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Local Food Procurement Pathways: Key Drivers of Farm to School Participating Authorities Buying Directly From Farmers

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Abstract

Farm to School (F2S) programs are a widely adopted component of U.S. school food systems, with 74 percent of school food authorities (SFAs) participating in at least one F2S activity during the 2022–2023 school year. Total local food purchases by SFAs reached \$1.8 billion during the 2022–2023 school year, highlighting F2S as an important source of demand for regional producers. This report draws on nationwide USDA, Food and Nutrition Administration surveys to examine how SFAs engaged in F2S programs source local foods, and to identify institutional and infrastructural factors influencing procurement sourcing decisions. Findings show that rural and smaller SFAs, along with those demonstrating higher levels of engagement and experience, are significantly more likely to purchase directly from producers or through direct marketing channels. Direct procurement is associated with access to local food infrastructure, such as farmers markets and refrigerated warehouses, as well as with reported challenges like product availability and staffing capacity. External support, including grant funding and part-time F2S staffing, is linked to increased likelihood of direct sourcing from producers. These results highlight opportunities to strengthen direct purchasing at SFAs through targeted support, while also indicating that regional conditions play a key role in shaping the feasibility of direct sourcing of local foods.

Keywords: local food, direct sales, direct marketing, farm to school

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A report summary from the Economic Research Service

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Key Points

- Farm to school (F2S) programs can connect local food producers and educational institutions with the objectives of promoting better nutrition for students, engaging local communities, and providing economic opportunities for farmers.
- School food authorities (SFAs) that participated in F2S activities (e.g., having a school garden, serving local foods, conducting field trips to farms) reported spending \$1.8 billion on local foods during the 2022–2023 school year.
- During 2022–2023, 74.1 percent of SFAs participated in at least one F2S activity. Of participating SFAs, 63 percent procured local foods to serve in school meals.
- Nearly two-thirds of SFAs reported procuring local food from Government programs such as the USDA Department of Defense Fresh Fruit and Vegetable Program (USDA DoD Fresh) and USDA Foods. About 25 percent of SFAs procured local food directly from individual producers.
- Rural and more experienced SFAs, as well as SFAs that participated in more F2S program activities, are more likely to procure local foods directly from individual producers.
- Higher shares of direct-to-consumer producers and higher densities of farmers markets, meat processing facilities, and refrigerated warehouses in a SFA's State were associated with a higher likelihood of purchasing food directly from individual producers and direct marketing channels.
- Most SFAs reported facing challenges in procuring local foods. Over 42 percent of SFA faced challenges with local food availability, citing limited supply (30.8 percent), lack of access through primary vendors (16.9 percent), difficulty identifying local producers or distributors (15.9 percent), limited access to precut or processed products (14.1 percent), and lack of product variety (14 percent).
- During the 2022–2023 school year, approximately one quarter of SFAs increased their purchases of local foods in response to supply chain challenges.

Why Does This Matter?

F2S has become the most commonly enacted subnational food policy in the United States, reflecting growing interest in supporting both child nutrition and domestic agricultural markets. School food markets have drawn attention in part because evidence suggests that direct marketing channels can support positive financial outcomes for farms,

particularly small- and mid-scale operations and those with beginning farmers and ranchers. These farms often face higher per-unit production costs and have limited ability to compete on economies of scale, making access to differentiated markets especially important. At the same time, research indicates that intermediated markets—or

participation in a mix of direct-to-consumer and intermediated channels—may be more strongly associated with positive farm outcomes than direct markets alone. This suggests that the structure of the supply chains schools use for F2S procurement may shape how participation in these markets affects producers.

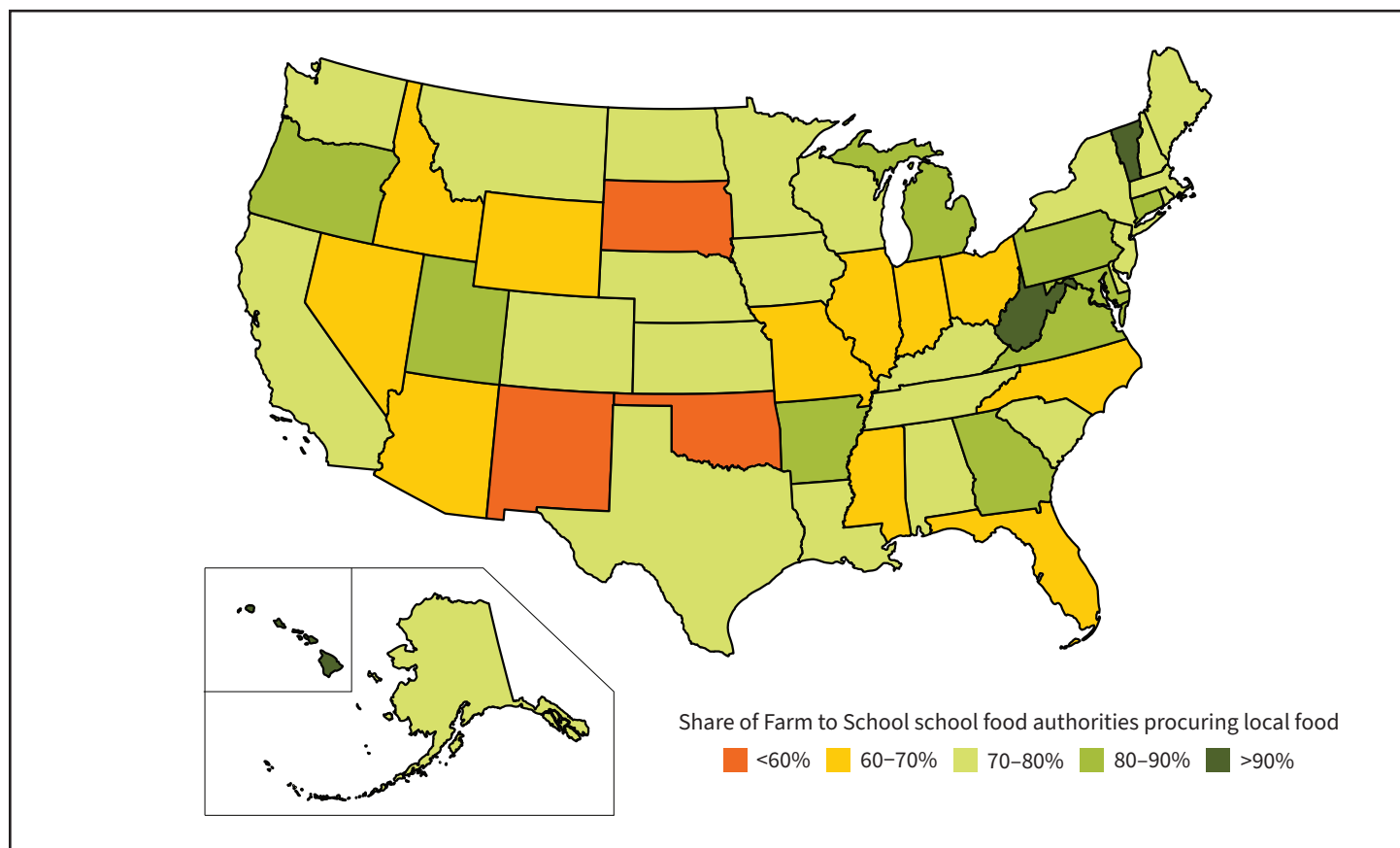
This report provides an overview of F2S local food procurement activities, highlighting how SFAs fund and source local food. It analyzes the effects of SFA characteristics, local food infrastructure/environment variables, and intensity of participation in F2S programs on the probability of purchasing local foods from direct sources. Other topics covered are the prevalence of local food procurement challenges and the responses of SFAs to these challenges. The results could help industry shareholders understand the roadblocks to greater participation in F2S programs.

A Few More Details

We used data from the USDA, Food and Nutrition Administration (FNA) 2023 Farm to School Census and 2022 and 2023 USDA, FNA Surveys on School Food Supply Chain Disruption and Student Participation to provide a summary of procurement and funding sources, challenges, and mechanisms for SFAs purchasing local foods. We used a logistic regression model to examine the factors associated with SFAs sourcing local foods directly from individual food producers and, more broadly, from direct marketing channels.

The U.S. map shows the share of F2S SFAs that procured local food in the 2022–2023 school year. In most States, between 60 and 80 percent of participating SFAs reported buying local food for school meals. States that fell below this threshold were New Mexico, Oklahoma, and South Dakota. Hawaii, Vermont, and West Virginia were above the 60–80 percent threshold.

Share of school food authorities participating in Farm to School activities that procured local food, by State



Source: USDA, Economic Research Service, using data from the USDA, Food and Nutrition Administration 2023 Farm to School Census.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

Local Food Procurement Pathways: Key Drivers of Farm to School Participating Authorities Buying Directly From Farmers

Introduction

Farm to School (F2S) programs facilitate connections between educational institutions and local agricultural producers to incorporate locally sourced foods into school cafeterias and curricula. F2S does not refer to a single, standardized program. Instead, it encompasses a diverse range of activities centered on local food and agricultural engagement. These activities include serving locally grown foods in school meals, promoting local products, offering agricultural education, maintaining school gardens, hosting farm field trips, and integrating food and nutrition topics into the curriculum. F2S programs support the U.S. Department of Agriculture’s mission by promoting agricultural sustainability, enhancing food security, and improving child nutrition.

F2S programs represent an increasingly important demand channel for farmers participating in direct marketing systems. According to the latest USDA, Food and Nutrition Administration (FNA)-sponsored report (Machata et al., 2024), local foods made up nearly 20 percent of total food purchases by participating SFAs during the 2022–2023 school year. These SFAs spent an estimated \$1.76 billion on locally sourced foods in school year 2022–2023, up from \$1.26 billion in the 2018–2019 school year, underscoring the growing scale and economic relevance of F2S programs. However, due to the broad flexibility in how F2S programs are designed and the variety of Federal, State, and local entities that govern, fund, and implement them (see appendix A), understanding local procurement practices and identifying the drivers and constraints behind these decisions remains a complex undertaking.

Schools procure local foods through both direct and indirect sources, including individual producers, USDA procurement programs, and regional distributors. Research indicates that selling through direct marketing channels, such as farmers markets, community-supported agriculture, or direct-to-institution (e.g., to schools, prisons, etc.), can yield greater financial returns for producers, particularly small- and mid-scale operations and those with beginning farmers and ranchers (Bauman et al., 2018; Park et al., 2014). These farms often face higher per-unit production costs and have limited ability to compete on economies of scale, making access to differentiated markets especially important. As a result, they may depend more heavily on opportunities to differentiate their products and participate in markets that reward those attributes. At the same time, within these direct marketing channels, research suggests farmers selling through both direct-to-consumer (DTC) and intermediated markets (e.g. direct-to-institution) have higher earnings than farmers who sell only through DTC channels (Bauman et al., 2018; Park et al., 2014). These findings suggest that when SFAs engage in direct purchasing, producers may experience economic advantages. As such, the structure of the supply chains schools use for F2S procurement may shape how participation in these markets affects producers, and examining the factors that influence schools’ decisions may offer insights into potential producer benefits.

