DPS staff. At that time, the processor was receiving commodity ground beef and creating taco meat and crumbles for another Colorado school district. Separately, the SFL team met with an independent meat processor and retailer, CM, whose operation was dedicated to creating opportunity for small- and mid-scale ranchers. CM had a surplus of ground beef at a competitive price. DPS arranged for CQP to receive, cook (into desired form, such as burger patties and ground beef crumbles), cool, and ship the product to DPS. As a result, from September 2010 to May 2011, DPS bought 137,010 pounds of local beef from CM, at a cost of about \$349,000.

Overall, both school districts were able to meet their procurement goals without sacrificing par-

ticipation rates or economic viability. SPSS experienced no significant change in the percent of enrolled students who participate in the school meal program, while DPS experienced a slight increase. Furthermore, school food professionals in each district repeatedly mentioned the need to stay within prescribed budgets by adjusting the mix of more and less expensive purchases as part of their overall menu development and procurement strategies.

We now present results from the interviews with supply chain actors (Table 2), addressing the following questions: To what extent do the school food supply chain partnerships resemble value chains? Specifically, is there evidence of shared values that underpin and shape their business relationships? Is equitable sharing of risk and reward reflected in pricing practices? Is there information exchange and co-learning among partners that creates mutual value?

Business Relationships and Values

Interviewees were asked about their businesses' interest in the school food market, their potential contribution to the school districts' food goals such as improved local farm viability and childhood nutrition, and the importance of these goals to their businesses. Supply chain actors in both cities commonly expressed a desire to support local farmers and businesses; concern for childhood nutrition was less commonly expressed. All produce vendors (MP1, MP2, CB, and CP) had generally positive attitudes about supporting local farmers and the local economy, although CB cautioned that local produce may not meet its quality standards (due to a lack of in-field chilling equipment, for example), and the small scale of Colorado farmers (compared to California) can "cause a headache" because a single untimely weather event can destroy an entire crop. MP1 says he "always buys from Minnesota farmers" when produce is in season; CB favors "supporting those around me," understanding that farmers eat in restaurants and buy his produce to re-sell in their farm stands, so it "comes around" (i.e., brings business back to him).

MP1, MP2, and CP state that they buy local produce almost exclusively from farmers rather than through brokers or other intermediaries. None of the vendors use any kind of written contract or

formal agreement: “handshake” agreements and spot market transactions seem to be the norm. These three produce vendors state that they work with farmers they have known for many years, those with whom they have long-term relationships. During a tour of CP’s facilities, the coolers were filled with numerous kinds of Colorado produce and the owner was able to easily name the farm from which each item came. MF1, a farmer who sold to SPPS via MP1, likes the idea that SPPS knows which farmers grew the produce and that SPPS is interested in seeing that the vendor was paid a fair price. CB will continue to buy from farmers with whom he has relationships (“loyal to our vendors”), as long as quality is adequate and prices are reasonable: he will not drop someone “to save 50 cents a case.”

Both CF1 and CP expressed reluctance to undercut other supply chain actors, especially those to whom they sell. CP only sells items directly to schools that distributors like CB do not carry, so as not to compete directly. CF1 would sell direct to a school serviced by CB only with CB’s prior approval, saying he does not “do business like that.”

Yet there are limits to how much farmer support the vendors actually provide: MF1 said that buyers tend to be “overly optimistic” on volumes; the quantities they “intend” to buy usually end up being substantially less than the actual purchase. Quantity as well as price and quality risks are all borne by the farmer, he continued. CB expressed frustration that farmers overestimate availability dates, run out of supply, and then give him little time to purchase from California or other distant sources.

The Colorado beef supplier (CM) expressed a deep commitment to local farmers: he spoke of his role as a long-time activist for small farmers. He stated that his meat processing and distribution business was created in large part to create alternative outlets for small local farmers and ranchers.

Expressions of concern surrounding childhood nutrition also emerged from a few supply chain actors. The food processor, CQP, spoke of a need for efforts to help develop food curiosity and better eating habits in kids, such as different types of sauces, authentic flavors, different foods prepared in a variety of ways, student education, and student gardening. One produce vendor, MP1, expressed pride in contributing to childhood nutri-

tion: one reason he is willing to offer fresh produce to schools at a relatively low price is his belief in the benefits of healthy eating. He expressed his admiration for SPPS’s ability to get kids to eat a wide variety of produce items.

