



Economic Impacts of Farm to School

Case Studies and Assessment Tools



September 2017

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Acknowledgments

The authors would like to thank CoBank and AgriBank for their generous support of this project through a grant to the National Farm to School Network, a project of Tides Center. We would also like to thank Florence Becot, Erin Croom, Jeff O'Hara, Ryan Pesch, and Dave Swenson for serving as peer reviewers of this report. Finally, we would like to acknowledge Laura Hormuth, Eliza Hudson, Amy Jacobs, Erin Smith, Ariel Bernstein, and Karen Davidson for assisting with data collection.

Report designed by Elizabeth Brown.

Cover photo: National Farm to School Network, Back cover photo: Jason Van Haverbeke

Christensen L.O., Jablonski B.B.R., Stephens L., Joshi, A. (2017), Economic Impacts of Farm to School: Case studies and assessment tools, National Farm to School Network.



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Executive Summary

Farm to school strives to strengthen the connection communities have with fresh, healthy food and local food producers by changing food purchasing and education practices at schools and early care and education settings. While it is believed that farm to school has positive regional economic impacts, there are limited studies available to support this. This report presents findings from surveys conducted with 26 producers in nine states, highlighting economic impact assessment findings from two case studies: Minneapolis Public Schools and the state of Georgia.

Economic Output Multiplier for Minneapolis Public Schools = 1.45*

Economic Multiplier for Georgia = 1.48*

*In line with previous farm to school economic assessments, but larger than the more traditional fruit and vegetable production sectors.

Employment Output Multiplier for Minneapolis Public Schools =1.96⁺

Employment Multiplier for Georgia =3.35⁺

⁺Larger than respective non-farm to school production sector.

The findings of these case studies provide new insight into the potential for farm to school procurement to positively impact local economies.

To frame this report and provide context to the case studies, the report begins with a review of previously conducted economic impact studies of farm to school local food procurement, highlighting inconsistencies in approach and rigor. Next, the researchers propose an approach for data collection and modeling that draws heavily upon the U.S. Department of Agriculture, Agricultural Marketing Service's (2016) "The Economics of Local Food Systems: A Toolkit to Guide Community Discussions, Assessments and Choices," and Schmit and Jablonski's (2017) "A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: A Systematic Approach." The methodology proposed in the report is intended to elaborate our understanding of how school districts procure local foods and how the structure of these supply chains change participating farms' inter-industry linkages, therein resulting in local economic impacts. For the two case studies, we use a standardized methodology based on IMPLAN to assess the local economic impact of school's local food purchases, which is also described in the report.

The preliminary results from the two case studies strengthen the call for farm to school stakeholders, with strong relationships to local producers, to use the methodology framed in this report to conduct additional assessments evaluating the economic impacts of farm to school procurement. Further assessment conducted with rigorous research protocols can fill an important gap in knowledge and open new opportunities for farm to school implementation and advocacy.

Glossary of Terms

Countervailing effects – countervailing effects (offsets) refer to the idea that gross gains in production of one good must be balanced against the fact that these shifts will usually cause shifts away from production of other goods.

Direct effect – changes associated with the industry in which a final demand change is made.

Economic impact - the net change in new economic activity associated with an industry, event, or policy in an existing regional economy.

Farm to school – programs, policies, or interventions intended to enrich the connection communities have with fresh, healthy food and local food producers by changing food purchasing and education practices at schools and early care and education settings. Farm to school implementation differs by location, but always includes one or more of the following three core elements of farm to school: (1) Procurement: Local foods are purchased, promoted, and served in the cafeteria or as a snack or taste-test; (2) Education: Students participate in education activities related to agriculture, food, health, or nutrition; and (3) School gardens: Students engage in hands-on learning through gardening. Farm to school empowers children and their families to make informed food choices while strengthening the local economy and contributing to vibrant communities.

Food hubs - a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.

Functional economic area – an area that covers a relatively contained and cohesive network of trade that includes the places where people live, work, and shop.

IMPLAN – a company that provides the most widely used proprietary data and software for economic impact assessments.

Indirect effect - changes in backward linked industry purchases as they respond to the new demands of the directly affected industries.

Induced effect – changes in spending from households as labor income is converted into household spending on local goods and services.

Input-output model – process regional, state, or national tables of inter-industrial transactions (linkages) to generate industry-specific multipliers.

Leakage – outflow of income, resources, or capital from a given economy.

Local purchasing percentage - the share of input purchases from local sources.

Margin – sales less costs of goods sold.

Multipliers – numeric way of describing the secondary impacts stemming for a change in the economy.

Opportunity cost – represents the relationship between scarcity and choice. It is the next best alternative or the opportunity forgone when making a choice.

Production function – where an industry spends, and in what proportions, to generate each dollar of output.

Shock – an event that affects an economy, either positively or negatively.

Universal school meals – schools offer breakfast and lunch at no charge to all students.

Introduction

Nearly 100,000 schools across the United States (U.S.) serve lunch to 30.5 million students each day through the National School Lunch Program,¹ which includes \$12.99 billion per year in federal dollars (SNA 2016). One of the central goals of farm to school is to extend market access for small and medium-sized farmers to this institutional market. According to the United States Department of Agriculture's (USDA) Farm to School Census, 5,254 districts or 42,587 schools (42% of all schools in the U.S.), participated in farm to school activities in the 2013-2014 school year, reaching 23.6 million children and incorporating almost \$800 million worth of local food products into schools (USDA FNS 2015).

Farm to school strives to strengthen the connection communities have with fresh, healthy food and local² food producers by changing food purchasing and education practices at schools and early care and education settings. Farm to school implementation differs by location, but always includes one or more of the following three core elements of farm to school (Figure 1): (1) procurement: local foods are purchased, promoted, and served in the cafeteria or as a snack or taste-test; (2) education: students participate in education activities related to agriculture, food, health, or nutrition; and (3) school gardens: students engage in hands-on learning through gardening. These elements are implemented with the intention of empowering children and their families to make informed food choices while strengthening the local economy and contributing to vibrant communities.

Authorized through the Healthy Hunger Free Kids Act of 2010, the USDA Farm to School Grant Program provides \$5 million per year in mandatory funding for supporting farm to school activities nationally. The grants fall into four categories: (1) planning; (2) implementation; (3) support services; and (4) training. While no more than 10% of the awarded grant funds may be used for food purchases, the grants facilitate and support the purchase of local foods by schools through providing resources to support trainings, equipment, labor and staff costs, and planning time needed to initiate or streamline local procurement options for schools. In addition, the 2014 Farm Bill provides financial support to local or state

Figure 1: Core Elements of Farm to School

Source: National Farm to School Network (2014).

CORE ELEMENTS OF **FARM to SCHOOL**



¹ The National School Lunch Program is a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches to children each school day (USDA FNS n.d.).

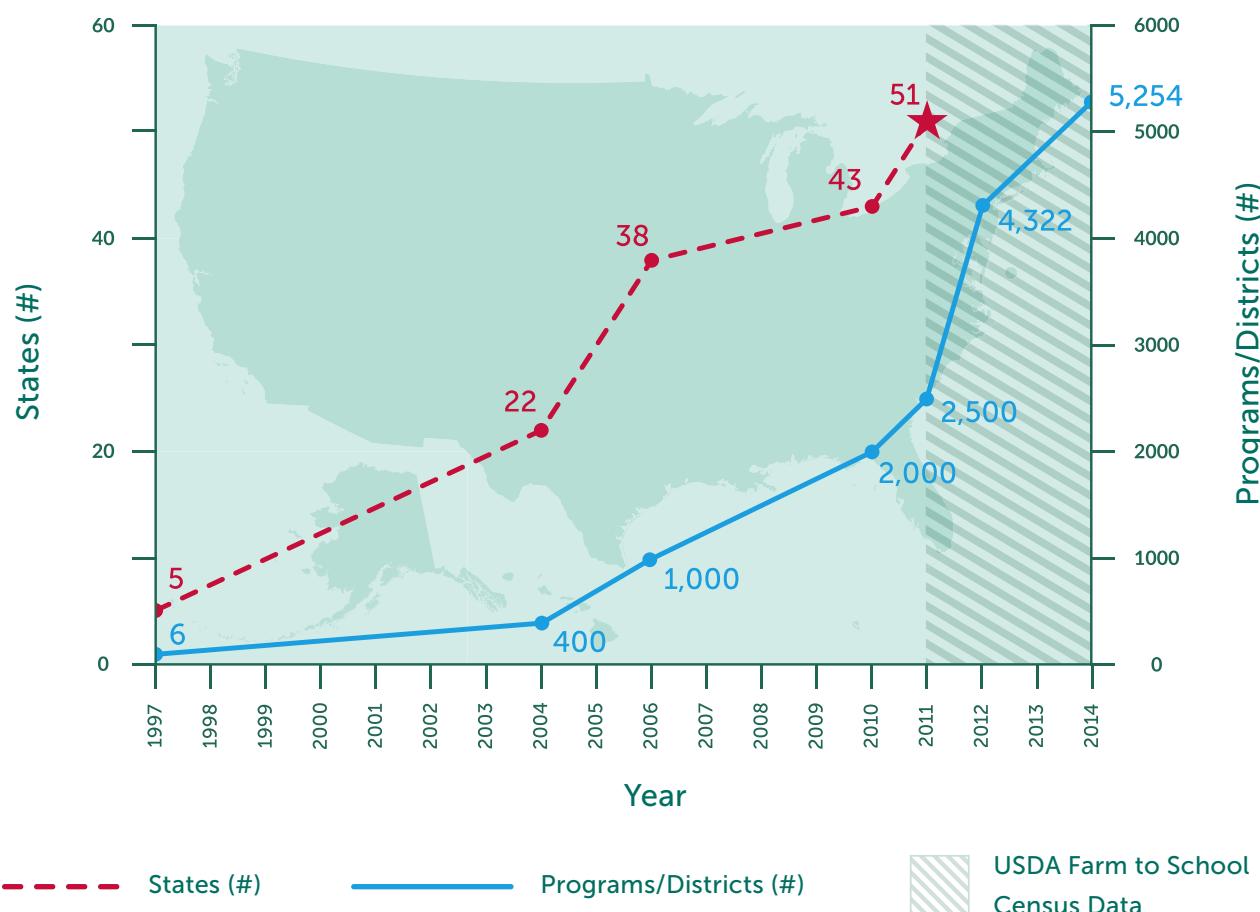
² While the authors recognize the importance of distinguishing between local and regional foods, most notably that local is a necessary but not a sufficient component of regional food systems (Clancy and Ruhf 2010), for the purposes of this report we adopt the guidance and language from [USDA Food and Nutrition Service](#) which does not define local to within a specific geographic distance and may include regionally produced food.

governments, farmers, non-profits, private businesses, higher education, and K-12 institutions for various activities that benefit farm to school procurement (USDA FNS 2016b). A growing number of private and community foundations have also supported farm to

school efforts at local and state levels over the last decade. Increases in these traditional funding sources, along with local community support, have facilitated the rapid growth of farm to school across the country (see Figure 2).

Figure 2: Growth of Farm to School Programs in the U.S. by State and School District, 1997-2014

Source: National Farm to School Network (2016).



- Number of states with farm to school activities taking place as estimated and reported to the National Farm to School Network. Farm to school activities were in all 50 states and Washington, D.C., by 2011.
- Before 2012, number of programs are estimates by the National Farm to School Network based on surveys and self-reported data

from partner organizations. Programs from 1997-2011 are defined loosely as school sites, districts or organizations implementing farm to school at one or multiple locations. National data collection was significantly streamlined with the implementation of the USDA Farm to School Census for the 2011-12 school year. Census data presented in this graphic represents the number of school districts participating in farm to school.

Study overview

Despite the interest in and support for farm to school, there has been limited research to explore its economic impact, including whether farm to school activities, such as local food procurement, strengthen local inter-industry linkages or expand market access for participating producers. The objectives of this research are as follows:

Document estimates of the short-term economic impacts of farm to school sales in the U.S., including how economic impacts vary by key characteristics (e.g., supply chain or business relationships particularly direct versus intermediated, U.S. region).

Apply a best practice economic impact assessment methodology (the U.S. Department of Agriculture's Agricultural Marketing Service Toolkit) to analyze primary and secondary data that represents U.S. farm to school sales and market linkages.

Develop a standardized, replicable framework to assess the local economic impact of a school or school district's shift to local food procurement.

The study was a collaborative effort between the National Farm to School Network (NFSN) and Colorado State University (CSU), with support from CoBank and AgriBank. NFSN is a national non-profit organization that serves as an information, advocacy, and networking hub for communities working to bring school gardens, local food sourcing, and food and agricultural education into schools and early care and education settings. NFSN's mission is to increase access to local food and nutrition education to improve children's health, strengthen family farms and cultivate vibrant communities. NFSN includes core partner and supporting partner organizations in

all 50 states, Washington, D.C., and U.S. Territories, thousands of farm to school supporters, a national Advisory Board and staff. The Food Systems team at CSU is comprised of an interdisciplinary team of faculty, researchers, Extension agents, and students with the mission to have global impact through local engagement in food systems led research, outreach, and instruction.