This report offers a comprehensive examination of local food procurement in F2S programs, with a particular focus on the factors that influence procurement through direct marketing channels. Using nationwide USDA, FNA survey data, alongside supplementary data sources, detailed in the Data Description section, we present stylized facts about program participation, procurement practices, and

the operational and structural challenges faced by SFAs participating in F2S programs. We then employ logistic regression modeling to explore how SFA characteristics and local food infrastructure indicators relate to procurement choices, especially those involving direct marketing channels such as food hubs and producer cooperatives. By bridging empirical data with policy-relevant insights, this report aims to enhance our understanding of the mechanisms underpinning F2S procurement of local foods.

Data Description

In this report, we primarily utilized two datasets sponsored and collected by USDA, FNA: The 2023 Farm to School (F2S) Census and the 2021–23 Supply Chain Disruptions Surveys. We also collected additional local food metrics to complete our analysis which are described in this section.

2023 Farm to School (F2S) Census

USDA, FNA conducts a periodic nationwide Farm to School Census (F2S Census) to better understand farm to school efforts around the country and to measure progress and changes nationwide. The inaugural Farm to School Census was conducted in 2013 and included questions on participation in farm to school activities in school year 2011–2012. The survey was designed to serve as a baseline for comparing USDA F2S programs over time. The Farm to School Census was repeated in 2015, 2019, and most recently in 2023, the latter of which collected data on the 2022–2023 school year. This report analyzes data from the 2023 F2S Census only.¹

A school food authority (SFA) is the unit surveyed in the Farm to School Census. According to the Code of Federal Regulations, a SFA is “the governing body that is responsible for the administration of school food for one or more schools; and has the legal authority to operate the National School Lunch Program therein or is otherwise approved by (USDA) FNS to operate the program” (Code of Federal Regulations, 2026). SFAs are often, but not always, school districts. USDA, FNA characterizes SFAs by size, location on the urban-rural continuum, percentage of students eligible for free or reduced-price lunch, and years of F2S participation. USDA, FNA uses data on these SFA characteristics to determine if there are discrepancies across subgroups in F2S participation and implementation.

USDA, FNA invited all SFAs that participated in the National School Lunch Program in the 2022–2023 school year to complete the 2023 Farm to School Census. Of the 18,833 SFAs invited to respond to the 2023 Census, a total of 12,559 SFAs submitted responses, resulting in a total response rate of 67 percent. The restricted-access dataset used for this analysis contains responses from 11,803 of the 12,559 SFAs that submitted responses based on inclusion criteria detailed in Machata et al. (2024). The respondents included public, private, and charter SFAs, as well as residential childcare institutions² (RCCIs) participating in the National School Lunch Program in the 50 States, U.S. territories, and Washington, DC.

In the F2S Census, the F2S activities included are in five categories: (1) serving local foods, (2) promotion of local foods, (3) agriculture education and edible school gardens, (4) food sourcing and procure-

¹ Survey questions and the populations included in the Farm to School Censuses vary across years. See Machata et al. (2024) for a detailed discussion of the limitations of longitudinal analysis.

² Residential child-care institutions include any distinct part of a public or nonprofit private institution that maintains children in residence, operates principally for the care of children, and, if private, is licensed by the State or local government to provide residential child-care services under the appropriate licensing code by the State or a subordinate level of government (Idaho School Nutrition, N.D.).

ment, and (5) others. Table 1 summarizes all F2S activities by category. The SFA is categorized as a F2S SFA if they report any activity in the list. In alignment with USDA, FNA's definition in Machata et al. (2024), we define SFAs that participated in at least one F2S activity during the 2022–2023 school year as a F2S SFA.

Table 1

Farm to school activities by category

Serving local foods	Promotion of local foods
• Use local foods in any form in Child and Adult Food Program (CACFP) At-Risk Afterschool (snacks and/or supper) • Use local foods in any form (fresh, frozen, dried) in the National School Lunch Program (NSLP) • Use local foods in any form as part of the Fresh Fruit and Vegetable Program (FFVP) • Use local foods in any form in CACFP meals • Use local foods in any form in summer meals (i.e., Summer Food Service Program (SFSP) or Seamless Summer Option (SSO)) • Use local foods in any form in the School Breakfast Program (SBP) • Serve local foods in any form in the NSLP After School Snack Service • Serve local foods in a school salad bar • Serve local food in any other way • Grow or serve local foods that are culturally relevant to students	• Implement strategies to encourage student selection and consumption of local foods • Promote local foods at school (e.g., via cafeteria signs, posters, newsletters) • Promote local foods through themed or branded promotions • Use cafeteria food coaches to promote the consumption of local foods • Celebrate National Farm to School Month (October) • Generate media coverage of local foods being used in schools • Host special local food events in summer meals (i.e., SFSP or SSO) • Host farm to school related family and community events • Host special local foods events in CACFP
Agricultural education and edible school gardens	Food sourcing and procurement
• Expose students to agricultural-related careers • Integrate farm to school activities in curriculum • Conduct student field trips to farms, farmers markets, producers, or processors • Hold taste tests or cooking demonstrations of local or edible school garden-grown foods • Have any type of edible school garden • Have farmer(s) visit the cafeteria, classroom, or other school-related setting • Use USDA Team Nutrition materials as part of taste testing or other educational activities	• Source local foods from USDA DoD Fresh • Search for local vendors, farmers, food hubs, or cooperatives to procure local foods • Forecast budgetary needs for local purchases • Includes value statements in procurement documents • Indicates a geographic preference in procurement documents • Work with local food producers to develop specific food products using local foods
Others	
• Provide training to school food service staff related to farm to school activities • Collect food waste for composting • Evaluate the impact of farm to school activities	

Source: USDA, Economic Research Service using information from table 8 in R. Machata, L. Jennings, H. Morrison, and M. Boyle, 2023 Farm to School Census Report, 2024, U.S. Department of Agriculture, Food and Nutrition Administration.

As part of the 2023 F2S Census contract, USDA, FNA sponsored a report by Machata et al. (2024) that documents key findings from the census, which includes detailed information on the survey methodology, data collection procedures, and data analysis tables. This report does not replicate the scope of Machata et al. (2024) but instead offers supplementary analysis focused specifically on the direct procurement of local food. This analysis draws on the 2023 census data and incorporates additional data sources to explore a distinct dimension of the research questions. Summary statistics relevant to local food procurement are presented here. For a comprehensive analysis of all 2023 F2S Census items, readers are encouraged to consult Machata et al. (2024).

2021–2022 and 2022–2023 School Food Authority (SFA) Supply Chain Disruption Surveys

The early years of the Coronavirus (COVID-19) pandemic witnessed supply chain challenges across the United States and the world. We use USDA, FNA’s 2021–2022 and 2022–2023 School Food Authority Surveys on Supply Chain Disruptions³ (hereafter referred to as the SFA Supply Chain Disruptions Surveys) to analyze changes in local food procurement during that period. While the F2S Census asks about challenges in local food procurement, the SFA Supply Chain Disruptions surveys ask additional questions about changes in SFA procurement choices and the drivers for these changes. As such, this data allows us to provide a complementary and more detailed analysis.

In November–December 2021 and again in November 2022–January 2023, USDA, FNA conducted surveys on supply chain disruptions to assess the prevalence and extent of supply chain challenges among SFAs that operated Child Nutrition Programs during the 2021–2022 and 2022–2023 school years, respectively. Because not all SFAs responded to the survey, we applied weights provided by USDA, FNA to the data to make the results nationally representative. The surveys included questions on, among other things, challenges procuring specific food products and non-food supplies and equipment, the underlying factors driving the supply chain challenges and the consequent impacts on school food program participation and operation, methods SFAs were using to address the challenges, and staffing shortages. The survey instruments and details of the weighting methodology can be found in USDA, FNA (2022a; 2023d).

The SFA Supply Chain Disruptions Surveys classify SFAs by size and urbanicity using the same definitions as the 2019 F2S Census. When analyzing by urbanicity, we aggregated the classifications to rural and non-rural (either towns, suburban areas, or urban areas). For more information, please see USDA, FNA (2022a).

The total number of responses to the SFA Supply Chain Disruptions Surveys in the 2021–2022 was 11,295 SFAs (that is, 11,295 SFAs completed at least 50 percent of the survey) and the total in the 2022–2023 school year was 14,301. Table 2 provides a breakdown of the two surveys by SFA size and urbanicity. Most SFAs in the responses are small or medium in size, and rural SFAs make up roughly three quarters of both samples.

³ The 2021–2022 survey was called the School Food Authority Survey on Supply Chain Disruption, while the 2022–2023 survey was called the SFA Survey II on Supply Chain Disruption and Student Participation. We refer to both surveys as the SFA Supply Chain Disruptions Surveys.

Table 2

Supply chain survey response and population size by school food authority (SFA) size and urbanicity, un-weighted, 2021–2022 and 2022–2023

	2021–2022		2022–2023	
	Population N	Response N	Population N	Response N
SFA size				
Small (1–999 students)	10,982	6,246	11,203	8,200
Medium (1,000–4,999)	5,438	3,661	5,534	4,372
Large (5,000–24,999)	1,700	1,186	1,712	1,284
Very large (25,000+)	292	202	286	214
Total	18,412	11,295	18,735	14,070
Urbanicity				
Rural	12,421	8,038	12,315	9,672
Urban	6,695	3,135	6,285	4,232
Total	19,116	11,173	18,600	13,904

Note: Some SFAs exclude an urbanicity designation because the Zip Code Tabulation Areas that are used to classify by urbanicity are updated infrequently. Consequently, some SFA zip codes lack an urbanicity classification.

Source: USDA, Economic Research Service using data from the USDA, Food and Nutrition Administration 2021–23 SFA Supply Chain Disruptions Surveys.

Metrics of Local Food Infrastructure

We incorporate indicators of local food infrastructure in the areas where SFAs operate into the regression model used to identify key drivers of local food procurement sources. To assess the robustness of the local food environment and its supporting infrastructure at both county and State levels, we include measures such as the number of farmers markets, food hubs, refrigerated storage warehouses, and meat processing facilities. We also factor in the share of farms selling through direct-to-consumer and intermediate marketing channels.

We sourced data for these indicators from the USDA, Agricultural Marketing Service’s (AMS) Farmers Market and Food Hub Directories (Local Food Economics, N.D.); the USDA, National Agricultural Statistics Service’s (NASS) biennial report on refrigerated warehouse capacity (USDA, NASS, 2024); the USDA, Food Safety and Inspection Service’s (FSIS) Meat, Poultry, and Egg Product Inspection Directory (Local Food Economics, N.D.); and the USDA, NASS 2022 Census of Agriculture (USDA, NASS, 2022).

The 2022 Census of Agriculture reports gross sales values across four distinct direct sales channels: direct to consumer, direct to retail markets, direct to institutions, and direct to intermediate markets that promote locally or regionally branded food products. These channels are grouped into two categories: direct to consumer (DTC) and intermediated, with the latter encompassing retail, institutions, and intermediate markets (Bauman et al., 2024). This information is included in our regression analysis. Further details are provided in the Model Specification section.