Some relationships among actors indicate traditional supply chain principles. MP2 said he refuses to “get too married to any one farmer,” treating them more as interchangeable parts. Poultry vendors’ description of relationships with and procurement from suppliers appears to be quite routinized, resembling the interchangeable parts of an undifferentiated commodity model common to conventional supply chain relationships. The poultry vendors described themselves as vertically integrated: these firms contract with farmers who operate “grow out” facilities on their farms. The poultry firms supply all major inputs, including chicks and feed, with farmers following a tightly prescribed routine to produce predictable and uniform birds, which are sent to the vendor’s facilities for slaughter, processing, packaging, and shipment.

Equity and Pricing

The supply chain actors’ experiences suggest that support for local farms and childhood nutrition is constrained by price and economic bottom lines. Nearly all vendors currently engaged with schools were acutely aware of the tight margins under which school food service operates, and saw offering “competitive” prices as fundamental to selling to schools. SPPS’s two current produce vendors, MP1 and MP2, engage in a price competition; SPPS shares the price sheets of the two vendors with each one and chooses the lowest bid. Another Minnesota produce vendor (MP3) noted how he strongly dislikes this practice and therefore refuses to do business with SPPS, preferring a “legitimate” bid system with longer-term service accounts. MP1 does not mind because he gets weekly price quotes from his growers and sets prices accordingly.

The primacy of price and the desire to extract maximum economic surplus from upstream or downstream supply chain links dominates at times. One produce vendor, CP, says he lets the farmer be the risk taker (rather than promising to buy given quantities at set prices); another (MP2) says, using green peppers as an example, that he buys

from any of five different growers, preferring to “keep options open.” MP1 did not want to reveal the prices he pays to farmers, saying that buyers need to trust him and can see by his low prices that he is not “screwing” them. “Farmers can be concerned about themselves,” he adds, saying that they will not sell to him if the price is unfair.

Pricing between the schools and vendors tends to follow prescribed formulas. One produce vendor (MP2) uses a fixed formula for each item, which accounts for its price, yield/loss in processing, volume, overhead, labor, and delivery costs. One produce vendor (MP3) charges a single predictable price to all customers (schools, chain stores, or restaurants), while others (MP1, MP2) will offer different customers different prices depending on volume, delivery arrangements, and strategic considerations (discussed in the next section). CB charges a standard distribution fee above the cost he pays. In contrast, CM experienced difficulties when his input costs increased dramatically and no longer reflected what was built into the initial locked-in set price.

Getting a good price was a key consideration for the farmers. The two farmers (MF1, MF2) who sold produce to SPPS via the RFP process said the vendor paid a “fair” and “nice” price, respectively. Both exhibit price-taking behavior, consistent with commodities rather than differentiated products; they accepted what the vendor offered based on the “market price,” although some negotiation was possible. These prices tend to change weekly, and fluctuate greatly both within and between seasons. Neither farmer uses advance contracts, relying mainly on unplanned sales to long-time buyers. CF1 states that he trusts his buyers to offer the market price, but will occasionally request a slightly higher price or offer a volume discount which the buyer can pass along or keep as profit.

There were efforts by nearly all supply chain actors to add value to products by promoting their local identity. Several supply chain actors collaborated with schools to create marketing materials like posters and brochures. For example, CB created mechanisms for identifying local products in its ordering procedures.

There was mixed interest in price transparency among both vendors and farmers. MP1 was very reluctant to discuss prices paid to farmers, fearing that those who do not understand the subtleties of

his business would accuse him of exploitation. One Minnesota farmer (MF2) supplying SPPS under the RFP refused to discuss prices at all, while the other (MF1) discussed prices when assured that MP1 had given the SFL permission to ask. CQP stated that he is willing to open his books and reveal his costs of operation, but only once a long-term relationship based on large quantities of business has been established; only two such CQP clients existed at the time of the interview. CB will openly reveal the processing, packaging, and delivery fees he charges per case, plus the profit he makes, making it possible to calculate the amount he paid the farmer. CP’s fixed fee per case permits a similar process.

Information and Co-Learning

There is evidence that information exchange and co-learning partnerships opened opportunities and improved supply chain responsiveness: when information is exchanged, supply and demand can be coordinated to solve mutual problems. Two produce vendors (MP1, MP2) discussed spring-time planning sessions with farmers to coordinate steady supply. SPPS and DPS were able to buy local chicken thighs and grass-fed ground beef through a local poultry company (MC) and small-scale meat processor (CM), respectively, because these are items of which the vendor has a surplus (is “long”). Other cuts of the animal carcass (chicken breasts, drumsticks, and wings; beef steaks and roasts) have much higher demand and are easier to sell, leaving a surplus of thighs and ground beef. It was the desire of schools to serve items not available through their regular vendors that led to the conversations with and purchases from other vendors.