This study used an approach developed by the U.S. Department of Agriculture's Agricultural Marketing Service (USDA AMS) to inform data collection and modeling (see: "The Economics of Local Food Systems: A Toolkit to Guide Community Discussions, Assessments and Choices" or localfoodeconomics.com), supplemented by the step-by-step protocol for conducting an economic impact assessment of food hubs by Schmit and Jablonski (see: "A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: A Systematic Approach"). This report builds on the above-mentioned resources with an explicit focus on evaluating the unique attributes of farm to school procurement. It is intended to elaborate our understanding of how school districts procure local foods (i.e., directly from farmers, suppliers that market locally branded food products such as "food hubs", and/or traditional suppliers like distributors and food service management companies) and how the structure of these supply chains changes participating farms' inter-industry (supply chain) interactions. It is through understanding these supply chain changes, including the percent of purchases that are local, that one can estimate the economic impacts of local food procurement by schools.

This report presents two preliminary³ case studies to assess the economic impacts of farm to school at two different geographic scales (the school district and the state). For both case studies, a combination of primary

³ The case studies are described as preliminary because of the small sample size. In order to make the case studies more rigorous, further data collection is needed.



Credit: DC Greens

data collected from a limited number of producers engaged in selling to school districts and available secondary data (e.g., USDA's Farm to School Census, USDA's Agricultural Resource Management Survey) has been used. This approach highlights the changing structure of the farm to school supply chain to explore how this might influence future efforts to measure the local economic impact of local food procurement by schools. While local economic impacts might result from other farm to school activities such as school gardens and education, the focus for the study is exclusively on the economic impacts resulting from local food procurement by schools. The focus on local food procurement was chosen because in conversations with stakeholders, it was thought to have the largest potential short-term local economic impact of all the farm to school activities. Though the data collected and compiled herein is limited, the report provides guidance for future data collection and measurement of the local economic impact of local food procurement by schools.

The report provides a summarized introduction to economic impact assessments, reviewing the terminology and appropriate implementation, followed by a summary of current literature on local market trends, local food infrastructure, and barriers to local food procurement for schools. Further, the report highlights and compares previous economic impact assessments of farm to school procurement programs, elaborating on inconsistencies in the approach and rigor. Recommendations for a standardized approach to economic impact assessments of schools' local food procurement methods and findings are presented, along with preliminary applications of this approach with two case studies from Minneapolis Public Schools and the state of Georgia. A discussion on the implications for farm to school procurement and suggested opportunities for future work are also provided.

Economic Impact Assessments

Local food and farm to school advocates are frequently asked to quantify the economic contribution, impact, or benefit of the activities.⁴ While these terms are sometimes referred to interchangeably, it is important to note that they are different and use distinctly different metrics. Watson et al. (2007) provide concise definitions for these terms:

Economic contribution: The gross change in economic activity associated with an industry, event, or policy in an existing regional economy.

Economic impact: The net change in new economic activity associated with an industry, event, or policy in an existing regional economy.

Economic benefit: A net increase in total social welfare. Economic benefits include both market and nonmarket values.

Both contribution and impact assessments seek to better understand the economic activity associated with the chain effect of linked purchases within a geographic area in the short term. Schools generate economic activity through their purchases in a regional economy, be it goods or services. These school purchases set off a series of additional purchases as the businesses from which schools are purchasing products must in turn purchase products in order to have a good or service to sell to the school. The more businesses or industries within a local or regional economy are purchasing from each other, the stronger the inter-industry linkages. Contribution analysis measures the existing linkages and exchanges between industrial sectors, while an impact assessment looks at how a change in purchases (e.g., increasing purchases from a farmer while decreasing

purchases from a wholesaler) ripples through the existing linkages. This report focuses on economic impact assessments given that the purported economic benefit of farm to school activities stem from an increase (change) in local procurement.

As an example of how farm to school procurement might support positive economic impacts, consider a grant from a foundation to expand local food procurement for school meals (economists refer to this as an increase in final demand for farm products), either directly or through an intermediary. These local purchases will have a local economic impact due to shifts in economic activity throughout the local or regional economy. However, it is not known a priori if the local economic impact will be positive or negative.

Economic impacts are broken into three distinct components: 1) direct effect, 2) indirect effect, and 3) induced effect. Using the above example of local food procurement by schools:

The **direct effect** results from the foundation grant (external funds that the school used to facilitate or support new or additional purchases from a farm).

Due to the new or additional sales (output) to the school from a local farm, the farm will need to purchase additional inputs in order to produce the outputs and have something to sell. Additionally, the businesses from which the local farm is purchasing product will also have to purchase additional inputs, as is true for all other linked businesses and industries. The extent to which businesses or industries within the local or regional economy are changing their purchases or expenditures is classified as the **indirect effect**.

⁴ For a more thorough discussion of economic impact concepts and definitions related to local food systems, see Thilmany McFadden, D. et al. 2016. "Module 5: Analyzing the Linkages and Contribution of Local Foods to Local Economies through Input-Output Analysis".

In addition to modifying its purchases from other businesses or industries, the local farm and other linked businesses may also have to change the number of employees or wages paid to employees based on the new or additional sales. Worker wages become household income and households (not just businesses) spend money in the local or regional economy on childcare, groceries, rent, etc. The extent to which household's local purchases change as a result of the new or additional school purchases from a farm is the **induced effect**.

The economic impact of a change in school procurement is calculated as the:

$$\text{direct} + \text{indirect} + \text{induced effect} = \text{economic impact}$$

A total output multiplier⁵ is another way to indicate the extent of linked economic activity within a local or regional economy. It is calculated as:

$$\frac{(\text{direct} + \text{indirect} + \text{induced effect})}{\text{direct effect}} = \text{total output multiplier}$$

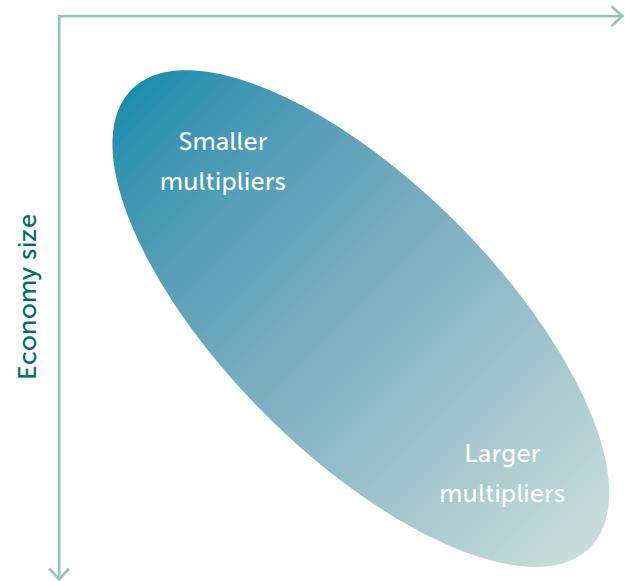
The multiplier for any industry is larger when linkages are greater and there is less leakage. Leakage occurs when businesses, industries, or households spend money outside of the local economy, and thus that spending is not contributing to local direct, indirect, or induced effects. Thus, larger multipliers are achieved either through greater transactions between firms (stronger inter-industry linkages) or by defining the local or regional economy by a larger geographical area (Figure 3). In other words, the size of the multiplier is positively correlated with the degree to which additional purchases are made within a specific geographic region, or the extent to which consumers and businesses within a specific geographic region trade with each other (Schmit et al. 2015).

Figure 3. Illustration of Factors that Drive the Size of the Economic Multiplier

Source: Thilmany et al. (2016: 77).

As described above, economic impact assessments

Strength of linkages



are the **net** change in new economic activity associated with an industry, event, or policy in an existing regional economy. Accordingly, all assessments need to consider potential opportunity costs and countervailing effects associated with local food procurement. In general economic terms, opportunity cost represents the relationship between scarcity and choice. It is the next best alternative or the opportunity foregone when making a specific choice. Opportunity cost is often considered from the demand side. For example, if a school decides to make additional purchases from a local farmer, the opportunity cost of that choice would be the value of displaced purchases from a local distributor. The

⁵ Note that there are many types of multipliers. For a more thorough discussion, see Thilmany McFadden, D. et al. 2016. "Module 5: Analyzing the Linkages and Contribution of Local Foods to Local Economies through Input-Output Analysis".

issue of resource constraints from the supply side is considered a countervailing effect. For example, as more specialty crops are put into production to meet growing demand for local fruits and vegetables, land is likely taken out of producing something else (for example, corn or soy). One cannot only consider the economic impact of the additional specialty crops, but also needs to think about the economic impact of the loss of corn or soy output.

If a school is going to increase its overall expenditures on local food, it may do so through a one-time influx of dollars (i.e., foundation award, grant or donation), or it may decide to shift spending permanently away from something else. In general, a school is unlikely to increase its average per student expenditure (other than adjusting for inflation) based on a desire to purchase local food. So, new local purchases will supplant nonlocal purchases. Understanding the full financial implications of school decision making is key to conducting a rigorous economic impact assessment.⁶ Likewise, farmers are making choices between markets to which they could sell their products (output). With the decision for a farmer to sell to a school is the opportunity cost of potential sales from other markets. If farmers have other markets to which they could otherwise sell their product (with similar returns) then the economic impact of the sales to the school is not necessarily the gross value of the transaction. Further, if the farmer actually sells less product based on the decision to sell to a school, the economic impact could be negative. Though it may be tempting to try to maximize the result or multiplier impact when conducting an economic impact assessment, rigorous research must measure net impacts. The goal should be to get an accurate estimate of how local or regional economies respond based on new or shifted economic activity.



Credit: National Farm to School Network

It is also important to note that while there are many useful applications of economic impact assessments, this approach cannot be used to answer all economic questions. Economic impact assessments are conducted using input-output (I-O) models, which are inappropriate to assess the feasibility and return on

⁶ For an in-depth discussion of how to address opportunity costs in economic impact assessments, see Thilmany McFadden, D. et al. 2016. "Module 6: Addressing Opportunity Costs in the Analysis of Economic Impacts Across Local Food Systems".

investment of farm to school activities. I-O models are static, and include unconstrained demand. The model therefore does not contain information about whether or not markets or land/water resources are available should a farmer decide to scale up production. Accordingly, the modeler must be very careful and transparent about assumptions (Thilmany et al. 2016).

While I-O models can be built from scratch, many researchers and practitioners use IMPLAN software and data given its ease of use. IMPLAN is a partial equilibrium model that relies on an I-O table showing the flows of economic activities within a region's economy. The I-O tables are based on regional and sometimes national averages that represent economic linkages. These linkages take the form of a production function, which specifies how inputs are assembled in order to produce a unit of output. Another way to think of the production function is the sector's recipe to produce goods and services (output). Data for the IMPLAN database are supplied by the U.S. Department of Commerce, the U.S. Department of Labor Statistics, the U.S. Department of Agriculture, and other federal and state government agencies. At the time of writing this report, IMPLAN includes 536 sectors based on the North American Industry Classification System (NAICS) to represent the economy. The agricultural production sector is represented by 14 of the 536 sectors.

Local and regional food system economic impact models can be modified to more accurately describe the expenditure function and linkages of the local and regional production sector. This step is helpful as the most disaggregated agricultural sector in IMPLAN include, for example, fruit farming, or vegetable and melon farming. These sectors reflect industry averages and are weighted towards larger farms. Farms that sell through local markets tend to be smaller in scale, more diversified, and use significantly more labor as a

percentage of total expenditure (much of this is due to the fact that they are taking on additional supply chain functions such as marketing, processing, and distribution). As discussed earlier, these differences in expenditures (and thus linkages within the local or regional economy) are key to capture and accurately understand economic impacts. Previous research has shown that modifying distinct local and regional food sectors from more traditional or commodity oriented sectors makes a difference in the resulting economic impact assessment (Schmit et al. 2016; Rossi et al. 2017). Modifications can be informed by more detailed primary survey/interview or secondary data. This report demonstrates how to use a combination of survey and secondary data to modify expenditure functions in IMPLAN that more accurately account for linkages between farms and schools in a local economy.

Current Research



Current Research

Local food market trends

Interest in and data about local food markets continues to grow. Direct to consumer agricultural sales doubled in the United States between 1992 and 2007, but appears to have plateaued between 2007 and 2012 (O'Hara and Low 2016). Low et al. (2015) provide evidence from the USDA's Census of Agriculture and the Agricultural Resource Management Survey (ARMS) that growth in local food sales is occurring through intermediated markets (e.g., sales to institutions, food hubs, or regional distributors). The USDA Census of Agriculture's 2015 Local Food Marketing Practices Survey, the first-ever national survey focused on local food market practices, found that 167,009 producers sold through local markets in 2015. Sales totaled \$8.7 billion, of which 35% was sold direct to consumer (e.g., farmers markets, road side stands, Community Supported Agriculture), 27% was sold to retailers (e.g., Whole Foods, Krogers), and 39% was sold to institutions (e.g., K-12 schools, universities, hospitals) and non-traditional suppliers (e.g., suppliers that market locally-branded food products such as "food hubs") (USDA NASS 2016). Since there is only one year of data available through this survey, we are unable to use it to study trends in local food sales or markets, but the potential exists in the future.

Local food infrastructure and barriers to farm to school

The majority of food at home expenditures by U.S. households are made at retail (intermediated) markets (USDA ERS 2016). Perhaps because of this, USDA investment to scale up local and regional food

sales has focused on developing food businesses, infrastructure, and markets. Between 2009 and 2014 the USDA invested over \$1 billion in more than 40,000 local and regional food businesses and infrastructure projects. Support for farm to school has been incorporated into many of these local food policies. In addition to the Farm to School grant program maintained by the Food and Nutrition Service, other USDA programs that fund farm to school include Agricultural Marketing Service (Farmers Market and Local Food Promotion Program Grants), Farm Service Agency (farm loans and farm storage facility loans), National Institute of Food and Agriculture (beginning farmer and rancher development grants, sustainable agriculture research and education grants), and Rural Development (business and industry guaranteed loans, rural business enterprise and opportunity grants, and value-added producer grants) (USDA FNS 2016b).