Stylized Facts on Farm to School Participation, Local Food Sourcing, and Procurement Challenges

This section presents stylized facts from the 2023 F2S Census and the Supply Chain Disruption Surveys. We begin with the F2S Census to examine the F2S participation rate, the share of F2S SFAs purchasing local foods and their definitions of “local,” SFAs’ funding sources, and SFAs’ procurement channels for local foods. We then evaluate the findings from the Supply Chain Disruption Surveys concerning changes in local food purchasing and the reasoning provided by SFAs. While the surveys captured a wide range of challenges faced by SFAs, our focus is limited to those directly affecting local food procurement and, conversely, whether supply chain disruptions led to increased reliance on local vendors.

Although the two surveys were conducted independently and cannot be linked or cross-referenced, each survey offers valuable insights into SFAs’ local food procurement. As such, our analysis treats them separately, while recognizing the complementary perspectives they provide.

F2S Participation and Activities Have Increased From the 2018–2019 to 2022–2023 School Years

The F2S Census included more than 30 F2S activities categorized as serving local foods, promotion of local foods, agriculture education and edible school gardens, local food sourcing and procurement, and other activities (table 1). According to the prior F2S census, during the 2018–19 school year, nearly two-thirds (65.4 percent) of SFAs participated in F2S. Almost three-quarters (74.1 percent) participated in at least one F2S activity during the 2022–2023 school year, an additional 7 percent began participating during the fall of the 2023–24 school year, and 6 percent reported they plan to participate in the future (Machata et al., 2024). More than two-thirds of participating SFAs (68 percent) participated in five or more F2S activities.

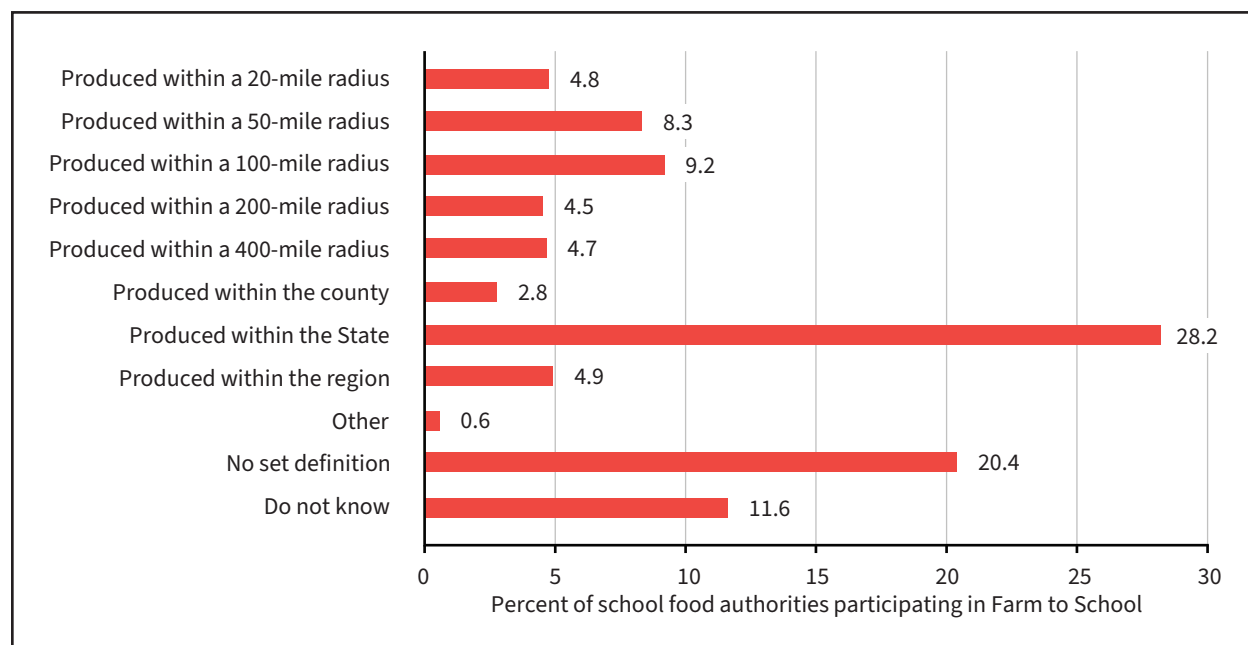
Serving local foods was the most common activity (63 percent of all SFAs), followed by 60 percent for food sourcing and procurement activities, 49 percent for education and garden activities, and 45 percent for promotion of local food activities.

Most F2S Schools Purchased Local Food in the 2022–2023 School Year

Nearly three-quarters of U.S. schools participating in F2S activities reported purchasing local food during the 2022–2023 school year. There is, however, no overarching definition of local that SFAs must adhere to when purchasing local foods. Figure 1 shows the self-determined definitions of local reported by SFAs in the 2023 F2S Census. The most common definition of local food used by SFAs participating in F2S during the 2022–2023 school year was “produced within the State” (28 percent). The second most common response for the 2022–2023 school year was “no set definition”—respondents might use different definitions for different products (e.g., local potatoes may be those produced within the State, but local apples may be those produced within a multi-State region). Some respondents reported defining local food as coming from a specific radius from the SFA, such as 100 miles (9 percent) or 50 miles (8 percent).

Figure 1

Farm to School school food authority (SFA) definitions of “local” reported in the 2023 Farm to School Census



Note: N = 8,823. Responses were limited to SFAs participating in farm to school in the 2022–2023 school year. Responses were weighted using national non-response weights.

The full question was: “How does your SFA define “local” for the majority of its school food procurement? (Please choose one. If your definition of local varies by product, please select the most commonly used definition.)”

Source: USDA, Economic Research Service calculations using data from the 2023 Farm to School Census.

SFA policies may align with State and national F2S incentives. For instance, most State-level local food procurement policies (e.g., grant and procurement subsidy programs) use the State-level definition and require SFAs to demonstrate their purchases with State procurement funds meet this standard. However, even for SFAs with strict definitions of local, it can be difficult to confirm that their purchases meet their own local definition, particularly when local foods are purchased through intermediaries that cannot verify the locations of their vendors for institutional buyers. Thus, this report does not attempt to redefine or categorize “local,” rather, it utilizes the figures reported by SFAs based on their own determinations of what constitutes local food.

How School Food Authorities Fund Local Food Purchases

SFAs have two main sources of funds for purchasing local foods—entitlement and non-entitlement funds (figure 2). Entitlement funds provided by Federal and State governments are allocated to SFAs based on the number of meals served (USDA, FNA, 2022b). The funds can be used to buy local foods via the USDA Foods in Schools Program (see box, USDA Foods in Schools Program), which includes both the USDA Foods⁴ and USDA Department of Defense Fresh Fruit and Vegetable Program (USDA DoD Fresh) (USDA, FNA, 2023a). Non-entitlement revenue includes school food reimbursements and revenue, local food grants (including State procurement incentives), and other sources. Nevertheless, SFAs have limits on how they can procure foods due to Federal procurement regulations (applicable to a wide variety of Federal purchases to encourage responsible use of public funds) which require them to

⁴ USDA Foods are 100 percent American grown and processed. USDA makes over 150 USDA Foods available for SFAs to order using their entitlement funds, for use in school meal programs (USDA, FNA, 2023c).

use competitive bid procurement processes. Micro and small purchase options at the Federal level allow SFAs greater flexibility in school food spending. Some non-entitlement revenue can also be used by SFAs to fund development and maintenance of school gardens, which are another source of local food.

Table 3

Local food funding sources and procurement methods

Sources of funds	Purchasing and procurement methods	Local food intermediaries and direct sources
- Entitlement - Non-entitlement revenue (reimbursement from school meals, food sales, grants, and more)	- USDA Foods - USDA DoD Fresh - Formal procurement (invitation for bids, request for proposals) - Informal procurement (small purchases, micropurchases)	- Broadline distributors - Produce distributors - Cooperatives - Food hubs - Grocery stores - Farms - School gardens

Note: A school food authority (SFA) must use its entitlement to obtain foods via the USDA Foods and USDA DoD Fresh programs. In some cases, USDA DoD Fresh contracts are facilitated through farms, cooperatives, food hubs, and distributors. Formal procurement methods might use contracting mechanisms like group purchasing, forward contracts, the geographic preference option, and more. See the USDA, Food and Nutrition Administration publication *Procuring Local Foods for Child Nutrition Programs* (USDA, FNA, 2022b) for detailed definitions and discussion of purchasing and procurement methods.

Source: USDA, Economic Research Service compilation using USDA, Food and Nutrition Administration (2022b) and Williams et al. (2021).

How these local foods purchased using the methods listed in table 3 get to students once they are purchased is not the same in every SFA. Some SFAs operate their own lunchrooms (known as self-operation or “self-op”), whereas others purchase vended meals or work with food service management companies. Furthermore, SFAs might have regional, central, or satellite kitchens where food is prepared in another location before delivery. These institutional structures affect the SFAs’ local food purchasing patterns.

USDA Foods in Schools Program

The USDA Foods in Schools program is an entitlement program that “supports domestic nutrition programs and American agricultural producers through purchases of 100 percent American-grown and produced foods for use by schools and institutions participating in the National School Lunch Program (NSLP), the Child and Adult Care Food Program (CACFP), and the Summer Food Service Program (SFSP).” USDA Foods includes USDA Foods Bulk for Processing, USDA Foods Direct Delivery, and the USDA Department of Defense (DoD) Fresh Fruit and Vegetable Program (USDA DoD Fresh). Though USDA Foods, States offer their school food authorities (SFAs) items from the USDA Foods Available List and the SFAs use their entitlement dollars to purchase the items (USDA, FNA, 2025).