Communication also led to farmer benefits. One (MF1) said the connection with the vendor selling to SPPS allowed him to sell beyond what was intended as a one-time transaction. MF1 had a surplus of sweet corn due to an unusually late first freeze, and was able to sell the surplus to SPPS. Farmers in both states, MF2 and CF2, explained that schools are an ideal market for #2 grade vegetables; butternut squash with a small crack in the peel are cosmetically unacceptable for retail but, once peeled and diced, are fine for food service. CF2 explained how understanding the schools’ quality and price requirements cre-

ated a market for products that otherwise would have likely been thrown away or left in the fields. CB stated that getting to know how DPS does business and vice versa has smoothed over many problems. DPS provides more lead time in its ordering and CB has learned how DPS creates menus. "Tell me your side of the business and I'll listen to you, we'll meet in the middle."

The interviewees also discussed the development and importance of trust. CF1 mentioned the trust he has with buyers, leading to greater flexibility in pricing and mutual benefit. The mutual trust and benefit in CM's sales to DPS led CM to invest \$200,000 in processing and cooling equipment, which has made his operation more efficient. He laments that schools lack the budget to serve his beef every day.

CQP claims that his business model is predicated on relationships with customers. He is too small to operate in (what he deems high-volume, low-quality) commodity markets. At first, he mistakenly believed that schools were interested only in low-quality "race to the bottom" foods; however, his conversations with DPS and a few other area school districts have allowed him to find the "sweet spot," an array of products and services that are affordable to schools. His first requirement is for the school food service staff to visit his business, to meet and talk, which he says leads to "smooth sailing." His goal is for his customers to become collaborators, so they can "get closer, to understand each other's needs and abilities." In contrast, he believes one-off purchases and bids are the least productive, "not conducive to getting better at what you do." Having close relationships brings benefits. School accounts require different kinds of attention. CQP does not have to send sales staff to market its products and therefore avoids being "in a long line with others." With the relationship established, CQP's administration deals with schools' administrations, saving the expense of marketing: "a good type of sales."

Discussion

The School Food Learning Lab of School Food FOCUS employed a demand pull approach in efforts to improve the quality of school meals by helping school food service professionals procure more healthful, regionally sourced, and sustaina-

bly grown foods. The results of attempts by two large school districts (SPPS and DPS) to change procurement practices, within the School Food Learning Lab, suggest that value chain partnerships can offer potential solutions to recurring barriers in farm-direct procurement that were found in previous research. For produce procurement, each school district utilizes distributors who interface with farmers and processors, and provide the logistical services that many prior studies have found challenging to schools. Yet through the RFP process, one of SPPS's distributors began documenting local purchases and providing SPPS with additional information. The force of their demand pull and willingness to work with supply chain partners created mechanisms to work through problems to the satisfaction (and at least some perceived benefit) of all parties.

As found in prior studies, a set of shared values, including a desire to support local farmers and (to a lesser extent) supply healthy foods, emerge in participants' willingness to engage in alternative agri-food supply chains (Izumi, Alaimo, and Hamm 2010, Conner, Campbell-Arvai, and Hamm 2008, Sage 2003); relationships among actors and regard for consumers are vital in their transactions. These relationships and concomitant information exchange provide markets for farmers' #2 grade produce, and their steady purchase pattern helps to provide a predictable flow of goods and opportunity to keep processing facilities flowing smoothly. Yet price provides a counterbalance: price competition was the deciding factor in the winner of SPPS's produce RFP process. In all, these chains show some of the characteristics of partnerships found in prior research (Dyer 2000, Falat 2011), but more closely resemble conventional chains in other ways.

The nature of relationships among supply chain actors was not entirely marked by mutual regard, often varying by the commodity in question. Fresh produce procurement—due in large part to its perishability, seasonality, and the unpredictability of weather—bears some resemblance to value chain principles, while still maintaining many elements of conventional supply chains. Distributors rely on incumbent farmers with whom they have long-term relationships (Dyer 2000). Produce vendors showed some regard for farmers in the aggregate yet pitted them against each other individually. Produce vendors engaged in "buy and

sell” (Falat 2011) transactions in order to ensure supply at low prices, rather than locked in negotiated fair prices, a result consistent with Bloom and Hinrichs’ (2010) study. Many actors expressed discomfort with the imposed price transparency. Finally, it is interesting to note that the two supply chain actors who expressed concern for and support of childhood nutrition goals, MP1 and CQP, were at the center of efforts most closely resembling previously studied value chains.