The rationale for these investments is the perception that the infrastructures for local foods are under-developed, limiting the ability to increase local food purchases, particularly for schools (Becot et al. 2017; Matts et al. 2016; Roche et al. 2015; Vogt and Kaiser 2008). Previous research showing limited farm sales to schools points to challenges with supply chain logistics, including high transaction costs and regulations, which limit market potential (Dimitri et al. 2012; Izumi et al. 2010; Ohmart 2002; Thompson et al. 2014). As a result, farmers who want to sell to schools may rely on direct to school sales (Feenstra and Ohmart 2013; Joshi and Beery 2007).

Direct to school sales are often associated with high transaction costs and typically account for a small percent of farm sales (Feenstra and Ohmart 2013; Joshi and Beery 2007). Transaction costs are the costs

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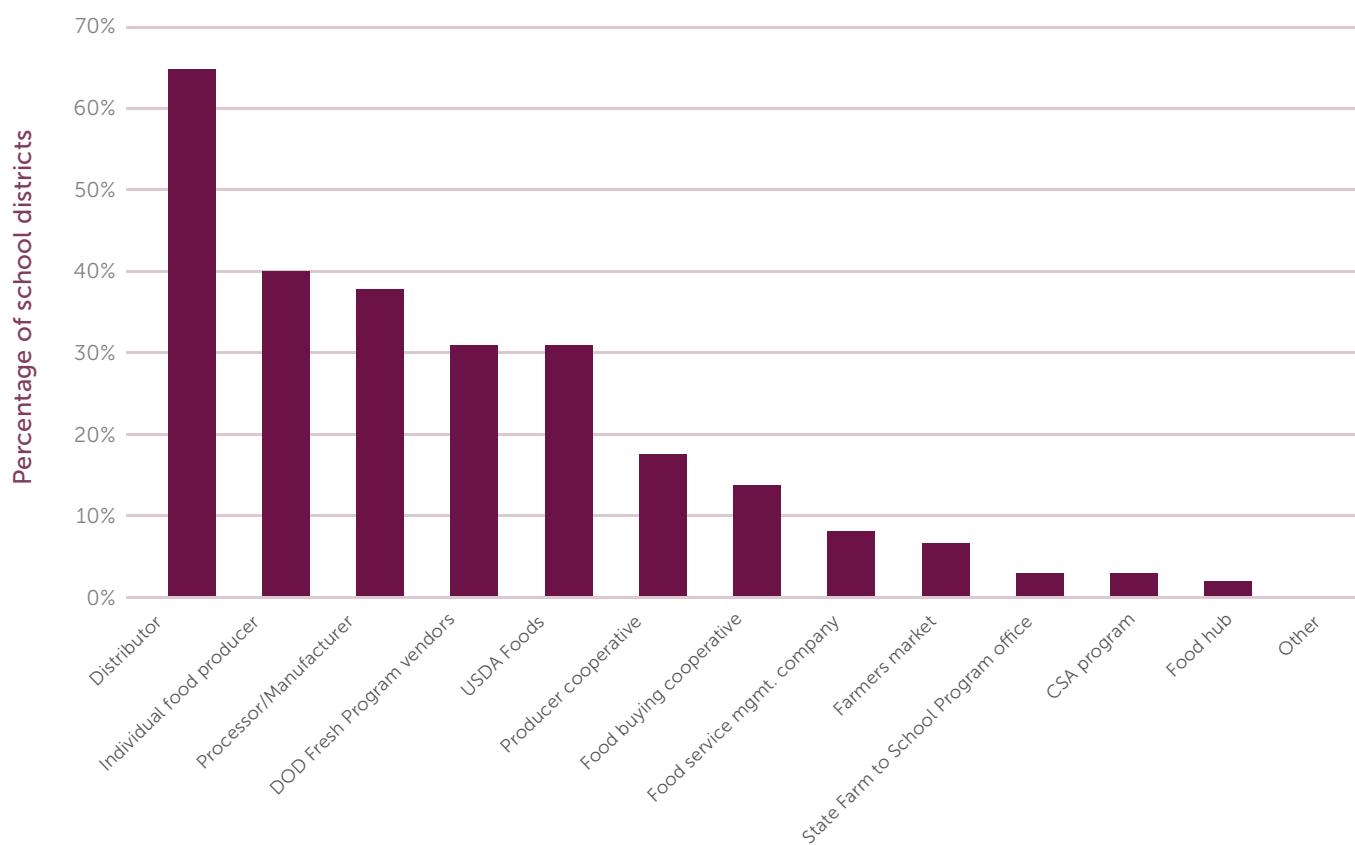
associated with the exchange of goods and services. Motta and Sharma (2016) and Matts et al. (2016) identify three types of transaction costs for both food service directors and farmers associated with the procurement of local foods in schools: information, negotiation, and monitoring costs. Information costs include those associated with finding a buyer or seller for a product with a local attribute. Negotiation costs include determining prices, product quantities, and quality standards. Monitoring costs include quality and food safety assurances or attributes.

The underdevelopment of these supply chains also contributes to challenges in collecting and tracking

procurement data. As the director for Woodbridge School District 68 responded to an open-ended question in the 2013-2014 USDA Farm to School Census, "We have a management company, not sure who they purchase from" (USDA FNS 2015). More concerning is the difficulty of trying to quantify total local and regional food purchases as another director from Orcutt Union Elementary School put it, "I don't keep separate records for local foods and couldn't imagine how I would go back to get this info. My guess isn't close to being accurate, so shouldn't be used at all. If you want this info, you should ask us to set up a system in advance" (USDA FNS 2015).

Figure 4. Supply Chains Utilized by School Districts for Local Food Purchases

Source: Christensen et al. (2017) using data from the 2013-2014 Farm to School Census (USDA FNSa 2016).



Food hubs are an emerging supply chain infrastructure model with potential to address the challenges highlighted above by increasing sales to markets such as schools while maintaining transparency along the supply chain. According to the 2015 National Food Hub Survey, 31% of food hubs have K-12 food service customers (Hardy et al. 2016), yet Christensen et al. (2017)⁷ found in their analysis of the 2013-2014 Farm to School Census that less than 5% of districts were purchasing from food hubs (Figure 4). Roche et al. (2014) found that food hubs can play an integral role in overcoming many of the barriers associated with direct farm to school sales, including issues of quality control, food safety assurance, and consistent availability. According to the USDA Agricultural Marketing Service (n.d.), food hubs support farmers and ranchers, especially smaller and mid-sized operations, to gain access to retail, institutional, and commercial food service markets that they might not be able to access on their own. Food hubs are diverse, but usually offer a combination of aggregation, distribution, and marketing services at a price that makes it possible for producers to gain entry into larger volume markets, with the ultimate goal of increasing farmer income.

Intermediated local food sales to schools, particularly via food hubs, are not without challenges. As Feenstra and Ohmart (2012) suggest, reliance on an intermediary reduces the transparency in the system and results in less of the total money spent by schools reaching the pockets of farmers. Further, in their 2012 Regional Food Hub Resource Guide, the USDA identified four persistent challenges facing food hubs: 1) balancing supply and demand; 2) price sensitivity; 3) managing growth; and 4) access to capital. Some food hubs also noted the challenge their smaller scale operations faced in meeting food safety requirements. Christensen et al. (2017) also found that schools that purchase local food direct from producers or through non-traditional distributors, like food hubs, are likely

to have lower on average local food expenditures per student compared to schools that purchase local food from traditional distributors.

Previous studies on the economic contribution and/or impact of farm to school

Several previous studies measure the economic contribution and/or impact of school's local food procurement. Each of these previous economic assessments use different approaches, making cross-comparisons difficult and reflecting a need for a best practice approach that is more standardized for evaluating the economic impacts of farm to school procurement.

Researchers from the University of Vermont (Becot et al. 2017; Roche 2016) provide a detailed summary of six studies that investigate the regional economic contribution and/or impact of local food procurement for farm to school using IMPLAN (see Table 1) (Gunter 2011; Kane et al. 2010; Kluson 2012; Pesch 2014; Roche et al. 2016; Tuck et al. 2010). None of the reviewed documents are peer-reviewed, except for Gunter (2011), who later published her master's thesis in a summarized format (Bauman and Thilmany McFadden 2017). It is important to note that many of the researchers had very limited budgets and timelines, as a result it was often not feasible to collect primary data.

Based on the guidance for local food economic impact assessments provided in the USDA AMS Toolkit, we assessed each study for their inclusion of certain key components. Specifically, whether or not authors described: 1) their methodological approach and assumptions in such a way that the study could be replicated, 2) the geographic region and why it was selected, 3) if/how they augmented or modified secondary data (such as that found within IMPLAN)

⁷ Presentation and manuscript available upon request.

Table 1. Summary of Farm to School Economic Contribution and/or Impact Assessment Studies

Source: Adapted from Becot et al (2017).

Study	Haynes 2010 and Tuck et al. 2010	Kane et al. 2010	Gunter 2011	Kluson 2012	Pesch 2014	Roche et al. 2016
Location	Minnesota	Oregon	Colorado	Florida	Minnesota	Vermont
Model geographic scale	5 county region (5,600 sq miles)	State of Oregon (98,000 sq miles)	2 county region (6,500 sq miles) and 6 county region (13,500 sq miles)	Unspecified	12 county region (23,890 sq miles)	Statewide (9,600 sq miles)
Size of school district	Cass, Crow Wing, Morrison, Todd, and Wadena counties (20,840 students)	Portland Public Schools (47,000 students) and Gervais school district (1,500 students)	Weld 6 Greeley (19,500 students)	Sarasota School District (42,000 students)	68 K-12 schools and 396 healthcare facilities (66,900 students)	Vermont (94,000 students)
Type of study	Impact (three scenarios: one special meal, unprocessed substitution, substitute all)	Impact (\$462,000)	Contribution and impact (\$20,900-\$39,125 in planned purchases)	Contribution (\$107,000 in existing purchases)	Contribution (\$33,000 worth of sales) and impact (20% of all institutional food purchases from local growers)	Contribution (\$914,943 existing purchases) and impact (three scenarios: increases in purchases)
Supply chain structure	Direct	Not specified	Direct	Not specified	Not specified	Combination of direct and intermediated
Customization of IMPLAN agricultural sectors	Yes, using survey data	No	Yes, using survey and secondary data	No	No	No
Sample size	11 farmers	No farmers interviewed	14 farmers	No farmers interviewed	No farmers interviewed	No farmers interviewed
Includes countervailing effects (shift in purchases from wholesaler to food producer)	Assumes no loss to current wholesalers because they are not in the region	No	Subtracts the impact of the wholesale sector from the farming sector	No	Assumes a loss of 75% of total new sales to the wholesale sector	Margins purchases shifted from wholesale and transportation sector to direct from producers
Multipliers	Sales: 1.03-1.25	Sales: 1.86	Sales: 1.47-1.63	Sales: 2.4	Sales: 1.7-2.9	Sales: 1.6

based on interviews with farmers or other secondary data to more accurately reflect local and regional food system activities and farm expenditure patterns, 4) how food moves from farm to school (inter-industry linkages), and 5) if farm to school procurement included opportunity cost or countervailing effects.

Haynes (2010) and Tuck et al. (2010) assessed the impact of increasing local food procurement in the school districts within a five-county region in Minnesota. The authors compared three scenarios: 1) locally grown products featured in one school meal per month, 2) locally grown products replacing five unprocessed ingredients, and 3) locally grown products replacing ten processed and unprocessed ingredients. The authors created four farm to school agricultural production sectors (fruit, vegetable, grain, and cattle) using the existing corresponding IMPLAN sectors, with slight modifications to the transportation and processing coefficients to more accurately reflect local food production. This is one of only two of the reviewed studies that described conducting interviews with farmers prior to building the model. The interviews did not include farm-specific economic information, but the authors did a number of sensitivity tests with regards to the per-unit prices that schools paid for food. While the authors acknowledged a decrease in demand for ingredients from non-local sources, they did not account for the opportunity cost because all of the existing distributors were located outside the geographic boundary. The report did not describe the way in which the food travels from the farm to the school.

Kane et al. (2010) argued for an additional \$0.07 per meal to be allocated to schools in Oregon to purchase local food products. They used examples of two school districts, one urban and one rural, to illustrate the economic impact the change in policy could have on the state. The authors did not modify the agricultural production sector in IMPLAN to account for differential expenditures of farms selling through local markets and did not conduct farmer interviews.

They also did not address potential opportunity costs associated with the new local food purchases (for example, due to decreasing school purchases from local distributors). The report did not describe the way in which the food travels from the farm to the school.

Gunter (2011) created three scenarios to study the economic activity as a result of a Colorado school district's local food purchasing program. Gunter customized the models' industry production function and regional purchasing coefficients using survey and secondary data. Shifts in school purchases from wholesalers in the region to producers in the region were accounted for, but the research assumed that local products moved directly from farm to school.

Kluson (2012) reported findings on the economic impact of farm to school in Sarasota County, Florida. The report provided limited data on the assessed components and did not describe the geographic boundary of the model or if the local food producers' expenditures were modified.