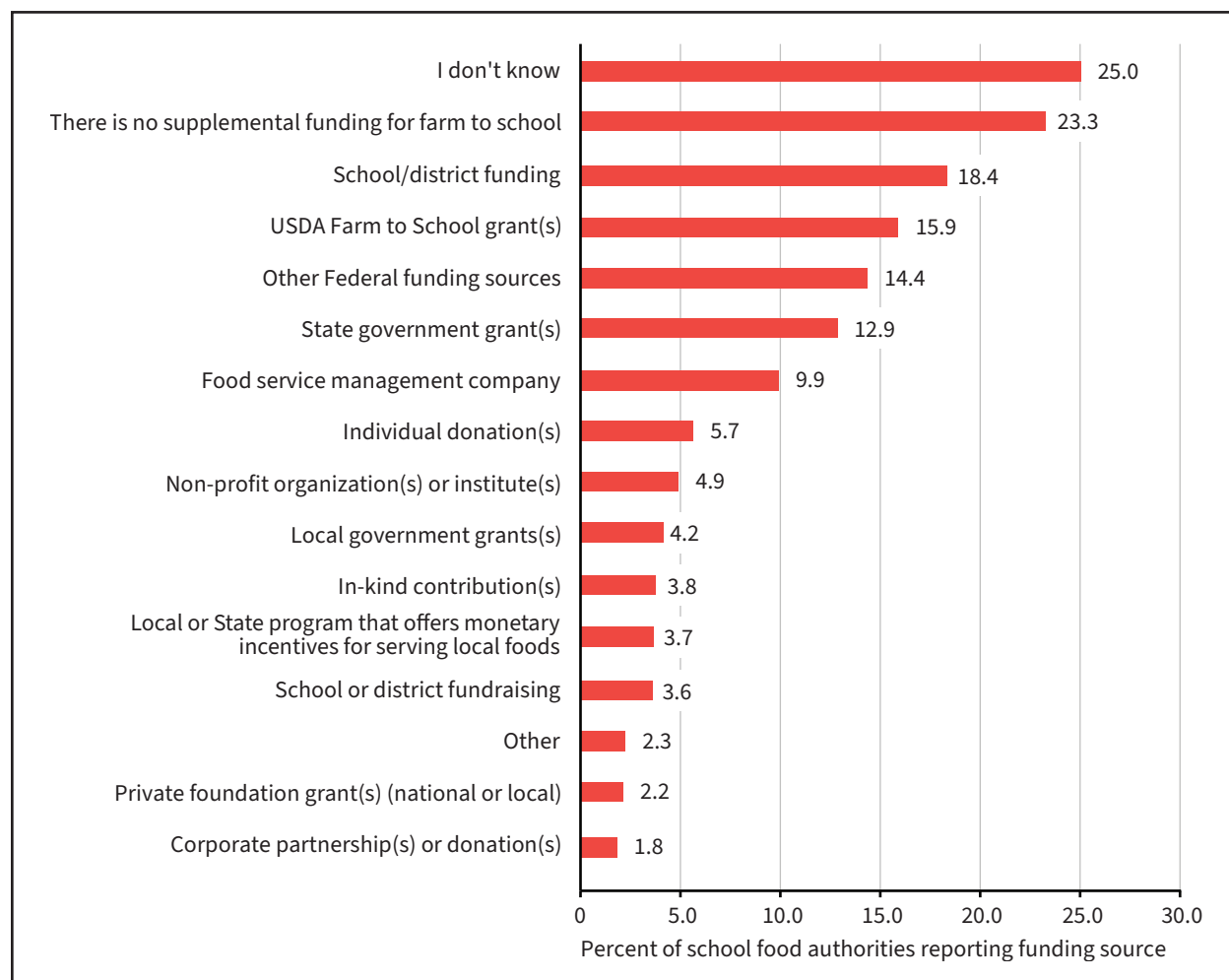
USDA DoD Fresh allows schools to use their USDA Foods entitlement dollars to buy fresh produce. This program operates through a partnership between the USDA and the DoD Defense Logistics Agency (DLA), alongside State distributing agencies in each participating State. The DLA serves as the procurement agent that contracts with the produce distributors to purchase and deliver the products. The schools and SFAs can use the Fresh Fruit and Vegetable Order/Receipt System (FFAVORS) online catalog to identify available and local produce.

The program supports the purchase of locally grown produce to the maximum extent practicable. For USDA DoD Fresh, local is defined as produce from within the State or an adjacent State. Vendors are required to include the State where each fruit or vegetable is grown in the FFAVORS system. Schools in 49 States, Washington, DC, Puerto Rico, the Virgin Islands, and Guam participate in USDA DoD Fresh.

The F2S Census does not collect data on specific funding sources for local foods procurement but does ask about general F2S funding sources. Nearly a quarter of F2S SFAs in the 2022–2023 school year did not have or did not know if they have supplemental funding for F2S activities (figure 2). School/district funding was the most reported funding source (18 percent), followed by USDA F2S grants (16 percent), and other Federal funding sources (14 percent). Appendix A details the Federal- and State-level policies and grant programs for F2S.

Figure 2

School food authority (SFA) Farm to School funding sources reported in the 2023 Farm to School Census



Note: N = 8,730. Responses were limited to SFAs participating in farm to school programs in the 2022–2023 school year (F2S SFAs). Responses were weighted using national non-response weights. Other Federal funding sources include USDA Local Foods for Schools grants, Local Food Producer grants, and others.

The full question (Q22) was: “To the best of your knowledge, in school year 2022–2023, how did your SFA fund participation in farm to school activities (e.g., purchasing local foods, paying staff, organizing promotional events)?”

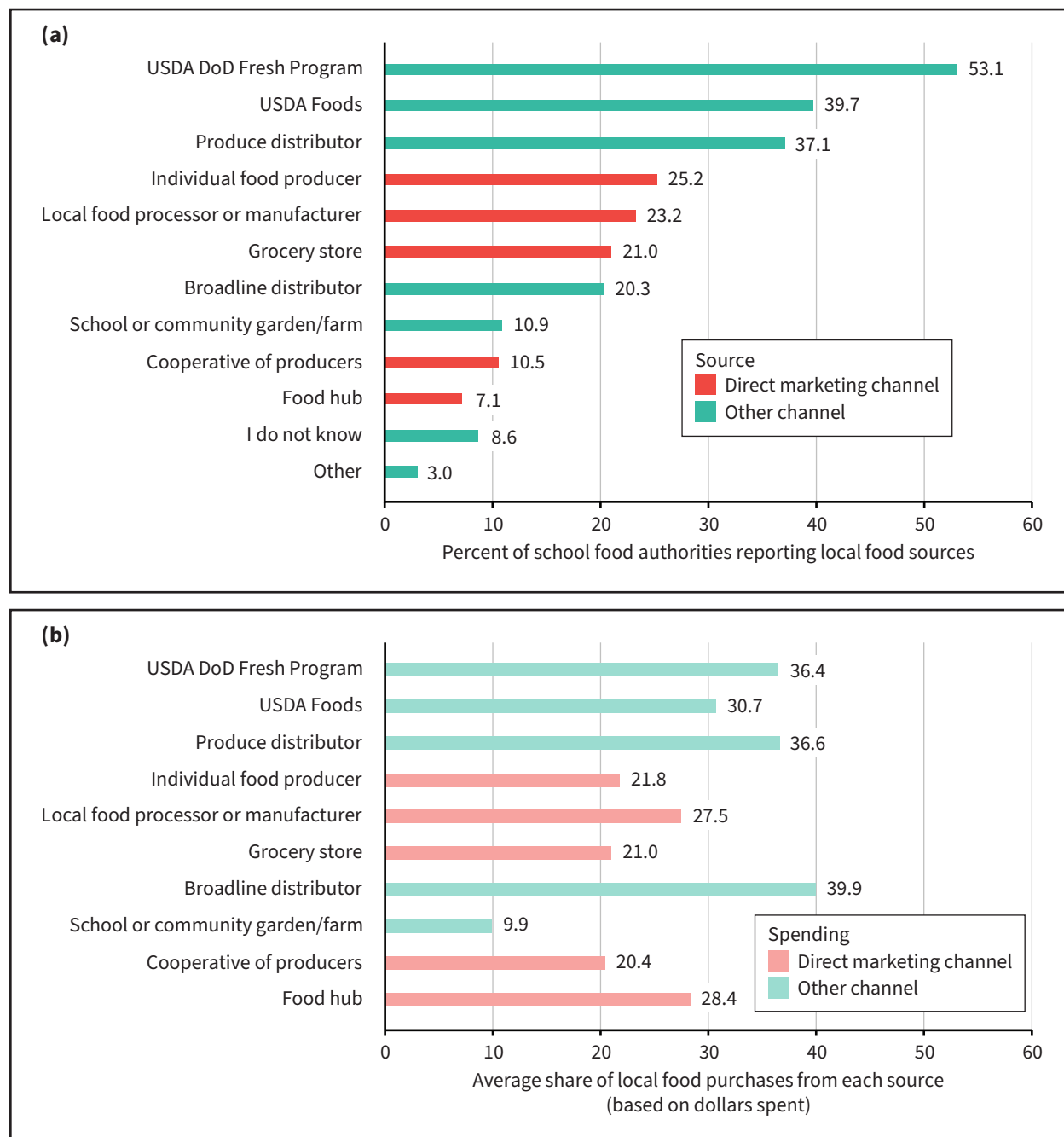
Source: USDA, Economic Research Service calculations using data from the 2023 Farm to School Census.

Most School Food Authorities Source Local Foods From USDA Programs

During the 2022–2023 school year, nearly two-thirds of SFAs and approximately 75,000 schools served local foods. Among F2S SFAs, the most frequently reported sources of local foods were USDA programs (figure 3). More than half of SFAs (53 percent) obtained local foods through the USDA DoD Fresh program—a 10-percent increase from the 2018–19 school year. This program allows SFAs to use their entitlement to procure fresh produce and offers information about food sourcing.

Figure 3

Percent of Farm to School school food authority (SFA) participants sourcing local food from each source and average share of local food purchasing from each source, 2022–2023 school year



Note: N = 8,851 for the local food source question (figure 3a) and N = 4,413 for the local food spending question (figure 3b). Responses limited to school food authorities participating in Farm to School (F2S) in the 2022–2023 school year. Responses were weighted using national non-response weights. The grocery store may or may not be a direct-to-retail marketing channel, given that the F2S Census data do not indicate whether the grocery store procures local foods directly from the producer. A produce distributor is a foodservice company that specializes in sales of wholesale fruits and vegetables to schools and other foodservice operators. USDA Foods is the USDA Foods in Schools Program that provides U.S. agricultural products for use in meals in the National School Lunch Program, Child and Adult Care Food Program and Summer Food Service Program. School food authorities receive USDA Foods (also called entitlement foods or commodity foods) at an established per meal rate.

The full question for the local food sources was: “For school year 2022–2023, please indicate if your SFA procured local foods from any of the following sources (please choose all that apply)”. The full question for the local food purchases was: “In school year 2022–2023, what percent of your local purchasing (based on the dollars spent) came from each of the sources you selected? Your best estimate is fine.”

Source: USDA, Economic Research Service calculations using data from the 2023 Farm to School Census.

The next most common source of local foods was USDA Foods, reported by 40 percent of SFAs. USDA Foods refers to foods purchased by USDA and provided to SFAs for use in school meal programs.

Only 25 percent of F2S SFAs purchased local foods directly from individual producers, such as those at farmers markets or through community-supported agriculture programs. Similarly, about one-quarter of F2S SFAs purchased items from local food processors or manufacturers. Local food distribution generally includes direct-to-consumer, direct-to-retail, direct-to-institution, and direct-to-intermediary channels. In this report, direct marketing channels include individual producers, grocery stores,⁵ cooperatives, farmers markets or roadside stands, and food hubs.

In total, 56.2 percent of SFAs procured at least some local foods through direct marketing channels (i.e., individual producers, food hubs, local processors or manufacturers, producer cooperatives, or grocery stores). In comparison, 65.3 percent sourced at least some local foods through Government programs (USDA Foods and USDA DoD Fresh), while 46.7 percent sourced at least some local foods from distributors (both broadline distributors and produce distributors). On average, SFAs that purchased some local foods directly from individual producers spent 22 percent of their local food budgets through that channel. Those purchasing at least some local foods through USDA DoD Fresh and USDA Foods allocated 36 and 31 percent, respectively, of their local food expenditures to those programs. Key drivers behind the use of direct procurement sources for local foods are explored further in the next chapter.