Poultry vendors are vertically integrated; these relationships are more commonly marked by the control by powerful corporations over small captive suppliers common to the industry (Hinrichs and Welsh 2003) than strategic partnerships among relative equals. There is some evidence of co-learning and trust (between DPS and both CB and CQP), and some evidence of trust-building mechanisms like asset investment (by CM) and face-to-face visits (insisted upon by CQP) identified in previous studies (Falat 2011, Dyer 2000). Actors expressed reluctance to undercut others (especially those they sell to), but this is probably explained better as a strategy to avoid making important customers angry than as a strategy that reflects collaborative principles of some sort.

There are a few factors that may explain the varying degrees to which these supply chain actors behaved in ways indicative to value chains. First, as discussed above, these indicators and counter-indicators are ideal types at the ends of a spectrum, with most real-world behaviors lying between these poles. The differences in behaviors would be subtle. Second, the primacy of price is influenced by the tight margins faced by schools in comparison to retailers and restaurants. Similarly, schools (with the help of the SFLL) initiated these partnerships: the goal was to use a demand pull approach to procure foods with desired attributes at prices and in terms that favor the schools. Other value chains in the literature (Marsden, Banks, and Bristow 2000, Stevenson 2009) were initiated by farmers and their allies and therefore had the goal of higher prices for farmers.

As one of the only documented examples of attempts by large K–12 school districts to create and study a value chain created by demand pull, the SFLL process provides an interesting test case and contribution to knowledge of these chains. Comparing the attributes of the supply chains in this study with those of value chains and traditional supply chains in Table 1, we find some de-

gree of shared values, collaborative partnerships, and information exchange. The supply chain actors were willing to collaborate to understand and meet the school districts’ procurement goals. In some cases, the changes were fairly easy, such as identifying the produce farm of origin and increasing the quantities and numbers of items purchased locally. Other cases required new partnerships (SPPS chicken and DPS beef) and development of new protocols by the schools, such as SPPS’ handling of raw poultry.

The area in which value chain principles were least evident was in pricing. Discussion of pricing was a touchy subject, with supply chain actors generally more comfortable with the status quo than a new kind of partnership, again echoing the Bloom and Hinrichs (2010) study. The reluctance to adopt the equitable, transparent pricing relationships found in value chain studies is understandable in lieu of the key differences discussed earlier: maturity of partnerships, demand pull orientation, and public procurement. The SFLL value chain partners existed only a few months, and changes were requested mainly for the benefit of the buyer rather than by mutual strategic decisions of all partners. Finally, school districts’ procurement is still, by necessity, driven primarily by price, as found in prior research (Bloom and Hinrichs 2010). While the districts, especially SPPS, expressed interest in price transparency and fairness for farmers, these priorities were secondary to goals of purchasing local and healthful food, and the schools had little or no ability to guarantee higher prices for farmers by paying a premium.

The strength of this research is its contribution to understanding how large school districts can partner with scholars and practitioners to increase the power and sustainability of their procurement. The research is limited to the short time frame and limited number of school districts (two) and food items under study. However, it suggests potential mechanisms to help school districts meet procurement goals that address provenance and sustainability. The heterogeneity of U.S. school districts and the complexity of food school procurement make generalizability of these results inadvisable. Except for produce, the research did not go beyond the vendors to producers of (for example) beef or poultry to understand their motivations and behaviors, or to understand how sales to schools impact their businesses.

Conclusions

This project provides insight into the potential of demand pull value chain partnerships in increasing K–12 school procurement of locally grown foods in ways that assist school districts to meet broad procurement and food service goals. However, while farmers expressed general happiness with the transactions, the relationship between farmers and distributors remains essentially unchanged, apparently by mutual decision. As the mechanisms are monitored, refined, and tested over the coming years, it will be important to better understand the relationships between farmers and vendors, particularly their respective market power, motivations, and perceived benefits and drawbacks of current (interchangeable parts) and proposed (strategic partnerships) orientation, to inform development of mutually beneficial mechanisms.

The results do suggest many fertile avenues of future research, particularly the need for better understanding of the relationship between farmers and vendors, how demand pull value chains equitably share risk and reward among all supply chain links that supply affordable food to schools, and how they evolve over time. Given the limited resources of School Food FOCUS, high demand for its services, and large interest in FTS nationally, strategies to replicate these efforts and share results effectively are also needed. The activities of the SFLL have provided some evidence of the potential for broad collaboration among schools and demand pull strategies. We hope to continue these inquiries, learn about similar efforts elsewhere, and collaborate to help school food programs achieve their public health and farm viability goals.

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