Pesch's (2014) report estimated the economic impact of farm to institution sales, including schools as well as hospitals, in Minnesota. The study boundary included the same five counties as the Hayes (2010) and Tuck et al. (2010) study plus an additional seven counties. Pesch created two scenarios with slight variations: 1) comparing existing crop schedules and 2) extended cropping through season extension methods (e.g., high tunnels, greenhouses). The multiplier for the first scenario is 1.9 and 2.7 for the second. Pesch (2014) did not modify the IMPLAN sectors. The study is not based on farmer interviews and does not address how the product gets from the farm to institution.

Roche et al. (2016) assessed the contribution and impact of farm to school in Vermont. The study did not customize the IMPLAN agricultural sector, and in fact aggregated all of the agricultural and food processing sectors. The authors presented three scenarios of change in demand for local food. The first scenario assumed that 75% of Vermont schools



Credit: David Tavani

double their local food purchases from the baseline, the second scenario assumed schools with “universal school meals”, a meal program that allows all students to eat for free, increase demand for local food by 10%, and the third scenario assumed schools no longer purchase local food. This study is the only one from the list to explicitly account for intermediated farm to school sales and for the opportunity cost of local food substitution.

Each of the studies found that the economic impact of farm to school was greater than the existing agricultural production sector, though modestly so. Yet, the biggest takeaway from reviewing previous studies is the breadth of approaches undertaken for conducting the economic impact assessment. Despite the variation, the six studies share a common focus on estimating the demand side of local food

procurement, rather than accurately modeling local food production and thus local inter-industry linkages. This is a significant shortcoming in the data. Changes in the production function and regional purchasing coefficients can have significant impacts on the multiplier.⁸ Aside from the many relationships that exist between the producer and the consumer (schools, in the case of farm to school), there are a host of additional, often stronger linkages that exist between producer and other sectors of the local economy, including local suppliers from which producers purchase inputs (Jablonski et al. 2016; Thilmany et al. 2016). Finding data to reflect these changed linkages often adds significant time and cost to conducting the study. As part of the current study, we present a standardized approach for measuring the economic impact of farm to school procurement and test it using two case studies.

⁸ For an in-depth discussion of how production functions are constructed within IMPLAN, see Lazarus, W., Platas, D., and Morse. G. 2002. “IMPLAN’s Weakest Link: Production Functions or Regional Purchase Coefficients.” *The Journal of Regional Analysis & Policy*. 32(1):33-49, and Liu, Z., and Warner, M.. 2009. “Understanding Geographic Differences in Child Care Multipliers: Unpacking IMPLAN’s Modeling Methodology.” *The Journal of Regional Analysis & Policy*. 39(1):71-85.

Methods



Methods

We used a combination of primary and secondary data to investigate farm to school sales and market linkages. Specifically, the goals of primary data collection were to: 1) provide descriptive data about the type of farms selling to schools, including information about producer level of satisfaction with those transactions, 2) understand if/how farmers shifted their operations based on the availability of school markets (for example, did they increase production, did they shift product from one market to another), and 3) come up with an average farm expenditure profile that could be increased by the total number of farms in the study area selling to schools to create a new farm to school industry sector in IMPLAN. Best practice economic impact assessments of farm to school food procurement require information from producers or available and relevant secondary sources to inform model data and assumptions.

The primary data used in this report was collected using a survey of a convenience sample of producers currently selling to schools. The survey was developed collaboratively by CSU and NFSN, and included twenty questions that asked farmers about their production practices, sales, markets, overall satisfaction with selling to schools, and participation in various farm to school activities (see Appendix 1). The instrument was explicitly designed to be as short as possible while still eliciting the information needed for model customization, enhanced understanding of how to define a region, as well as potential opportunity costs and countervailing effects. The survey focused on six general expenditure categories that account for 66% of all variable expenditures for all local farmers and ranchers with gross cash farm income up to \$350,000 (ARMS 2013). The survey did not include information about the local purchasing percentage (LPP) – the

share of input purchases from local sources. IMPLAN coefficients were used as a secondary data source which is expected to result in a more conservative multiplier as local producers are more likely to purchase inputs locally (Jablonski, Schmit, and Kay 2016; Pesch and Tuck 2015). Using responses from the survey, average production functions for producers in the two case study sites were created, which were then compared to an aggregate fruit and vegetable farming sector in IMPLAN.

The survey was pilot-tested by six farm to school stakeholders before launch. The research was conducted in accordance with CSU Human Research Protection Program and was deemed exempt (IRB#288-17H). Producer surveys were conducted by NFSN staff and FoodCorps fellows, and alumni, with CSU providing a webinar training and a practice survey to ensure consistency across enumerators. Twenty-six producers selling to schools in nine states (Georgia, Indiana, Michigan, Minnesota, New Jersey, North Carolina, Pennsylvania, Utah, Wisconsin) and the District of Columbia completed the survey. Descriptive statistics for all 26 producers are presented in the report, but due to the very small sample size, only data from the two locations with the highest number of responses, Minnesota and Georgia with 5 and 6 completed responses, respectively, was used to test the expenditure data collection tool and to demonstrate how a more generalizable, representative sample could be used to support best practice economic impact assessments.

In addition to the primary data and data from IMPLAN, two additional secondary datasets were utilized – the 2012 Phase III USDA ARMS to inform our survey protocol development and compare



Credit: National Farm to School Network

average expenditure for farms that utilize school markets".⁹ The ARMS is an annually conducted nationally representative survey of approximately 30,000 farms, and includes data on gross cash farm income, marketing channels utilized, key product segments, region where operation is located, fixed and variable expenses, assets, debt, and farm and operator characteristics. From the ARMS data set, financial benchmarks that included 11 expenditure categories¹⁰ were compiled. Based on previous survey experiences with farmers, the researchers have found it easier to get answers to financial questions if respondents are provided an industry average from which the

farmer can explain why or how their farm deviates. For example, "approximately what percent of your farm or ranch's total expenditures were devoted to the following categories? (the sum of these expenses should not equal more than 100%) - Fertilizers and chemicals (average expenses were 12%)?".

Unfortunately, due in part to the fact that ARMS is congressionally mandated to focus on the core agricultural states, which generally do not align with where most farm to school sales occur, there were only 52 respondents in the 2013 data that reported positive farm to school sales. Thus, we were unable to break down responses by geographic area.

9 Accessing ARMS data at the farm level is restricted and requires an agreement with the USDA Economic Research Service. For a more in-depth discussion of methods associated with utilizing ARMS data to compare farmers and ranchers utilizing local food marketing channels, see Thilmany McFadden D., Bauman, A., and Jablonski, B. B. R., 2017 "The financial performance implications of differential marketing strategies: Exploring farms that pursue local markets as a core competitive advantage."

10 The expenditure categories include contract work, chemical inputs, fuel, labor, maintenance/repair, seed, utilities, livestock feed, purchased livestock expenses, other livestock expenses, and other variable expenses.

Survey Findings



Survey Findings

Of the 26 farms interviewed, 20 grew vegetables, 13 produced fruit, and two also raised livestock. There was a large range in the size of operations, which warrants further investigation both in terms of the total number of farms selling to schools as well as the proportion of farm to schools' sales attributed to different size farming operations. The farms ranged in size from half an acre to 500 acres. The average farm size was 69 acres. The farms ranged in total sales from \$9,500 per year to \$8 million with the average sales being \$920,000. All of the farms started selling to schools after 2005, with the majority starting after 2011 (Figure 5).

As part of our effort to understand how farmers responded to the availability of school markets, we asked them why they started selling to schools.

Their responses fell into four broad categories:

- Provided a market;
- Opportunity to educate youth;
- Approached by school; and,
- Already selling to an intermediary that began to sell to a school.

Ten farmers expressed that schools provided a needed market for a product. One farmer explained, "We grow a lot of good keeping winter apples that harvest late and our retail business slows after the end of October, so we need a market for them." Seven farmers stated they started selling to schools because they had been approached by someone at the school. An additional seven expressed that farm to school sales provided a unique opportunity to educate youth about healthy

Figure 5. Year Surveyed Farmers Started Selling to Schools

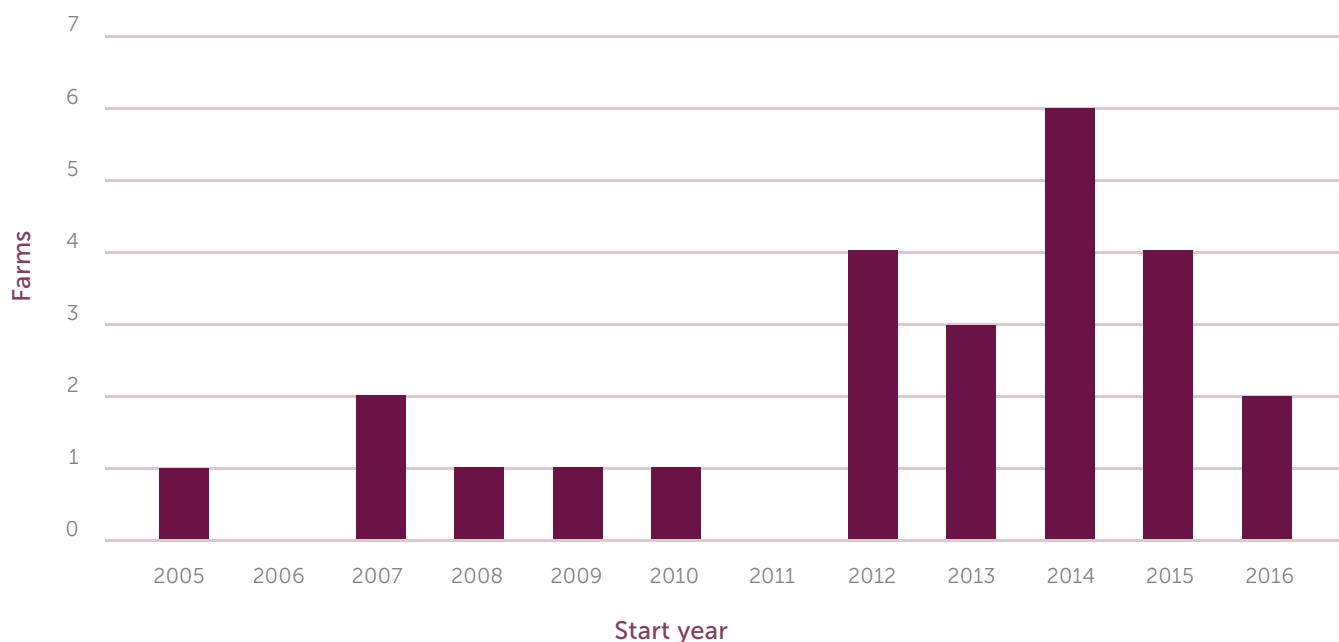


Photo on previous page: Emma Cassidy

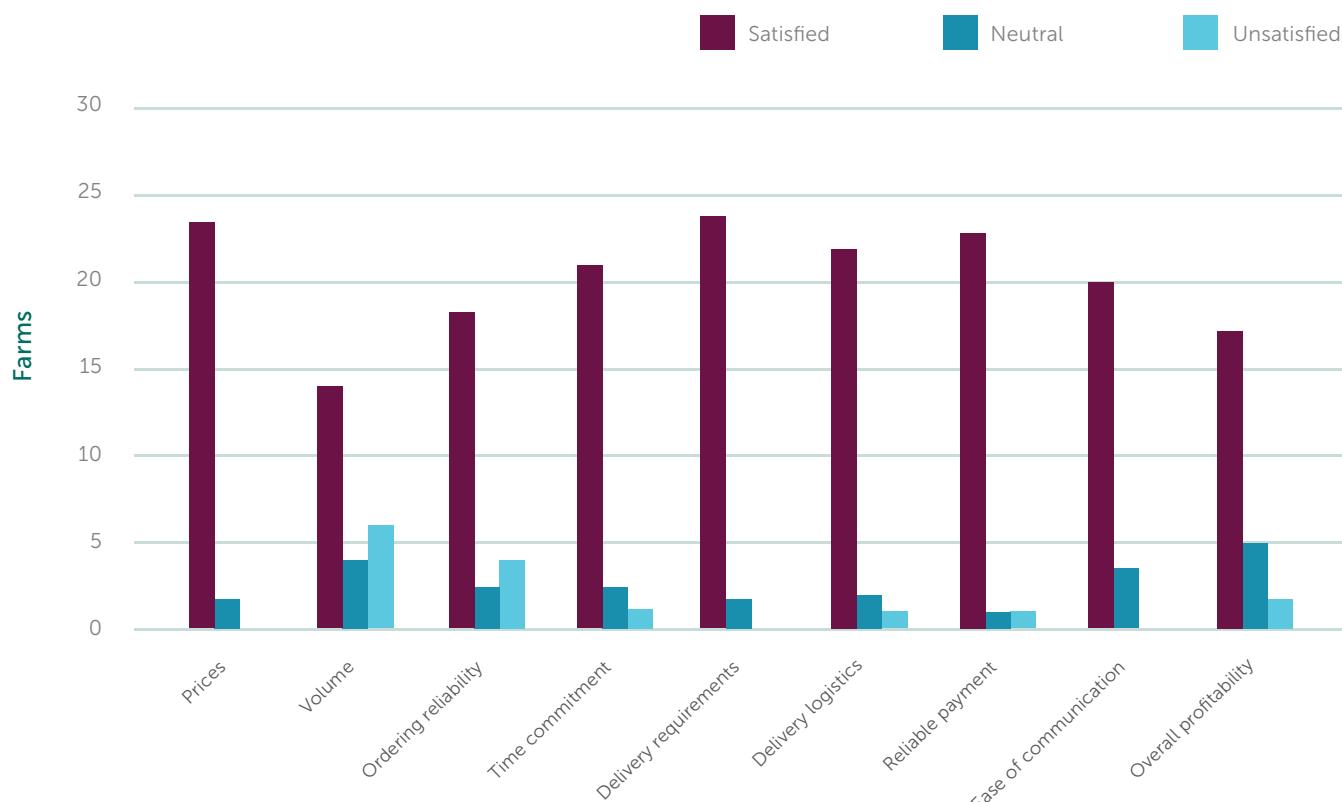
food options and agriculture. Three farms noted that they had already been selling to an intermediary that just started selling to schools, and that it was not an active decision on their part.