Challenges of Procuring and Serving Local Foods

In the 2023 F2S Census, F2S SFAs reported a range of challenges related to procuring local foods during the 2022–2023 school year, including issues of availability, procurement and delivery, cost, and staff/kitchen capacity. More than 42 percent of F2S SFAs faced challenges with local food availability, citing limited supply (30.8 percent), lack of access through primary vendors (16.9 percent), difficulty identifying local producers or distributors (15.9 percent), limited access to precut or processed products (14.1 percent), and lack of product variety (14 percent).

Nearly 35 percent of SFAs experienced cost-related barriers, reporting that local foods were more expensive than conventional options (27.3 percent) or had unstable pricing (13 percent). Around 29 percent encountered procurement and delivery challenges, with delivery issues being the most commonly cited within this category (17.1 percent). In terms of staff and kitchen limitations, 18 percent of SFAs reported issues, including 14 percent who lacked sufficient staff time to prepare local foods.

While the F2S Census captures challenges related to local food procurement, the SFA Supply Chain Disruptions Surveys provide additional insights into changes in procurement choices and the factors driving those changes during the COVID-19 pandemic. Although these two datasets cannot be directly linked, the Supply Chain Disruption Surveys offer complementary and more detailed analysis.

From the SFA Supply Chain Disruptions Surveys, most of the SFAs surveyed reported problems in procuring food or non-food supplies during the 2 survey years (USDA, FNA 2022a, 2023d). In response to these supply chain challenges, roughly one quarter of SFAs reported increasing their use of local value chains. Specifically, 27 percent of all SFAs increased their use of local food vendors in the 2021–22 survey, while in the following school year 23 percent of SFAs purchased more local

⁵ The F2S Census data were not designed to disaggregate these specific categories. As a result, it is unclear whether grocery stores qualify as a direct-to-retail marketing channel, depending on their sourcing practices. Despite this ambiguity, we include grocery stores in the direct marketing classification, as they are likely to source local products directly from producers in practice.

food (table 4). Small SFAs were slightly less likely to report increasing their use of local value chains during both school years. In both years, rural SFAs were 4 percentage points more likely to purchase more food from local vendors or to buy more local foods. The 2022–2023 school year survey also asked if SFAs decreased their purchases of local foods due to supply chain constraints, and 3 percent responded that they did, with large and very large SFAs slightly more likely to give this response.

The 2022–2023 questionnaire also asked about reasons for increasing local food purchases. For SFAs that bought more local food, the main reasons given include local foods being easier to find and being more affordable. Policies, programs, performance goals, and receipt of grants or other funding also contributed, and were selected more often by larger SFAs. Receiving useful information or training on purchasing local foods ranked lowest among reasons SFAs increased local procurement. There was little difference between rural and non-rural SFAs in the reasons given for increasing their local food purchases.

Table 4

Prevalence of increased use of local vendors and increased local food purchases by school food authority SFA (percent of SFAs)

Group:	SFA size				Urbanicity		Overall
	Small	Medium	Large	Very large	Rural	Urban	
2021–2022 school year							
Percent of SFAs reporting increased use of local vendors	23	30	36	30	28	24	27
2022–2023 school year							
Percent of SFAs reporting...							
Increase in local food purchases	19	21	23	20	21	17	23
Decrease in local food purchases	2	3	4	4	2	2	3
Percent of SFAs reporting the following reasons for increasing local food purchases:							
Local foods have been easier to find	68	64	64	64	68	60	65
Local foods have been more affordable	24	19	17	21	21	22	21
Policies, programs, or performance goals at the State or local level encourage local food purchasing	18	36	40	45	26	27	26
SFA received grant or other funding to purchase more local foods	15	27	32	40	21	21	20
SFA received useful information or training on purchasing local foods	6	9	10	14	7	9	7
Other	9	7	10	7	9	7	8

Note: Responses were weighted using national non-response weights.

Source: USDA, Economic Research Service using data from the 2021–2022 and 2022–2023 SFA Supply Chain Disruptions Surveys.

Modeling Key Drivers of Direct Procurement Sources for Local Foods

In this section, we focus on evaluating the characteristics and local food infrastructure associated with SFAs procuring local foods directly from individual producers or through direct marketing channels. We include individual producers, grocery stores, cooperatives, farmers markets or roadside stands, and food hubs as direct marketing channels. We outline our modeling approach and summarize key findings in this section.

Model Specification

We estimated two separate binary outcomes:

- (1) The likelihood of an SFA purchasing at least some local food directly from an individual producer.
- (2) The likelihood of an SFA procuring at least some of local food from any direct marketing channels.

Direct procurement from individual producers, which includes purchases made at farmers markets or through community-supported agriculture (CSA) programs, is a subset of direct marketing channels. Approximately 26 percent of participating F2S SFAs engaged in such direct procurement of some local foods from an individual producer in the 2022–2023 school year, while more than 56 percent sourced some local foods from any direct marketing channels.

Table 5 details the control variables included in the models. Control variables are grouped into two primary categories: (1) SFA-level characteristics and (2) local food infrastructure indicators corresponding to the State in which the SFA operates.

Table 5
Variable descriptions

Variable	Summary statistics	Source
Outcome variables		
Procures directly from individual producer	Categories and shares of each category: 1. Yes: 25.7 percent 2. No: 74.3 percent	2023 F2S Census (Q27)
Procures from any direct marketing channels	Categories and shares of each category: 1. Yes: 56.3 percent 2. No: 43.7 percent	2023 F2S Census (Q27)
Control variables: SFA characteristics		
Urbanicity based on the area in which schools are located	Categories and shares of each category: 1. Urban (territory inside urbanized area and principal city): 16.9 percent 2. Suburban (territory outside a principal city and inside an urbanized area, territory in a fringe town): 27.6 percent 3. Rural (territory inside an urban cluster more than 10 miles from an urbanized area, territory outside urban clusters and areas): 55.6 percent	USDA, Food and Nutrition Administration (FNA) calculated field in the 2023 F2S Census dataset.

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Variable	Summary statistics	Source
Control variables: SFA characteristics		
SFA size	Categories and shares of each category: 1. Small (<1,000 students): 49.1 percent 2. Medium (1,000 to 4,999 students): 35.6 percent 3. Large (5,000 to 24,999 students): 12.8 percent 4. Very large (≥ 25,000 students): 2.5 percent	USDA, FNA calculated field in the 2023 F2S Census dataset.
Years of F2S Participation for F2S SFAs	Categories and shares of each category: 1. Less than 3 years: 48.8 percent 2. 3–5 years: 23.6 percent 3. 6–10 years: 14.8 percent 4. More than 10 years: 12.7 percent	2023 F2S Census (Q18).
F2S intensity	Range: 0–14.8; Mean: 5.52; Standard deviation: 3.48	USDA, FNA calculated field in the 2023 F2S Census dataset (see box, Farm to School Intensity)
Has grant or other funding	Categories and shares of each category: 1. Yes: 64.4 percent 2. No (includes “I don’t know”): 35.6 percent	2023 F2S Census (Q22). See Figure 2 for more details.
Number of local food procurement challenges selected under four separate questions: • Availability of local foods • Procurement and delivery of local foods • Cost of local foods • Staff/kitchen	Range, mean, and standard deviation in parenthesis of the number of challenges selected in each question: • Availability of local foods: 0–8, 1.10 (1.65) • Procurement and delivery of local foods: 0–9, 0.64 (1.24) • Cost of local foods: 0–3, 0.43 (0.66) • Staff/kitchen: 0–6, 0.43 (1.04)	2023 F2S Census (Q12a–Q12d).
Percent of students eligible for free/reduced price lunch	Range: 0–100; Mean: 55.3; Standard deviation: 33.5	USDA, FNA calculated field in the 2023 F2S Census dataset.
Number of full-time staff dedicated to F2S	Categories and shares of each category: 1. No staff: 64.4 percent 2. 1–3 staff: 25.5 percent 3. 4–10 staff: 6.1 percent 4. More than 10 staff: 4.1 percent	F2S Census (Q21a).
Number of full- and part-time staff who use some portion of their time for F2S activities, but whose job is not fully dedicated to F2S activities	Categories and shares of each category: 1. No staff: 23.4 2. 1–3 staff: 41.4 3. 4–10 staff: 20.0 4. More than 10 staff: 15.1	F2S Census (Q21b)

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Variable	Summary statistics	Source
Control variables: Local food infrastructure		
Number of farmers markets	Range, mean, and standard deviation in parenthesis: - Per 100 people at the county level: 0–0.16, 0.003 (0.005) - Per 100,000 people at the State level: 0.69–.4, 2.51 (1.70)	USDA, Economic Research Service (ERS) calculated field using data from USDA, Agricultural Marketing Service’s (AMS) local food directory for farmers markets
Number of food hubs	Range, mean, and standard deviation in parenthesis: - Per 100 people at the county level: 0–0.69, 0.00 (0.001) - Per 100,000 people at the State-level: 0–0.93, 0.08 (0.08)	USDA, ERS calculated field using data from USDA, AMS’s local food directory for food hubs
Number of meat processing facilities	Range, mean, and standard deviation in parenthesis: - Per 100 people at the county level: 0–0.18, 0.003 (0.005) - Per 100,000 people at the State level: 0.45–5.54, 2.32 (0.96)	USDA, ERS calculated field using data from the USDA, Food Safety and Inspection Service’s (FSIS) Meat, Poultry, and Egg Product Inspection Directory
Number of refrigerated warehouses	Range, mean, and standard deviation in parenthesis Per 100,000 people at the State level: 0.05–1.56, 0.36 (0.33)	USDA, ERS calculated field using data from USDA, National Agricultural Statistics Service’s (NASS) Capacity of Refrigerated Warehouses Summary
Percent of State’s farm operations selling through direct-to-consumer marketing channels	Range: 0.14–100; Mean: 10.98; Standard deviation: 9.78	USDA, ERS calculated field using data from the 2022 Census of Agriculture
Percent of State’s farm operations selling through intermediated marketing channels	Range: 0.11–66.7; Mean: 5.02; Standard deviation: 5.87	USDA, ERS calculated field using data from the 2022 Census of Agriculture
Number of State’s local food procurement policies (as of 2023)	Range: 0–29; Mean: 7.01; Standard deviation: 7.84	USDA, ERS calculated field using data from NFSN Farm to School State Policy Handbook (2021)

SFA = School Fund Authority; F2S = Food to School; NFSN = National Farm to School Network.

Note: The question numbers are presented in parenthesis in the Source column if the variable was part of the 2023 F2S Census. For those variables, the summary statistics were calculated with responses limited to SFAs participating in farm to school in the 2022–2023 school year. Responses were not weighted. All categorical variables were predefined in the 2023 F2S Census except the number of full-time F2S staff and the number of full-time and part-time F2S staff, which we grouped into four categories given that most responses were clustered at low numbers of staffs. For the number of State’s local food procurement policies, only enacted legislation was included. Policies were grouped into categories based on their primary funding focus or general intent: (i) procurement and (ii) education-related initiatives. If a policy supported both types of activities, it was counted in both categories. The total count reflects policies focused on procurement, education, and other activities such as establishing task forces.