The structure of the farm to school supply chain is important when conducting an economic impact assessment. Direct sales from farm to school represent different inter-industry linkages within a local economy than sales from farm to intermediary to school. The fact that intermediaries facilitate the majority of farm to school transactions also poses new challenges for identifying producers engaged in farm to school and measuring supply and demand for local and regional foods in schools. Three of the farms surveyed had no direct sales to schools, but instead sold through an intermediary. Twelve farms noted that some of the product they sell to intermediaries ends

up at schools. Understandably, some farmers struggled to estimate the percent of their intermediated products sold to schools, as one farmer explained, "My food hub doesn't share that information."

All of the surveyed farms planned to continue selling to the schools in the future and were generally satisfied or very satisfied with selling to schools (Figure 6). Farmers were most satisfied with delivery requirements (24), prices (23), reliable payments (23), delivery logistics (22), time commitment (21), and ease of communication (20). Only seven farms were very satisfied with the overall profitability of selling to schools, and eleven were satisfied. The biggest challenge mentioned was volume. Seven farmers, in seven different states, noted they were unsatisfied or very unsatisfied with the volume of sales to schools.

Figure 6. Farmer Satisfaction with Various Aspects of Selling to Schools



Case Studies



Case Studies: Economic Impact of Farm to School Procurement in Minneapolis Public Schools and Georgia

Due to the small sample size of surveyed farmers, this report illustrates the approach to modeling the economic impact of farm to school sales with two sites, Minneapolis Public Schools and Georgia. Using the primary and secondary data described in the previous section, an economic impact assessment of farm to school local food procurement at the district and state level was conducted. A step-by-step guide to constructing a model in IMPLAN, including screen shots, is provided by Schmit and Jablonski (2017). By adjusting the default assumptions in IMPLAN, the researchers sought to create a more accurate model for farm to school economic impact.¹¹

Defining the study area

Minneapolis Public Schools (MPLS) serves the city of Minneapolis, Minnesota. Nearly 37,000 students are enrolled in the 96 public primary and secondary schools in the district (NCES 2017). According to the 2013-14 Farm to School Census, 63 schools within the district sourced local fruits, vegetables, milk, meat, and poultry for their breakfast and lunch meal programs. Products were sourced directly from producers and through intermediaries (food hubs, distributors, and

food manufactures) (USDA FNS 2015). In the 2013-2014 school year, the district spent \$7,842,090 on total food, with 13% spent on local foods (excluding milk).¹² The district defines local as within a 200-mile radius including 163 counties in four states, which we used as our study area. We collected survey responses from five fruit and vegetable producers selling directly to the MPLS. The five farms are widely dispersed (Figure 7). One producer was located on the western border of the state, and two producers were in Wisconsin. The remaining two were located just south of Minneapolis. For this study, it is estimated that there are 32 farmers selling to MPLS. This calculation was made by dividing the total local food purchases by MPLS (\$1,057,880) by the average farm to school sales (\$33,205) from the five surveyed farms. Based on producer survey responses, it is assumed that 50% of the sales were sold directly to schools and 50% went through an intermediary. According to the default data in IMPLAN, the wholesale trade sector (which includes food intermediaries) has a margin of 17%.¹³

The state of Georgia, our second case study, covers 180 public school districts, 62% of which participate in farm to school. According to the 2013-14 Farm to School Census, 82 districts sourced local foods

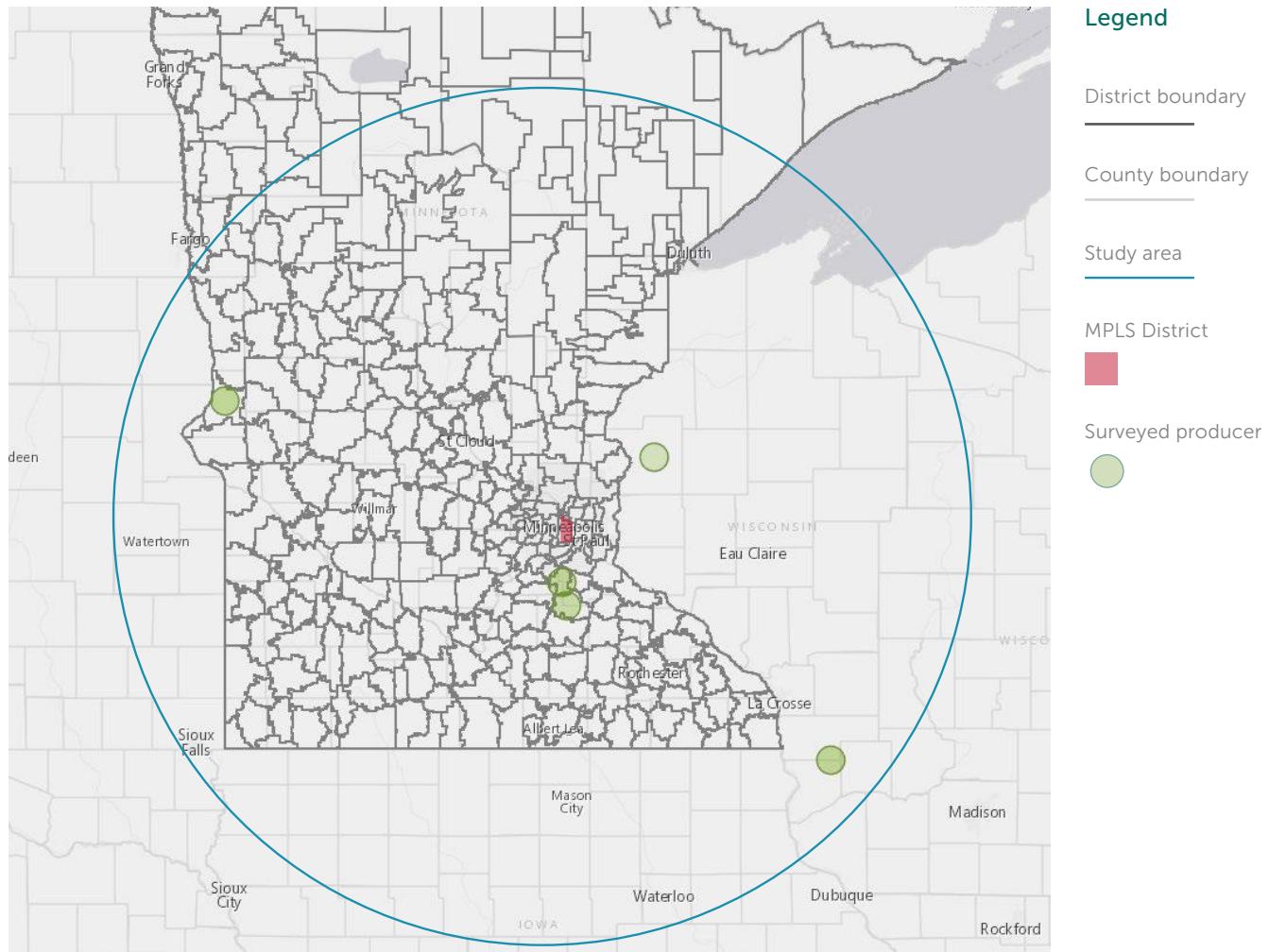
¹¹ While there are other software programs and data available for this type of analysis, IMPLAN is most widely utilized in the field of local and regional food systems. This is in large part due to the ease with which modifications can be made to the model. Any users wanting to follow the steps outlined in this document must obtain a IMPLAN license. Modifying IMPLAN can be tricky and often requires a fair amount of experience in customization, knowledge of the limitations of the software, and expertise conducting rigorous research making sure to note assumptions and methodologies.

¹² Milk was excluded from the calculation of total food purchases because none of the surveyed farms raised dairy cows.

¹³ In an effort to keep the survey as short as possible, the survey did not ask farmers about sales to specific types of intermediated markets but aggregated the category to include food hubs, processors, distributors, and brokers. There may be slight differences in the specific sector margins, for example the National Good Food Network (2015) found that the margin for food hubs is 14.5%.

Figure 7. Map of Surveyed Producers Selling to MPLS District

Source: Esri, HERE, Garmin, National Geospatial-Intelligence Agency (NGA), U.S. Geological Survey (USGS), National Park Service (NPS).



for a meal program with 615 schools and 1,226,410 students. Seventy-three districts sourced local products through an intermediary, 32 districts sourced directly from producers, and no districts sourced through food hubs. Total food costs data was available for 61 of the 82 districts and indicates a total of \$170,622,272 was spent on all food. Data from 54 districts regarding local food expenditures totaled \$10,266,746 (excluding milk).

Extrapolating the school expenditure patterns to all the

districts in Georgia that source local food, we assumed that the 82 districts are spending \$229,361,086 on total food and \$15,590,243 on local food excluding milk. For the purposes of this study, it is estimated that there are 92 farms selling to schools in Georgia which was calculated by dividing the total local food purchases by Georgia schools (\$10,266,746) by the average farm to school sales (\$110,407) from the six surveyed farms. Based on the producer survey responses, it is assumed that 45% of the sales were sold directly to schools and 55% went through an intermediary. According to the

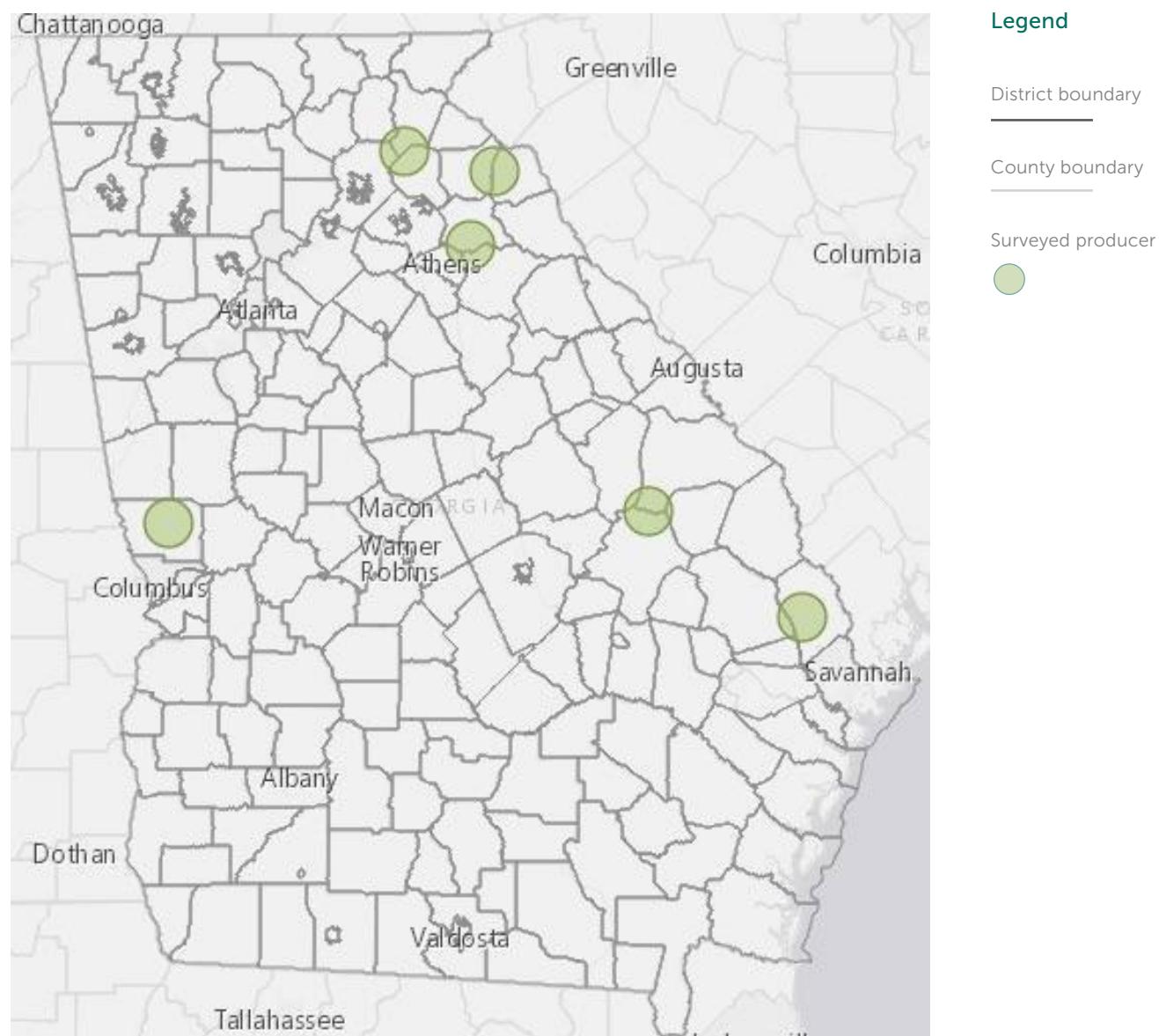
default data in IMPLAN, the wholesale trade sector (which includes food intermediaries) has a margin of 17%. The region was defined as all the counties within the state; there are 159 counties in the study area. Survey data was collected from six fruit and vegetable

producers within the study area (Figure 8).

Defining farm to school producer transactions in Minneapolis Public

Figure 8. Map of Surveyed Producers Selling to Schools in Georgia

Source: Esri, HERE, Garmin, NGA, USGS, NPS.



Schools and Georgia

In general, the larger the expenditure category, the more it will affect the results. The producer survey focused on six general expenditure categories that account for 66% of all variable expenditures for all local farmers and ranchers with gross cash farm income up to \$350,000 according to ARMS (Table 2). Using the six expenditure categories we captured 68% of the MPLS farmers' variable costs, and 73% for farmers in Georgia. What may be most surprising, particularly in Georgia, is how similar the survey data is to the IMPLAN data, particularly labor. The authors do

not have an explanation for why this is the case.

Tables 3 and 4 present the average farmer expenditure profile for the two case studies after margined purchases from retail and wholesale firms.¹⁴ Any purchases from wholesalers and/or retailers must be margined, as only the margin, that is the sales less cost of goods sold, is included in these industries within IMPLAN.

Table 2. Share of Variable Costs Attributed to the Top Six Expenditure Categories

Source: USDA ARMS (2013); IMPLAN (2013). ARMS data compiled by Allie Bauman, Colorado State University.

Expenditure category	ARMS local food farmers (sales up to \$350,000)	ARMS farm to school farmers	IMPLAN MPLS fruit and veg farmers	MPLS farm to school farmers	IMPLAN Georgia fruit and veg farmers	Georgia farm to school farmers
Labor	0.12	0.29	0.41	0.47	0.27	0.27
Fertilizer and chemical inputs	0.11	0.12	0.13	0.03	0.10	0.23
Fuel and transportation	0.12	0.09	0.05	0.03	0.06	0.05
Maintenance and repair	0.14	0.11	0.05	0.06	0.06	0.05
Utilities and rent	0.09	0.09	0.04	0.04	0.05	0.05
Seeds	0.08	0.09	0.02	0.04	0.02	0.07
All other variable costs	0.34	0.22	0.31	0.31	0.43	0.26

¹⁴ In the current version of IMPLAN, the margin sectors are 395 wholesale trade businesses, various retail trade sectors 396-407 including retail trade food and beverage, and various transportation sectors 332-335. For a description of margining in I-O models see Thilmany et al. 2016 Module 6: Addressing Opportunity Costs in the Analysis of Economic Impacts Across Local Food Systems.

Table 3. Average MPLS Farm to School Farm Business Expenditure Profile and Mapping to IMPLAN Categories^a

Expenditure category	IMPLAN category	Per Farm Expenditure	Total Expenditure	LPP	Expense share
Fertilizers	Pesticides and ag chem mfg (172) - apply margins ^b	\$10,460	\$334,720	22.9	0.025
Maintenance and repair	Retail -building material and garden equipment supply stores (399) – apply margins ^c	\$17,770	\$568,640	99.3	0.043
Fuel	Petroleum refineries (156) - apply margins ^d	\$10,050	\$321,600	67.5	0.024
Rent and utilities	Electric power transmission and distribution (49)	\$14,025	\$448,800	94.6	0.034
Seeds and plants	Fruit and vegetable farms (3 and 4)	\$12,620	\$403,840	33.4	0.030
Other expenditures		\$99,912	\$3,197,184	varies	0.241
	Total intermediate input purchases	\$164,837	\$5,274,784		0.398
Wages and benefits	Employee compensation	\$152,800	\$4,889,600	100	0.369
Taxes (all)	Tax on production and imports ^e	\$4,663	\$149,216	100	0.011
Interest and depreciation	Other property type income	\$38,725	\$1,239,200	100	0.094
Net income to owner(s)	Proprietor income ^f	\$52,975	\$1,695,200	100	0.128
	Total value added	\$249,163	\$7,973,216		0.602

a We assumed that there are 32 farmers selling to the MPLS, with 104 employees, with an average of \$414,000 in total sales and \$30,615 in sales to MPLS with intermediaries capturing \$2,590 from these sales. Average per farm expenditures are scaled to create sector totals, such that total outputs (sales) equals total outlays.

b As these are retail purchases, margins are applied. Since the purchased items are known (i.e., fertilizer and chemical inputs), we margin back to the producing sector and account for the local purchasing percentages (LPP).

c As these are retail purchases, margins are applied. Since the purchased items are not specific enough to be attributed to a particular producing sector, we only consider the average margin value for wholesale trade for impact.

d As these are retail purchases, margins are applied. Since the purchased items are known (i.e., fuel), we margin back to the producing sector and account for the local purchasing percentages (LPP).

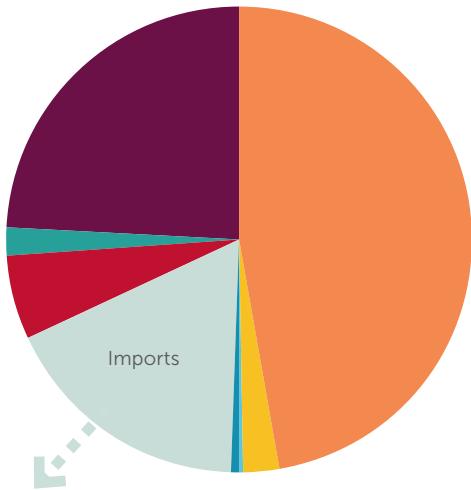
e All business taxes and fees paid to governments, including sales and excise taxes, net of subsidies.

f The remaining balance after computing total outputs (sales) less intermediate input expenditures and other allocations to value added.

Distribution of \$100 in variable costs for farm to school and non-farm to school farm businesses inside and outside of MPLS

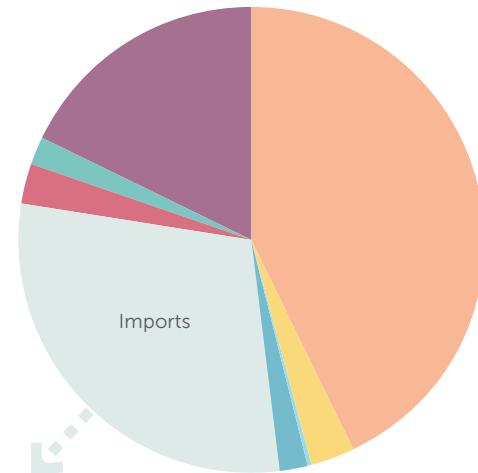
MPLS Farm to School Farms

\$82 Stays in the region **\$18** Leaves the region



MPLS Non-Farm to School Farms

\$70 Stays in the region **\$30** Leaves the region



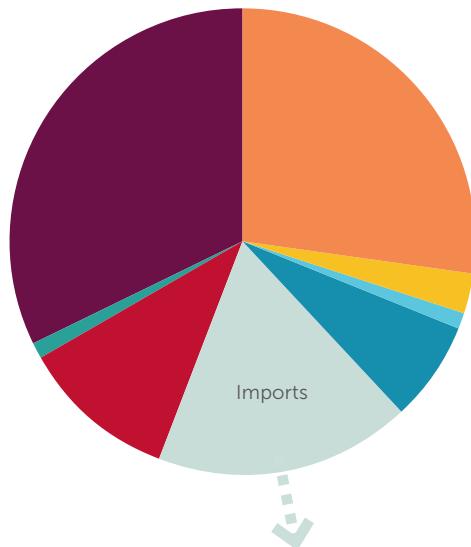
Legend:

- Wages
- Rent and utilities
- Seeds and plants
- Fertilizer and chemicals
- Imports
- Maintenance and repair
- Fuel
- Other expenditures

Distribution of \$100 in variable costs for farm to school and non-farm to school farm businesses inside and outside of Georgia

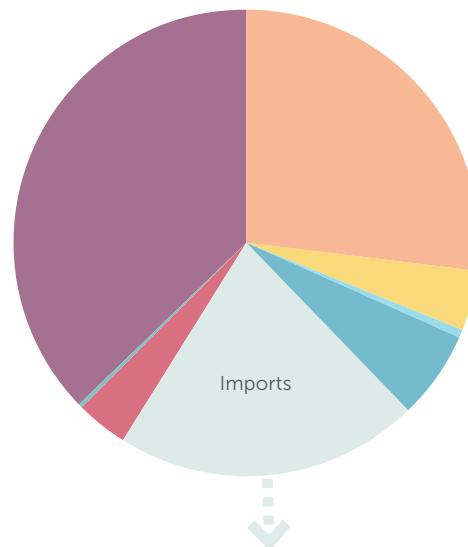
Georgia Farm to School Farms

\$82 Stays in the region **\$18** Leaves the region



Georgia Non-Farm to School Farms

\$79 Stays in the region **\$21** Leaves the region



Using the data points described above, we estimate how much of every \$100 spent on variable costs will stay within the region and how much will leave the region for farm to school farm businesses and non-farm to school businesses. In the MPLS and the Georgia case studies, for every \$100 spent by the farm to school farm businesses on variable costs, \$82 stays within

their regions and \$18 leaves (this is considered leakage). In the MPLS region, for every \$100 spent by the fruit and vegetable farm business \$70 remains in the region and \$30 leaves. In the Georgia region, for every \$100 spent by the fruit and vegetable farm business \$79 remains in the region and \$21 leaves.

Table 4. Average Georgia Farm to School Farm Business Expenditure Profile and Mapping to IMPLAN Categories^a

Expenditure category	IMPLAN category	Per Farm Expenditure	Total Expenditure	LPP	Expense share
Fertilizers	Pesticides and other ag chem mfg (172) - apply margins	\$69,858	\$6,496,794	82.5	0.169
Maintenance and repair	Retail -building material and garden equipment supply stores (399) – apply margins	\$15,381	\$1,430,433	98.1	0.037
Fuel	Petroleum refineries (156) - apply margins	\$14,763	\$1,372,959	1.8	0.036
Rent and utilities	Electric power transmission and distribution (49)	\$14,731	\$1,369,983	97.8	0.036
Seeds and plants	Fruit and vegetable farms (3 and 4)	\$19,640	\$1,826,520	25.1	0.047
Other expenditures		\$78,357	\$7,287,201	varies	0.189
	Total intermediate input purchases	\$212,730	\$19,783,890		0.459
Wages and benefits	Employee compensation	\$80,029	\$7,442,697	100	0.193
Taxes (all)	Tax on production and imports	\$4,699	\$437,007	100	0.011
Interest and depreciation	Other property type income				
Net income to owner(s)	Proprietor income	\$165,875	\$15,426,375	100	0.401
	Total value added	\$250,603	\$23,306,079		0.605

a We make all of the same assumptions as in Table 4. We also assumed that there are 93 farmers selling to the Georgia schools, with 160 employees, with an average of \$463,333 in total sales and \$102,634 in sales to schools with intermediaries capturing \$7,773. Average per farm expenditures are scaled to create sector totals, such that total outputs (sales) equals total outlays.

Table 5 and 6 present an example of the average farm sales profile for the two case studies. Unlike other farm to school economic impact studies, this study recognized that farm to school producers often rely on a variety of markets for their products.

Hence, the model also accounted for intermediate farm to school sales in addition to direct sales. Wholesale transactions have been marginized assuming the 17% IMPLAN default setting.

Table 5. Average MPLS Farm to School Farm Business Sale Profile and Mapping to IMPLAN

Sales category	IMPLAN category	Sales	Share of total sales
Intermediated and wholesale markets	Wholesale trade (395) - apply margins	\$289,140	69.8
Farm to school and institutions	Schools (Aggregated 472-473)	\$29,900	7.2
Direct to consumer	Households	\$94,960	22.9
Total sales		\$414,000	

Table 6. Average Georgia Farm to School Farm Business Sale Profile and Mapping to IMPLAN Categories

Sales category	IMPLAN category	Sales	Share of total sales
Intermediated and wholesale markets	Wholesale trade (395) - apply margins	\$216,233	46.7
Farm to school and institutions	Schools (Aggregated 472-473)	\$61,442	13.3
Direct to consumer	Households	\$185,658	40.1
Total sales		\$463,333	

Constructing the model in IMPLAN

After collecting all the primary and secondary data, these steps were followed to develop the economic impact assessment methodology for this study:

1. Create the model aggregation scheme;
2. Create the farm to school production sector;
3. Customize study area data;

4. Customize industry production;
5. Customize commodity production;
6. Customize trade flows.

For more detailed step-by-step guide to constructing the model (including screen shots), refer to Schmit and Jablonski (2017).

For the purposes of the current study, the fruit and

vegetable sectors (IMPLAN sectors 3 and 4) and K-12 and colleges/universities sectors (IMPLAN sectors 472 and 473) were aggregated.¹⁵ The farm to school production sector was assigned to an IMPLAN sector with no current output; cotton farming (IMPLAN sector 7) in the MPLS model, and sugarcane and sugar beet farming in the Georgia model (IMPLAN sector 8). The study area data was customized by multiplying the information per farm expenditure by the total number of farm to school farms in the study area, creating the regional expenditure for the farm to school production sector (Table 3 and 4). The industry production function was customized, accounting for the margining in the retail and wholesale sectors and the breakdown of the survey expenditures to more specific categories. To account for the opportunity costs of these purchases, new farm to school purchases (Table 5 and 6) (including direct and intermediated, margined for the intermediary mark-up) were subtracted from the total expenditure of the non-farm to school production sector and the wholesale sector. Finally, as stated in the previous section we assumed the IMPLAN local purchasing percentage. As a result, we believe that our customized model is more conservative than models that collect data regarding the location of purchases from local food producers, which have shown in previous studies stronger linkages to their regional economies.