Source: USDA, Economic Research Service calculations using data from 2023 Farm to School Census; 2022 Census of Agriculture; USDA, Agricultural Marketing Service’s Local Food Directory for Farmers Markets; USDA, Food Safety and Inspection Service’s Meat, Poultry, and Egg Product Inspection Directory; USDA, National Agricultural Statistics Service’s Capacity of Refrigerated Warehouses Summary; and National Farm to School Network’s Farm to School State Policy Handbook (2021).

School Food Authority (SFA) characteristics

USDA, FNA assigns urbanicity categories to SFAs based on the National Center of Education Statistics Common Core of Data (NCES CCD). The CCD defines 12 urbanicity categories based on population and proximity to cities that USDA, FNA aggregates into urban, rural, and suburban classifications. SFAs located in urban, suburban, and rural areas may have different access to direct sources of local food. Urban areas are more likely to have established food hubs and distributors that can aggregate local produce and sell to schools. According to the 2022 Census of Agriculture, 85 percent of operations selling through either direct channels or direct sales by gross value were in or adjacent to metropolitan areas in 2020. Nearly a quarter of direct sales were generated in metropolitan areas with more than 1 million people. Conversely, SFAs in urban areas may have more competition for local food from restaurants, grocery stores, and other institutions than their suburban and rural counterparts.

SFA size, as measured by the number of students, may factor into sourcing decisions. Larger SFAs order at higher volumes. It may be difficult to rely on individual producers or other direct marketing channels to meet demand (Gregoire, 2002). On the other hand, larger SFAs may have more resources to allocate to F2S programs, including staff time, budget, and technology. Further, SFAs with more than 5,000 students are more likely to serve local foods daily than smaller SFAs (Ralston et al., 2017). During the 2022–2023 school year, large F2S SFAs reported having a greater number of full-time staff dedicated to managing F2S activities, including coordinating and building relationships with farmers and food hubs. We use the SFA size categories that were defined in the 2023 F2S Census dataset.

Years of F2S experience may be associated with procuring local foods from direct marketing channels. Over time, SFAs may build stronger relationships with local producers, food hubs, and processors. Experienced SFAs may be able to negotiate more favorable terms with these suppliers, including flexible payment plans and risk-sharing agreements. They may also develop more efficient procurement and logistics systems, reducing administrative burdens and costs for both SFAs and suppliers. As with larger SFAs, more experienced SFAs reported higher levels of full-time staff dedicated to F2S. During the 2018–19 school year, SFAs that had participated in F2S activities for fewer than 3 years were more likely to report local food procurement challenges than more experienced SFAs (Bobronnikov et al., 2021).

Given that F2S participation rates do not distinguish between schools that participated in one F2S activity and those that participated in many F2S activities, we include the F2S intensity in the models. Though the research on the impacts of farm to school activities are mixed, there are some studies that find that the more activities in which a school participates, the more likely students, communities, and farms are to benefit (e.g., Christensen et al., 2018; Prescott et al., 2020). Measures of F2S intensity developed by Kashyap et al. (2024) show the intensity of participation in F2S by incorporating information about the number of and types of F2S activities in which the SFA is engaged, and the metric was included in the 2023 F2S Census dataset. (See box, Farm to School Intensity for a more detailed discussion.)

Having State or Federal funding or other external financial support may help the SFAs procure more local foods (Roche et al., 2015; Bonanno & Mendis, 2021). We include a binary variable of having grant or other funding or not in the model (figure 2). We also include the variable that accounts for the percent of students eligible for free/reduced price lunch in the SFA.

The number and type of challenges SFAs experience when procuring local foods may be associated with their procurement sourcing. Most F2S SFAs reported challenges procuring local foods during the 2022–2023 school year—fewer than a quarter reported having no challenges. Challenges are grouped into the following categories: availability of local foods, procurement and delivery of local foods, cost

of local foods, and staff/kitchen. Forty-two percent of F2S SFAs reported experiencing challenges related to the availability of local foods including difficulty finding local producers, suppliers, and distributors and local producers being unable to meet food safety requirements. SFAs facing these types of challenges may lean more heavily on traditional, large-scale suppliers to source local foods. In contrast, only 18 percent of F2S SFAs experienced procurement challenges related to insufficient kitchen equipment/space and staff to process and prepare local foods.

SFAs with full-time staff dedicated to F2S or full- and part-time staff who use some portion of their time for F2S activities but whose job is not fully dedicated to F2S activities may be in a better position to source local foods directly from producers or other direct marketing channels than those without for the previously discussed reasons. A SFA's level of engagement in F2S activities, as measured by the F2S intensity index and categorized as low, medium, and high, may be associated with the decision to procure from producers and other direct sources. SFAs that prioritize F2S engagement may allocate more resources, including staff time, budget, and technology to procuring local foods, allowing them to expand beyond traditional procurement sources. SFAs engaging in many F2S activities in addition to serving local food, like farm field trips and cooking classes, may develop better relationships with farmers compared to SFAs minimally participating in F2S.

Farm to School Intensity

Farm to School (F2S) intensity measures are divided into intensity of procurement of local foods and intensity of education activities. The metrics are discussed below:

Procurement intensity:¹ This index shows the degree to which a school food authority (SFA) was engaged in procuring and serving local foods. This intensity measure includes: the number of activities that involve procuring and serving local foods in the school; frequency of serving each of the following local foods: fruits, vegetables, protein, and grains; the expenditure on local foods as a proportion of total food expenditure; the number of education and promotion activities directly related to procurement activities, including taste tests and Harvest of the Month; and strategic activities at schools to facilitate and assist in procurement of local foods.

Education intensity: This index shows the degree to which an SFA was engaged in food, nutrition, garden, or agricultural education. This intensity measure includes: the number of garden-based activities in schools; food, nutrition, and agricultural education activities in the classroom; and community awareness programs like student field trips to farms and celebrating National Farm to School Month (October). USDA, Food and Nutrition Administration (FNA) developed the F2S education intensity index using this information.

¹ The local food procurement variable included in the F2S intensity measure differs from the outcome variables used in this analysis (Q7 versus Q27 in the F2S Census). The F2S intensity measure incorporates Q7, which asks whether a SFA procured any local foods. In contrast, Q27 captures more detailed information on the sources of local food procurement but is only administered to respondents who answered yes to Q7.

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Farm to School Intensity (continued)

Overall F2S intensity: This index shows the degree to which a SFA was engaged overall in F2S activities. For each SFA, USDA, FNA weighted the procurement intensity by the proportion of schools within the SFA that served local foods and weighted the education intensity by the proportion of schools within the SFA that provided agricultural education. USDA, FNA calculated the overall F2S intensity measure by adding together the weighted procurement and education intensity measures. Additionally, the overall intensity includes the staffing intensity that represents the hiring of staff dedicated to F2S activities, and staff training opportunities for F2S-related activities.

These metrics allow comparison of intensity of F2S program adoption between SFAs within a State and across the country. See Kashyap et al. (2024) for detailed F2S intensity index calculations. USDA, FNA included the F2S intensity index in the 2023 F2S Census dataset.

Local Food Infrastructure

The local food infrastructure variables serve as proxies for the availability of direct- or short-supply-chain procurement sources available to SFAs. Prior research indicates that infrastructure elements such as farmers markets and food hubs are positively associated with increased F2S participation and local food procurement (e.g., Botkins & Roe, 2018; Bonanno & Mendis, 2021; Wen & Connolly, 2022). These channels enable farmers to engage in direct marketing to institutions—either independently or through intermediaries such as food hubs, local processors, and retailers.

Farmers markets are one outlet for farmers to sell directly to consumers. Higher densities of farmers markets not only provide SFAs with more outlets from which to source local foods (California Department of Food and Agriculture, 2014) but may increase the visibility of and awareness of local foods in the surrounding community and bolster interest in F2S. Food hubs aggregate products from local farms and connect producers to buyers like restaurants, grocery stores, and institutions. They can provide SFAs with consistent supplies of local produce at large volumes, reducing the burden on schools to source products individually or from a variety of producers, and simplify logistics for both farmers and SFAs by handling transportation and storage. In some cases, the relationship may be multidirectional. For example, the presence of schools procuring local foods may lead to the creation of a food hub, or the presence of a food hub may facilitate SFAs purchasing local foods from direct rather than conventional sources.

Higher densities of refrigerated warehouses may affect procurement sourcing. Nearby facilities enable local farmers to store produce beyond its peak season, extending the availability of products to institutional buyers. This can lead to a more reliable supply of local food, reducing the need for distant suppliers. Schools are increasingly serving local meat. In the 2022–2023 school year, 32 percent of F2S participants reported purchasing protein, a statistically significant increase of 8 percentage points from the 2018–2019 school year. By total spending, beef and poultry were the third and fourth most purchased items, respectively, in the 2022–2023 school year. As such, the presence of in-State meat processing facilities may increase the likelihood of an SFA purchasing from a local processor.

We further included data on the share of all farms in each State selling through two direct marketing channels: direct-to-consumer and intermediated marketing channels.⁶ SFAs in States with higher shares of farms engaging in direct sales may have more opportunities to build relationships with local farmers. This may result in both a higher likelihood of purchasing from farms or other direct sources and of participating in non-procurement F2S activities like farm tours. We also include the cumulative number of State’s local food procurement policies (as of 2023), which might encourage the SFAs to procure local foods more.

Estimation

We estimate the model for the entire United States on the county level, with standard errors clustered at the State level. Appendix B details logistic regression models.

For both outcomes, we estimate the coefficients of the logit model and the average marginal effect (AME) associated with each coefficient. The logit model coefficients tell us how much the log-odds of the outcome change with a one-unit increase in the predictor variable. This can be difficult to interpret. AME is the average change in the probability of the outcome associated with a one-unit change in the explanatory variable, calculated across all observations in the dataset. It is calculated by holding the values of the other explanatory variables constant at their observed values. For discrete variables, like the categorical variables in the model, AME measures the change in probability of the outcome variable relative to the probability of the outcome variable for the omitted category when the discrete variable changes from the omitted category. For continuous variables like the local food infrastructure, AME gives us the average change in the probability of the outcome for a one-unit increase in the explanatory variable.

We did not weigh the sample due to the inclusion of county-level local food infrastructure explanatory variables. With the State-level variables and the clustered standard errors, we did not include additional State-level fixed effects.

Results

Table 6 presents the estimation results for both logit models examining direct local food procurement. Overall, the findings demonstrate robustness across different specifications. For transparency and further validation, additional model specifications are provided in appendix C. The interpretation of these results highlight key associations and suggests possible explanatory factors for observed relationships.

⁶ Intermediated marketing channels include the three non-direct-to-consumer direct marketing channels: direct-to-retail, direct-to-institution, and direct-to-intermediate.