Before performing the impact analysis, it is helpful to review the multipliers of the sectors in the model. A useful comparison is between the farm to school farm production sector and non-farm to school fruit and vegetable production sector. Table 7 includes the generative impacts of the increase in final demand for local food products by schools for MPLS and Georgia along with direct effects and the implied multiplier for each component (total effect divided by direct effect). Results from the model incorporating

the farm to school farm specific data show a gross output multiplier of 1.93 in MPLS and 2.11 in Georgia. For every additional dollar of final demand for farm to school farm products (accounting for no opportunity cost) an additional \$0.93 for related sectors is generated in MPLS and \$1.11 in Georgia. Furthermore, for every additional employee added to the payroll to the farm to school production sector an additional 7.55 jobs are generated in backward-linked industries in the Minneapolis area (employment multiplier = 1.96) and 8.76 jobs in Georgia (employment multiplier = 3.35).

In Georgia, the employment multiplier effects are very strong. While the percent of expenditure for labor is similar for farm to school farms and non-farm to school farms, the linkages with other sectors are different. The direct employment effects of the non-farm to school production sector is 7.84 and the combined indirect and induced effects are 8.02, in contrast the direct effects of the farm to school production sector is 3.73 and the combined indirect and induced effects is 8.76. Recall from the above explanation of economic impact assessments:

$$\begin{aligned} & (\text{direct} + \text{indirect} + \text{induced}) / \text{direct} \\ & = \text{total output multiplier} \end{aligned}$$

In the Georgia case study, every dollar of sales to the farm to school farm sector creates fewer jobs in the immediate production sector and more in the other sectors of the local economy as compared to non-farm to school production sector. Accordingly, we see that the multipliers are larger in both examples for our farm to school production sector, compared to the average fruit and vegetable production sector yet it should be noted that we are working with a very limited number of observations.

¹⁵ These two sectors include only private education including religious schools, online universities, private universities, and private technical training schools. Ideally, we would have obtained financial information from the schools within the study area and modified sectors 472 and 473 to only reflect public education, but this was outside the scope of our study.

Table 7. MPLS and Georgia Multipliers

MPLS			Georgia	
	Non-farm to school fruit and vegetable production sector	Farm to school production sector	Non-farm to school fruit and vegetable production sector	Farm to school production sector
Gross Output	1.62	1.93	1.96	2.11
Employment	1.67	1.96	2.02	3.35
Labor income	1.4	1.72	1.39	1.78

Performing impact analysis

Once the model in IMPLAN was customized to reflect the new farm to school production sector, the economic impact assessment was conducted. If the farmers that sell to schools increase their total output due to increased demand from schools, the expenditures by farm to school producers represents increased demand for inputs from other local sectors, as well as from imports. We also modeled the change in demand for the non-farm to school production sector and the wholesaling sector as a result of the increase in purchases of farm to school farm products. It is only the portion of spending that occurs locally that drives the impact estimates, the rest is non-local purchases and is considered a leakage from the local economy. Analysis by parts allowed researchers to split the impact analysis into more specific parts based on the modelers knowledge of how the first round of local, indirect impacts will occur. In other words, how farmers are spending money on inputs could be estimated based on the increase in sales to the farm to school market.

A scenario was developed for each of the case studies to evaluate the impact that an increase in final demand for local products by schools would have on the functional economic area. This increase in final demand is referred to as the 'shock' – or the direct impact. Secondary data sources including press releases, newspaper articles, the 2013-14 Farm to School Census, the National Farm to School Network website, and farm to school grant and funding information were reviewed to develop the scenarios.

The MPLS case study modeled the impact of a \$25,000 grant from the Center for Prevention at Blue Cross Blue Shield in Minnesota to MPLS. It is assumed that the awarded grant enabled the district to shift some of their non-local food purchases to local food purchases. The impact the shock of \$25,000 on the MPLS regional economy was quantified using an analysis-by-parts approach.

The \$25,000 in farm to school purchases follows the supply chain structure modeled using a combination of primary and secondary data. For this case study, it is assumed that 50% of the sales are directly purchased from the grower, while the remaining 50% of the new sales were purchased through an intermediary.

Thus, the grant of \$25,000 results in \$22,875 worth of purchases from the farm to school production sector, which is allocated to the levels of intermediated purchases and value added outlays necessary to support it, so that \$8,443 is allocated to employee compensation, and \$2,297 to proprietor income. This approach also allows for a 10% mark-up between the price of farm to school as compared to the non-farm to school goods, as it is assumed that the district is spending \$22,875 for the same amount of product that they previously purchased for \$20,750.

Returning to the multiplier equation introduced in the Economic Impact Assessment section, it is estimated:

$$\frac{((\text{new sales to farm to school farms} - \text{lost sales to non-farm to school farms} - \text{lost sales through intermediaries} + \text{gained sales to intermediaries}) + \text{indirect} + \text{induced})}{\text{new sales to farm to school farms}} = \text{total output multiplier}$$

In order to take into account the opportunity cost associated with school's purchases of local food, this study assumes that the school supplanted nonlocal food products with local food products. In other words, in this case study, that as a result of the \$22,875 increase in local food purchases, the school purchased \$20,750 less of nonlocal food products. It is assumed that the school would purchase the same quantity of foods no matter the source, so that the difference in the two amounts is just a reflection in the different percent of product traveling through an intermediary. Here, it is still assumed that 50% of the local product is traveling through the intermediary while 100% of the nonlocal food product travels through an intermediary. According to default data in IMPLAN, the wholesale trade sector (which includes all wholesale food distribution) has a margin of 17%. The loss of these sales to the non-farm to school production sector and the wholesale sector are the opportunity costs. Because this is a regional economic impact model, this study is only concerned with the loss of sales to the non-farm to school farms within

the functional economic area, this is calculated using IMPLAN's LPP 21% for the MPLS non-farm to school production sector. The shift from non-farm to school products to farm to school products would result in a loss of \$4,250 in outlay to the wholesale sector. This loss is in part made up, because based on the survey findings, the model assumes 50% of the sales to the farm to school production sector still goes through an intermediary, resulting in a net loss to the wholesale sector of \$2,125. Table 8 shows the summary of the impact with and without accounting for opportunity costs. Note that countervailing effects are not accounted for in either case study because local foods account for such a small percent of total agricultural production that it is unlikely to be displacing more traditional agricultural commodity production (Swenson 2009).

As illustrated below, when accounting for the opportunity costs, for every additional employee added to the MPLS farm to school production sector's payroll, an additional 0.1 jobs are generated in backward-linked industries (employment multiplier 1.1). Because only \$22,875 of the total grant amount of \$25,000 is going to the farm to school production sector, we estimate that the new labor income

For every additional MPLS farm to school employee, additional 0.1 jobs generated.

Implied output multiplier for MPLS: 1.45

increases by \$11,813, including the \$8,443 of the original output that went towards employment, plus an additional \$3,332 in indirect and induced income. The initial \$25,000 grant results in \$22,875 worth of new sales to farm to school, which in turn generates \$33,204 of output impact when all indirect and induced effects are considered, resulting in an implied multiplier of 1.45.

Table 8. Summary of Impact Results for MPLS Farm to School, With and Without Opportunity Costs

Impact type	Employment	Labor income	Value added	Output
With opportunity costs				
Direct effect	1.00	\$8,443	\$2,297	\$22,875
Indirect effect	0.00	\$48	(\$931)	\$31
Induced effect	0.10	\$3,322	\$5,808	\$10,298
Total effect	1.10	\$11,813	\$7,174	\$33,204
Implied multiplier	1.10	1.40	3.12	1.45
Without opportunity costs				
Direct effect	1.00	\$8,443	\$2,297	\$22,875
Indirect effect	0.10	\$3,655	\$4,880	\$7,742
Induced effect	0.10	\$4,367	\$7,633	\$13,534
Total effect	1.20	\$16,465	\$14,810	\$44,151
Implied multiplier	1.20	1.95	6.45	1.93

The Georgia case study models the impact of a recent grant of \$62,000 to purchase more local foods. Using an analysis-by-parts, the impact the positive shock of \$62,000 will have on the Georgia economy was quantified.

The \$62,000 in farm to school product follows the supply chain structure modeled using a combination of primary and secondary data. It is assumed that 55% of the sales is directly purchased from the grower, while the remaining 45% is purchased through an intermediary. Thus, the grant of \$62,000 results in \$57,257 worth of purchases from the farm to school production sector, which is allocated to the levels

of intermediated purchases and value added outlays necessary to support it, so that \$9,890 is allocated to employee compensation, and \$20,498 to proprietor income.

Again, to account for the opportunity cost associated with the shift in school food purchases, it is assumed that the school supplanted nonlocal food with local food products. As a result of the \$57,257 increase in local food purchases, the school purchased \$51,460 less of nonlocal food products. It is assumed the school would purchase the same quantity of food no matter the source. As this is a regional economic impact model, the study is only concerned with the

loss of sales to non-farm to school farms within the functional economic area, this is calculated using IMPLAN's LPP 25% for Georgia non-farm to school production sector. The shift from nonlocal to local food products would result in a loss of \$10,540 in output to the wholesale sector. This loss is in part made up, because based on survey findings, the model assumes 45% of the sales to the farm to school production sector still goes through an intermediary, resulting in a net loss to the wholesale sector of \$5,797. Table 9 shows the summary of the impact with and without accounting for opportunity costs.

As illustrated below, when accounting for the opportunity costs, for every additional employee

For every additional Georgia farm to school employee, additional 0.5 jobs generated.

Implied output multiplier for Georgia: 1.48

added to the farm to school production sector's payroll, an additional 0.5 jobs are generated in backward-linked industries (employment multiplier 1.5). The initial \$62,000 grant, results in \$57,275 worth of new sales to farm to school farms, generating over \$84,581 of output impact when all indirect and induced effects are considered, resulting in an implied multiplier of 1.48.

Table 9. Summary of Impact Results for Georgia Farm to School, With and Without Opportunity Costs

Impact type	Employment	Labor income	Value added	Output
With opportunity costs				
Direct effect	1.00	\$9,890	\$20,498	\$57,275
Indirect effect	0.20	(\$3,879)	(\$1,448)	\$3,622
Induced effect	0.30	\$7,739	\$13,715	\$23,684
Total effect	1.50	\$13,750	\$32,765	\$84,581
Implied multiplier	1.50	1.39	1.60	1.48
Without opportunity costs				
Direct effect	1.00	\$9,890	\$20,498	\$57,275
Indirect effect	0.20	\$11,294	\$16,245	\$26,501
Induced effect	0.30	\$12,134	\$21,497	\$37,124
Total effect	1.50	\$33,318	\$58,240	\$120,900
Implied multiplier	1.50	3.37	2.84	2.11

Discussion



Discussion

This study investigated and evaluated the economic impacts of farm to school, and the unique attributes of farm to school procurement, including how the structure of the farm to school supply chain is shifting from direct to more intermediated transactions. Our findings have important implications for future research into the economic impact assessments of farm to school procurement.

A thorough review of previously conducted economic impact studies of farm to school local food procurement was conducted, highlighting significant differences and inconsistencies in approach and rigor. A customized approach for data collection and modeling was designed and used to elaborate understanding of how school districts procure local foods and how the structure of these supply chains change participating farms' inter-industry interactions, using two case studies - Minneapolis Public Schools and the state of Georgia. This study illustrated an approach utilizing primary and secondary data to determine reasonable definitions of regions

Farm to school farms purchase more inputs from the local economy per unit of output, which results in positive local economic impact.

for analysis, the size of the farm to school sector, modification of the production functions of farms selling to schools, and appropriate shocks. Noting our small sample sizes for both sites, the study found that the multiplier impacts for the farm to school farm sector are larger than the more traditional fruit and vegetable farm sectors, indicating that farm to school farms purchase more inputs from the local

economy per unit of output, which results in positive local economic impacts. The multiplier calculated for the Georgia case study, excluding countervailing and opportunity costs, was higher than those reported in previous farm to school economic impact assessments. This could be attributable to the large functional economic area. After accounting for the countervailing effect and opportunity costs, the MPLS case study and the Georgia case study had multipliers of 1.45 and 1.48 respectively, in line with previous farm to school economic assessment. The impact of the countervailing effect and opportunity costs in the Georgia case study is the result of the structure of the supply chain. As more of the farm to school products travel directly from farm to school, a shift in purchases from non-farm to school to farm to school products results in larger associated opportunity costs.