Table 6

Coefficients and marginal effects for determinants of purchasing local food directly from producers or through direct marketing channels as obtained from logistic regression models, 2022–2023 school year

Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
School food authority (SFA) characteristics				
Urbanicity				
Urban (omitted)				
Suburban	0.08	0.01	-0.13	-0.03
Rural	0.60***	0.10***	0.12	0.02
SFA size				
Small (<1,000 students) (omitted)				
Medium (1,000 to 4,999 students)	-0.02	0	-0.27***	-0.06***
Large (5,000 to 24,999 students)	0.1	0.02	-0.39**	-0.08**
Extra Large (≥ 25,000 students)	0.06	0.01	-0.55**	-0.12**
Farm to School (F2S) experience				
Less than 3 years (omitted)				
3–5 years	0.31***	0.05***	-0.03	-0.01
6–10 years	0.33***	0.06***	0.1	0.02
More than 10 years	0.18	0.03	-0.01	0
F2S intensity	0.14***	0.02***	0.13***	0.03***
Have grants or other funding	0.52***	0.09***	0.48***	0.10***
Number of local food procurement challenges				
Availability	0.04	0.01	0.04*	0.01*
Procurement	0.02	0	0.05	0.01
Cost	-0.03	-0.01	-0.01	0
Staff/kitchen	0.18***	0.03***	0.12***	0.03***
Share of student eligible for free/reduced price lunch	0	0	-0.00*	-0.00*
Full-time F2S staff				
Zero (omitted)				
1–3 staff	-0.1	-0.02	-0.04	-0.01
4–10 staff	-0.29**	-0.05**	-0.24*	-0.05*
More than 10 staff	-0.71***	-0.11***	-0.44***	-0.10***
Part-time F2S staff				
Zero (omitted)				
1–3 staff	0.28***	0.05***	0.05	0.01
4–10 staff	0.34***	0.06***	0.23***	0.05***
More than 10 staff	0.34***	0.06***	0.19*	0.04*

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Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
Local food infrastructure				
Farmers markets per 100 people	18.06	3.06	20.61*	4.38*
Food hubs per 100 people	-2.64	-0.45	33.29	7.07
Meat processors per 100 people	18.77**	3.18**	6.13	1.3
Refrigerated warehouses per 100,000 people	1.01***	0.17***	0.80***	0.17***
Share of direct to consumer farms	0	0	-0.01	0
Share of intermediated farms	0	0	-0.01	0
Local food procurement policies	0.02	0	0.01	0
Constant	-3.64***		-0.76***	
N	6,433	6,433	6,433	6,433

Note: * Statistically significant at the 0.10 level. ** Statistically significant at the 0.05 level. *** Statistically significant at the 0.01 level. Clustered standard errors are at the State level. Procurement sources are included in the direct marketing channel category: directly from individual producer, directly from cooperative of producers, directly from a local food processor or manufacturer, food hub, and grocery store. Sample includes SFAs that purchased local food during the 2022–2023 school year. The local food procurement policies were cumulative counts of policies at the State level as of 2023. The model was estimated at the county level, except the local food procurement policies and the refrigerated warehouse per 100,000 people were only available at the State level. We tested for multicollinearity using the variance inflation factor (VIF), and the average VIF value was 1.45, indicating no significant correlation among independent variables.

Source: USDA, Economic Research Service calculations using data from the 2023 Farm to School Census; 2022 Census of Agriculture; USDA, Agricultural Marketing Service's Local Food Directory for Farmers Markets; USDA, Food Safety and Inspection Service's Meat, Poultry, and Egg Product Inspection Directory; USDA, National Agricultural Statistics Service's Capacity of Refrigerated Warehouses Summary; and the National Farm to School Network's Farm to School State Policy Handbook (2021).

Rural, more experienced, and highly engaged SFAs are more likely to procure local foods directly from individual producers

SFAs located in rural areas were significantly more likely to procure local foods directly from individual producers than their urban and suburban counterparts. While no statistically significant differences were observed between urban and suburban SFAs, rural SFAs exhibited a 10-percentage point higher likelihood of direct procurement. Years of F2S experience were also positively associated with direct purchasing: SFAs in most higher-experience categories were more likely to procure directly compared to those with fewer than 3 years of participation. SFA size did not affect procurement from individual producers, though medium, large, and extra large SFAs were all less likely to source from direct marketing channels than small SFAs.

Higher levels of F2S engagement, measured in F2S intensity, were more likely to increase direct local food procurement. SFAs with greater F2S intensity were significantly more likely to purchase local foods through both individual producers and direct channels. Each unit increase in F2S intensity was associated with a 2-percentage point increase in the likelihood of procuring from individual producers and a 3-percentage point increase from direct marketing channels. Since F2S intensity reflects a combination of factors, including local food expenditures and educational activities, these results suggest that SFAs with stronger F2S engagement may demonstrate greater institutional commitment to local procurement practices.

Schools that reported challenges in local food availability and staff/kitchen were the ones with more direct purchasing

The number and type of challenges faced by SFAs during procurement influenced direct purchasing behaviors. Each additional challenge related to availability was associated with a 1-percentage point increase in the likelihood of direct procurement. Staffing and kitchen-related challenges were associated with a 3-percentage point increase. These findings may suggest that SFAs engaging in direct procurement, such as purchasing from farmers, encounter more logistical and operational difficulties, resulting in reported challenges. However, although these results are statistically significant, their effect size is small and may be practically negligible.

Having any grant, funding, or part-time F2S staff is significantly linked to higher local food procurement practices (both from producers or through direct marketing channels)

SFAs with any form of grant or funding were 9 percentage points more likely to procure local food from individual producers and 10 percentage points more likely from direct marketing channels, controlling for other variables. While both full-time and part-time F2S staffing were significant predictors, they demonstrated opposite effects: SFAs with more full-time F2S staff were less likely to engage in direct procurement, whereas those with more part-time F2S staff showed higher likelihoods of purchasing via both direct channels.

This may reflect operational preferences among larger SFAs with extensive staffing (e.g., full-time F2S staffs), which may favor centralized wholesalers to meet demand more efficiently. SFA size was inversely correlated with procurement via direct marketing channels. Compared to small SFAs ($\leq 1,000$ students), extra large SFAs ($>25,000$ students) were 12 percentage points less likely to purchase food via direct marketing channels. Medium (1,000–4,999 students) and large SFAs (5,000–24,999 students) were, respectively, 6 percentage points and 8 percentage points less likely than small SFAs to purchase via direct marketing channels.

Local food infrastructure factors into direct procurement of local foods

Local food infrastructure significantly supports direct procurement. Several infrastructure variables were significantly associated with procurement practices. Notably, 1 extra farmers market per 100 people in the county was linked to a 438-percentage point increase in the likelihood of purchasing from direct marketing channels. Higher densities of meat processing facilities and refrigerated warehouses positively influenced procurement from individual producers. Refrigerated warehouse density was also positively associated with procurement from any direct marketing channel. Conversely, the presence of direct-to-consumer and intermediated farms, as well as State-level local food procurement policies, did not demonstrate a statistically significant effect on direct purchasing behaviors.

Discussion and Conclusion

Farm to school programs have been implemented in most schools and SFAs across the country (NSFN, 2023). As of the 2023 Farm to School Census, 74 percent of all SFAs participate in at least one farm to school activity and almost half of those engage in seven or more (Machata et al., 2024). Some of those schools and districts receive grant funding to assist their efforts to carry out their programs, but not all of them. Evaluating F2S impacts remains difficult due to program variability and the range of actors involved. Nonetheless, findings from the 2023 F2S Census highlight several commonly reported benefits: increased fruit and vegetable consumption (61 percent of SFAs), improved food quality (57 percent), support for local businesses (33 percent), and supply chain stability (22 percent) (Machata et al., 2024). Variability in procurement practices across SFAs may reflect underlying operational constraints, as well as differences in local food environments (Plakias et al., 2020; Long et al., 2021; Bobronnikov et al., 2021).

F2S also aims to foster local economic development. While some studies show positive impacts (Cureton, 2016; Christensen et al., 2018), others report limited or no spillover effects (Brown et al., 2014; Stickel & Deller, 2020). Farmer motivations to participate in F2S often stem from both practical and philosophical considerations (Ohmart, 2002; Izumi et al., 2010). Measuring the financial benefits to farmers is challenging given the mix of procurement channels, yet evidence suggests that participation in both direct-to-consumer and intermediated channels enhances farm viability (Bauman et al., 2018; Park et al., 2014; Key, 2024). A key data limitation for assessing farm-level financial effects is the lack of information on which farms sell to schools. For example, Bauman et al. (2024) found that very few farms report institutional sales in the Census. Because food supply chains are complex and products often move through multiple intermediaries, many farms may not know whether their products ultimately reach school markets. This makes it difficult to evaluate the farm-level impacts of school food markets or to assess how different supply chain structures influence farm-level financial outcomes.

USDA, ERS Agricultural Resource Management Survey (ARMS) data indicate a total of \$22.7 billion in direct sales by U.S. farms in 2022. Of this, farmers and ranchers sold \$277 million and \$13.5 billion directly to institutions and intermediate markets, respectively. While the former category includes K-12 schools, the latter is important because 37 percent of SFAs reported purchasing some local food from produce distributors compared to 25 percent who reported purchasing some local food directly from individual food producers during the 2022–2023 school year.

More than 75,000 schools served local foods during the 2022–2023 school year, with programs like USDA DoD Fresh being common procurement pathways. Our results show that SFAs in rural areas, with more years of F2S experience and higher engagement levels in F2S activities, were significantly more likely to procure local foods directly from individual producers. F2S intensity was positively associated with direct procurement: Each unit increase raised the likelihood of direct purchasing by 2 percent for individual producers and 3 percent for direct marketing channels. Smaller SFAs were more likely to source their local foods through direct channels, while larger SFAs leaned toward centralized procurement.

Interestingly, procurement challenges, especially regarding food availability and kitchen staffing, were positively associated with direct purchasing, suggesting that more engaged SFAs face greater logistical hurdles in sourcing locally. Access to grant funding and part-time F2S staff were linked to increased procurement via direct channels, while full-time F2S staffing showed an inverse relationship, possibly reflecting institutional preferences for efficiency-driven wholesale models as having full-time F2S staff

possibly correlated with the school size. Notably, among the reasons reported by SFAs for increasing local food purchases, receiving useful information or training on purchasing local foods ranked among the lowest. This may indicate a gap in practical procurement knowledge at the school level, pointing to opportunities for further support and capacity-building to facilitate direct purchasing.

These findings highlight the complex relationship between SFA characteristics, local infrastructure, and procurement challenges that shape direct local food purchasing behaviors. Many SFAs expanded their use of local value chains in response to broader supply disruptions, citing ease of sourcing and affordable pricing as top factors. Rural SFAs and those with greater F2S experience and engagement were more likely to procure food directly from producers. However, SFAs that reported higher levels of logistical and operational challenges—particularly those related to food availability, staffing, and kitchen capacity—also showed a positive correlation with direct procurement. The link between infrastructure elements and direct purchasing suggests that regional conditions can either facilitate or hinder local sourcing. Moreover, shifts in procurement behavior during supply chain disruptions indicate that farmers offering stable pricing and reliable delivery may be better positioned to meet institutional demand.