As part of this study, a widely adaptable survey protocol for future studies and illustrated how to map survey responses to IMPLAN sector categories was developed. This is the first study attempt to more accurately customize the farm to school production sector using primary data while taking into account the changing ways in which farm to school product is getting to schools. This survey instrument is a valuable first step for communities, school districts, and others interested in evaluating the economic impacts farm to school procurement and is available at the end of this report. However, in this study, researchers encountered a significant challenge in the implementation of this survey protocol, which is worth discussing. Lead researchers sought to enroll volunteer enumerators with strong relationships with producers to allay any potential concerns about participating in the survey, but were not able to provide financial compensation for their time

Photo on previous page: Northeast Iowa Food and Fitness Initiative



Credit: National Farm to School Network

in the surveying effort. Without this and/or buy in from their supervisors, volunteers had little incentive to invest the time and effort necessary to conduct this type of primary data collection for the study. For future studies, enumerators should be provided financial compensation for survey implementation and/or respondent producers, or surveys should be conducted in communities where the research team already has strong relationships with producers to be able to elicit prompt and complete responses. If this barrier is appropriately addressed, farm to school stakeholders across the country can begin to use this survey tool to collect standardized data that would allow for comparisons across geography of both the farm to school farm expenditure profile as well as the percent of sales that are traveling direct from

producers versus through intermediaries. The CSU team was awarded a 2017 USDA NIFA grant to build off the findings from this study, to assess the impacts of farm to school programs on farmers and food supply chain business, household consumption patterns, and school food choice. To find out more about the study visit our website <http://foodsystems.colostate.edu/research/farm-to-school/>.

Through the primary data collection for this study, researchers found that local food sales to schools travel through intermediaries, which poses new challenges for studying farm to school economic impact, as some producers are not aware of what markets their product is sold in. As indicated by 2013-14 USDA Farm to School Census open-ended responses cited in the introduction, this also

seems to hold true for school buyers. Some regions are considering developing their own inventory management tools, so that schools have a better sense of the total value of their local food purchases as well as the different sources. There are also discussions happening regarding how the next Farm to School Census can ask questions to better capture the changing structure of the farm to school supply chain.

No matter what the supply chain structure, it is important to note that though implementing local food procurement programs in schools may create new market opportunities for some farms, it also displaces non-farm to school product purchases by schools impacting other producers as well as intermediaries. These countervailing effects and opportunity costs need to be accounted for in rigorous economic impact assessments. The IMPLAN model and guidance presented aims to guide farm to school stakeholders in accurately accounting for the changing farm to school supply chain in economic impact assessment and thus produce more accurate data on the true impact of farm to school procurement. Further, the countervailing effects and opportunity costs may have important consequences when considering the stated goals of farm to school. If, for example, the goal of farm to school is to strengthen local and regional economies, then the findings herein could suggest that there is an advantage to sourcing through intermediaries. However, if the goal of farm to school is to increase economic viability of small and medium sized producers, further investigation is needed into the relationship between farm profitability and supply chain structure.

Economic impact data is valuable in engaging new and diverse stakeholders in farm to school initiatives. Engaging producers in farm to school activities can be challenging and may be an initial barrier to local procurement for schools. Growing an evidence base around the economic benefits of selling to schools is an opportunity to increase engagement of

farmers and farmer focused organizations, potentially increasing farmer participation and bolstering the local food supply available to schools. Economic data is also valuable in speaking to federal, state, and local agencies, and private investment and funding entities. Positive economic outcomes offer justification and support for investment in local food purchasing and infrastructure support that facilitates increased spending on local food. Both community level infrastructure (e.g., aggregation and processing facilities and transportation) and school/district level infrastructure (e.g., equipment and capacity for processing and production) must be in place for local procurement to be feasible and sustainable. Both public and private investments in infrastructure are vital for local procurement opportunities to grow to scale and achieve the economic impact and viability demonstrated in the two case studies highlighted in this report.

The economic impacts of farm to school will continue to be a topic of interest for researchers, farm to school stakeholders, and decision makers, and the authors hope that this study has sparked a deeper understanding of the challenges and opportunities. The preliminary results from the two case studies strengthen the call for farm to school stakeholders, with strong relationships to local producers, to use the methodology framed in this report to conduct additional assessments evaluating the economic impacts of farm to school procurement, so that we may compare case studies in different locations, involving different commodities, scales, and numbers of producers, and relying on different supply chains. The survey protocol and methodology developed for this study can support more rigorous and comparable economic impact assessments of farm to school moving forward and thus fill an important gap in knowledge and open new opportunities for farm to school implementation and advocacy.

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Appendix 1. Farmer Survey Protocol

Q1.1 Survey enumerator name:

Q1.2 The National Farm School Network (NFSN) is collaborating with researchers from Colorado State University (CSU) to conduct a study of the economic impact of farm to school programs. The research aims to understand how selling to the school food market impacts farm sales and profitability. During this survey, we will ask you questions to better understand the nature of your business and any changes you might have made since selling to schools. We do not anticipate any risks from participating in this research. No farm specific information will be shared with anyone outside of the Colorado State University-led research team without your permission. We will hold all information about your farm in strict confidence. The information will only be released in an aggregated format where individual farm information cannot be identified. We may quote your responses to open-ended questions, but your identity will not be associated with any quotes. Please be assured that we are committed to the strictest standards of confidentiality. If you have any questions, please feel free to call or email the Principal Investigator or Project Manager at any time.

If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 970-491-1553 or access their website at <https://vprnet.research.colostate.edu/RICRO/irb/>.

Q1.3 If you agree to participate in the study, please provide your name, farm name, telephone, email below and zip code where your primary farm is located.

Name (1)

Farm (2)

Phone (3)

Email (4)

Zip code where your primary farm is located (5)

Q2.1 Why did you/your farm decide to sell product to schools?

Q2.2 What impact(s) has selling to schools had on your business?

Q3.1 What is the name of the school district(s) to which you sell products? Please include city and state.

District 1 (1)

District 2 (2)

District 3 (3)

District 4 (4)

District 5 (5)

District 6 (6)

District 7 (7)

Q3.2 In what year did you start selling to schools (e.g., k-12, preschool, early care and education facility, etc.)?

Year (1)

Q3.3 In 2016, which of the following products did you produce on your farm? Please check all that apply.

- Fruit (1)
- Vegetable (2)
- Dairy (3)
- Grain (4)
- Beef (5)
- Hogs, pigs, sheep, goats, other livestock (meat or dairy), honey (6)
- Chickens, broilers, turkey, duck, and eggs (7)
- Other (8) _____

Q3.4 In 2016, did your farm utilize any season extension techniques (e.g., greenhouse, high-tunnels, hoop-house, etc.)?

- Yes (1) _____
- No (2) _____

Display This Question:

If In 2016, did your farm utilize any season extension techniques (e.g., greenhouse, high-tunnels, hoop-house, etc.)? Yes Is Selected

Q3.5 Do you sell these products to schools? In other words, did participation in farm to school stimulate interest in or ability to utilize season extension techniques?

- Yes (1) _____
- No (2) _____

Q3.6 How many acres did you cultivate:

When you started selling to schools: (1)

In 2016: (2)

Q3.7 Did participation in farm to school stimulate changes in the amount of cultivated acreage?

- Yes (1) _____
- No (2) _____

Q3.8 Which of the following farm to school activities did you engage in during 2016?

- Sold locally produced foods to be served in the cafeteria. (1)
- Participated in farmer in the classroom sessions/cooking demonstrations of locally produced foods in the cafeteria, classroom or other school-related setting (2)
- Hosted student field trips to your farm/business (3)

- Provided school with marketing/promotional materials about your farm (4)
- Donated product to school for sample or tasting for free or at a reduced price (5)
- Worked with school/district staff to develop a specific food product using local foods (6)
- Were there any I did not mention (please specify): (7) _____

Display This Question:

If Please check the farm to school activities that you engaged in during 2016. Please check all that... Participated in farmer in the classroom sessions/cooking demonstrations of locally produced foods in the cafeteria, classroom or other school-related setting Is Selected

Or Please check the farm to school activities that you engaged in during 2016. Please check all that... Hosted student field trips to your farm/business Is Selected

Q3.9 Which (if any) of the below themes did you cover with the students as part of your classroom and/or field trip engagement?

- Life on a farm (1)
- Lessons on specific produce (what is this? Why is it good for me?) (2)
- How food gets from the farm to the plate (3)
- The importance of farms to the environment (4)
- Were there any I did not mention (please specify): (5) _____

Q4.0 Please check all of the markets that your farm or ranch used in 2016. Please make sure to select one or more channel.

- K-12 School
- Farmers market
- On-farm store or farm stand
- Community Supported Agriculture (CSA)
- Online market place
- Pick your own
- Supermarket or supercenter
- Restaurant or caterer
- Other retail store (independently owned grocery store, food cooperative, small food store, corner store, etc.)
- Local or regional aggregator, distributor, food hub, or broker
- Local or regional food processor or food manufacturer
- College or university
- Preschool or early care and education facility
- Hospital
- Other institution (corporate cafeteria, prison, food bank, senior care facility, etc.)
- Wholesale marketplace for commodities not identified by source (auction, wholesale or terminal market, etc.)

Q4.1 What percent of your 2016 farm sales came from each of the sales channels listed below? (total must equal 100)

- _____ Direct to farm to school (including k-12 and pre-k/early care and education sites) (1)
- _____ Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) (2)
- _____ Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) (3)
- _____ Institution (e.g., college or university; hospital) (4)
- _____ Wholesale marketplace for commodities not identified by source (auction, wholesale or terminal market, etc). (5)

Q4.2 Specifically, which of the following markets did your farm or ranch use in 2017? (please check all that apply)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to farm to school (including K-12 and pre-K/early care and education sites) Is Greater Than 0

- Direct to k-12 schools (1)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to farm to school (including K-12 and pre-K/early care and education sites) Is Greater Than 0

- Direct to preschool or early care and education facilities (2)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) Is Greater Than 0

- Farmers' markets (3)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) Is Greater Than 0

- On-farm store or farm stands (4)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) Is Greater Than 0

- Community Supported Agriculture (CSA) (5)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) Is Greater Than 0

- Online market place (6)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Direct to individual consumer (e.g., farmers' market; on-farm store or farm stand; CSA; online market place; pick your own) Is Greater Than 0

- Pick Your Own (7)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Supermarkets or supercenters (8)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Restaurants or caterers (9)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Other retail stores (independently owned grocery store, food cooperative, small food store, corner store, etc.) (10)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Local or regional food processors or food manufacturers (11)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Distributors (12)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Food buying cooperatives (13)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Food hubs (14)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- Food service management companies (15)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- DoD Fresh Program Vendors (16)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- USDA Foods (17)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Intermediated market (e.g., supermarket or super center; restaurant or caterer; other retail store; local or regional food processor or food maker; or local or regional aggregator, distributor, food hub, or broker) Is Greater Than 0

- State farm to school program office (18)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Institution (e.g., college or university; hospital) Is Greater Than 0

- Colleges or universities (19)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Institution (e.g., college or university; hospital) Is Greater Than 0

- Hospitals (20)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Institution (e.g., college or university; hospital) Is Greater Than 0

- Other institutions (corporate cafeteria, prison, food bank, senior care facility, etc.) (21)

If What percent of your 2016 farm sales came from each of the sales channels listed below? (total mu... Wholesale marketplace for commodities not identified by source (auction, wholesale or terminal market, etc). Is Greater Than 0

- Wholesale marketplaces for commodities not identified by source (auction, wholesale or terminal market, etc). (22)

Display This Question:

If Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) Food hubs Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) Distributors Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) Food buying cooperatives Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) Food service management companies Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) DoD Fresh Program Vendors Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) USDA Foods Is Selected

Or Please check all of the markets that your farm or ranch used in 2016. (please check all that apply) State farm to school program office Is Selected

Q4.3 Does any of the product you sell through intermediaries end up at schools? If yes, what percent of your total intermediated sales goes to schools?

- Yes (1) _____
- No (2) _____
- Don't know (3) _____

Q4.4 Please tell us a bit more about your 2015 sales.

TOTAL 2015 Sales (including all sales) (1)

2015 sales to schools (k-12 or pre-school) (2)

Q4.5 What was your level of satisfaction (very unsatisfied, unsatisfied, neutral, satisfied, or very satisfied) with the following aspects of your farm to school sales?

	very unsatisfied (1)	unsatisfied (2)	neutral (3)	satisfied (4)	very satisfied (5)
Prices paid (1)					
Volume of sales (2)					
Ordering reliability (3)					
Time commitment (4)					
Delivery requirements (6)					
Delivery logistics (5)					
Reliable payment (7)					
Ease of communication with schools (9)					
Overall profitability (8)					

Q4.6 When your farm started to sell to schools, how did it affect your production for and/or sales to other markets? (please check all that apply)

- We increased production to accommodate school sales (1)
- We decreased sales to one or multiple direct markets (e.g., farmers' markets, CSA, farm stand, etc.) (2)
- We lacked adequate market access for our firsts (e.g., highest quality products) before selling to schools (3)
- We lacked adequate market access for our seconds (e.g., farm to school create an opportunity to sell our seconds/imperfect products) before selling to schools (4)

- We were a new/beginning farm without pre-existing markets when we started selling to schools (5)
- We started selling at schools so long ago that I can't remember (6)
- Other (7) _____

Q4.7 Do you plan to continue selling to schools in the future?

- Yes (1) _____
- Maybe/Unsure (2) _____
- No (3) _____

Q5.1 What were your total farm product sales and operating expenses for 2016 (January 1-December 31).

Total farm product sales (1)

Total farm operating expenses (2)

Q5.2 In 2016, approximately what percent of your farm or ranch's total expenditures were devoted to the following categories?
(the sum of these expenses should not equal more than 100%)

- _____ Labor (according to the USDA the average labor expenses were 12% of total expenses) (1)
- _____ Fertilizers and chemicals (average expenses were 11%) (2)
- _____ Maintenance and repair (average expenses were 14%) (3)
- _____ Fuel and oil (average expenses were 12%) (4)
- _____ Rent and utilities (average expenses were 9%) (5)
- _____ Seeds and plants (average expenses were 8%) (6)

Q6.1 Thank you for your participation in this research!



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