These insights point to the need for further research on how SFAs adapt to local food procurement challenges and how local systems interact to support local food sourcing. Understanding whether the observed relationships between F2S activity and local food environment characteristics are causal remains an open question. For example, the presence of farmers markets and producers engaged in direct sales may help alleviate availability-related challenges and encourage increased local food spending by SFAs. Alternatively, strong F2S engagement may contribute to the development of more robust local food networks. It is also important to consider that the findings in this report reflect data from a single school year, shaped by post-COVID-19 pandemic disruptions and elevated food inflation, which may influence their broader applicability.

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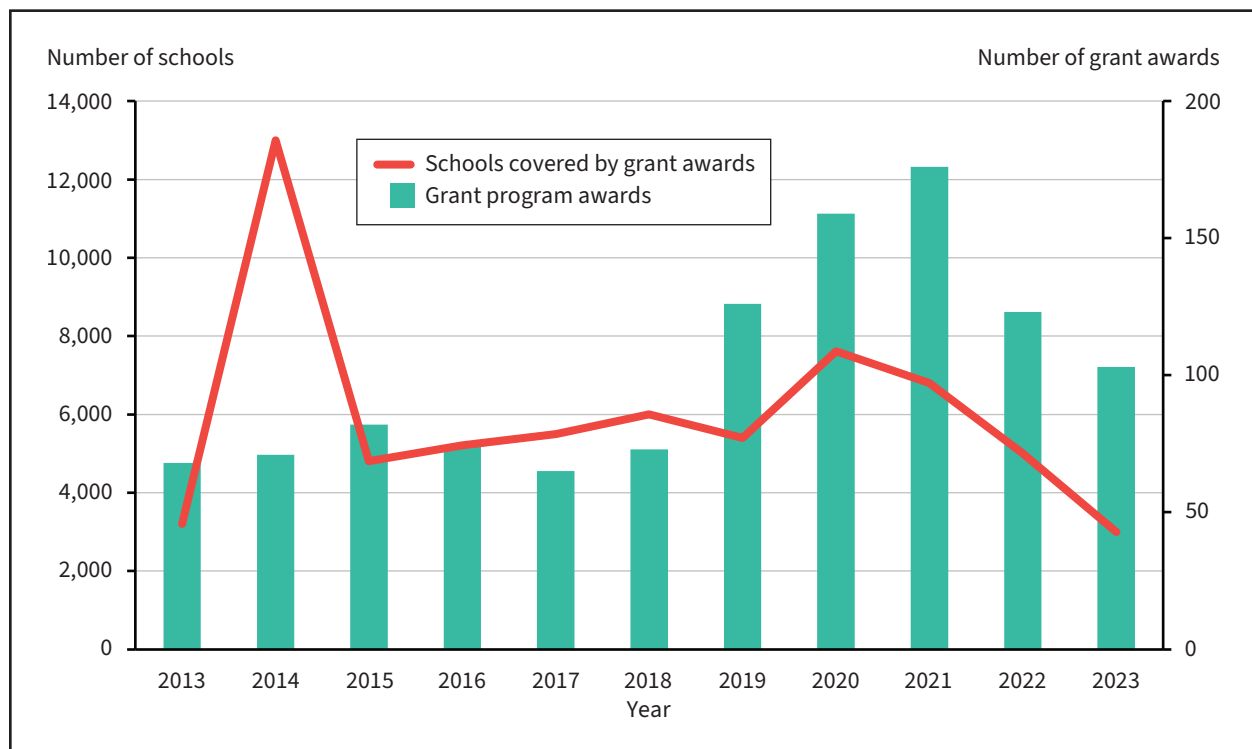
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Appendix A: Federal and State Farm to School Policies and Grant Programs

Since 2013, USDA, Food and Nutrition Administration (FNA) has distributed \$84 million in farm to school grants via the Patrick Leahy Farm to School Grant Program. This program has funded more than 1,000 projects across all 50 U.S. States, Washington, DC, the U.S. Virgin Islands, Guam, and Puerto Rico (figure A1). These projects have reached more than 28 million students in nearly 63,000 schools (USDA, FNA, 2023b; USDA, FNA, 2024). Supported activities include training, support operations, planning, purchasing equipment, developing school gardens, developing partnerships, and implementing farm to school programs (USDA, FNA, 2022d). In 2022, USDA, FNA provided \$60 million in Farm to School State Formula Grant funds to assist States in coordinating and providing technical assistance to build and increase the capacity of institutions to procure and use local foods in program meals and provide agricultural education opportunities⁷ (USDA, FNA, 2023c).

Figure A.1

Patrick Leahy Farm to School Grant Program annual totals, 2013–23



Source: USDA, Economic Research Service using data from USDA Food and Nutrition Administration.

USDA, Agricultural Marketing Service (AMS) established the Local Food for Schools Cooperative Agreement Program (LFS) and the Local Food Purchase Assistance Cooperative Agreement Program (LFPA) in 2021. LFS provided up to \$200 million in cooperative agreements to State governments to purchase food from local and regional producers for school meal programs (USDA, 2022a). For this program, “local” was defined as those within the State or within 400 miles of delivery destination. The funds went to State governments, who may also partner with local organizations, through these non-competitive cooperative agreements. States, territories, and Tribal organizations began signing agreements for these funds in September 2022 (USDA, AMS, 2023a).

⁷ While States were permitted to use these grants to fund State-level farm to school staff and training, they were not permitted to use the funds for procurement.

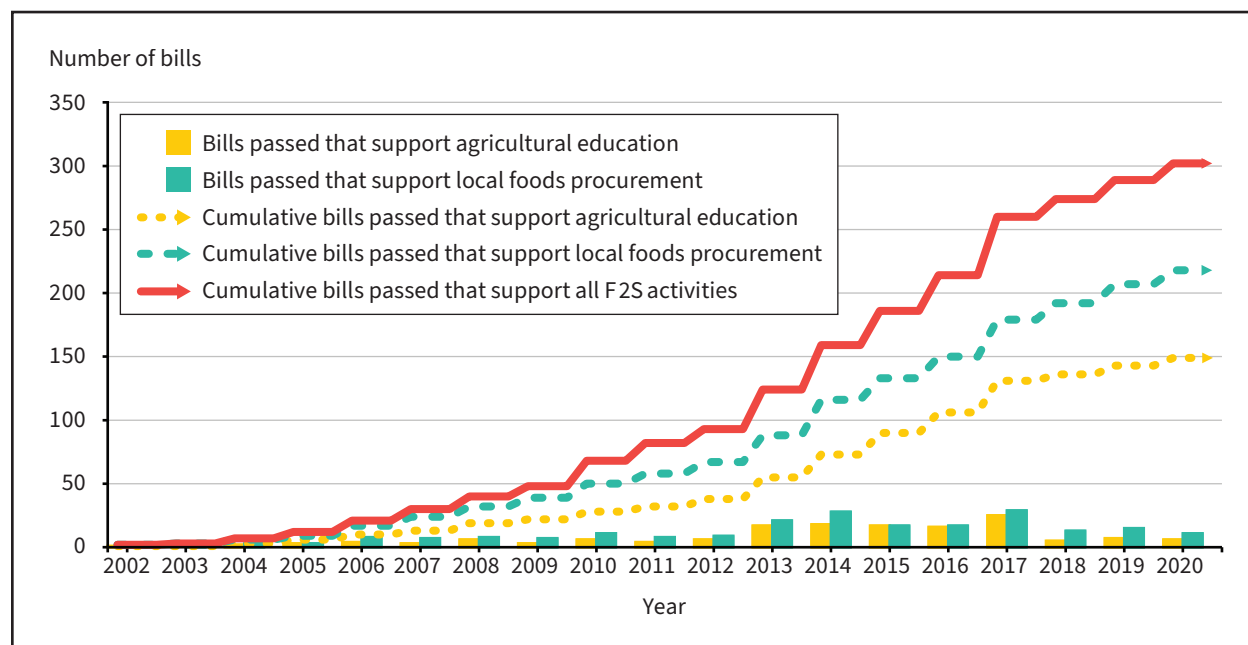
Using the same definition of local as the LFS program, the LFPA program used non-competitive cooperative agreements to provide up to \$900 million in funding for State, Tribal, and territorial governments to purchase foods to help support local and regional producers (USDA, AMS, 2023b). While its focus is on the producer, the food was destined for feeding programs, like food banks, rather than the schools and childcare institutions served by LFS. LFS and LFPA were both in operation during the 2022–2023 school year.

In addition, in 2022 and 2023, USDA, AMS had a specific farm to institution track in the Local Foods Promotion Program (LFPP) (USDA, AMS, 2024). In fiscal year 2022, six grants focused on farm to school totaling more than \$2.7 million in funding. There were 13 farm to institution grantees overall, totaling more than \$5 million in the program's first year (USDA, AMS, 2022).

State support, in aggregate, has outweighed Federal support. For example, in 2022, California allocated more than \$25 million in farm to school (F2S) projects, compared to approximately \$10 million distributed by USDA (California Department of Food and Agriculture, n.d.; USDA, 2022). Specifically, many States allow their funds to be used directly for local purchases, whereas USDA, FNA's Farm to School grant program funds cannot be used to subsidize procurement. The most proposed and enacted State policies in the 2019–20 school year were incentives focused on local food procurement (National Farm to School Network and Vermont Law School Center for Agriculture and Food Systems, 2021). For these policies, local food is usually defined as food produced within the State. Some States (e.g., Oregon) include food processed within the State even if ingredients are produced elsewhere. These local food incentives take a variety of forms, including noncompetitive opt-out programs (see box, Farm to School Policies in Oregon), competitive matching grants (see box, Farm to School Policies in Michigan), and programs that require a certain share of total food expenditure to be spent on local foods to qualify for funding (e.g., New York). These programs generally fund only a portion of local food procurement by school food authorities (SFA) and are not sufficient (nor intended by States) to cover all a SFAs' local food spending.

State and local policies are also noted to be more effectively tailored and responsive to local circumstances than Federal policies (Martinez, 2016; McCarthy et al., 2017). Figure A.2 shows the State farm to school bills introduced and passed between 2002 and 2020. According to National Farm to School Network and Vermont Law School Center for Agriculture and Food Systems (2021), between 2002 and 2020, 46 States, Washington, DC, and the U.S. Virgin Islands introduced 546 F2S bills and resolutions, of which 170 bills and 70 resolutions passed. Among these, the most common type of bill is one that provides funding for F2S through annual appropriations, permanent funds, and other revenue streams; 164 of these have been introduced since 2002. As of December 2020, 14 States have comprehensive F2S legislation (i.e., legislation that includes funded grant programs, coordinator positions, or local procurement incentives).

Figure A.2

State farm to school bills introduced and passed between 2002 and 2020

Note: This graph incorporates policies included in State budget documents, as many of these States allocate funding and appropriations for farm to school (F2S) activities, particularly those activities related to local food procurement. In contrast, the National Farm to School Network and Vermont Law School Center for Agriculture and Food Systems (2021) exclude F2S funding and policies that were approved or implemented solely through State budgetary processes (i.e., no legislation attached), Tribal laws, and policies.

Source: USDA, Economic Research Service using information from USDA, Agricultural Marketing Service; Colorado State University; Vermont Law and Graduate School's Center for Agriculture and Food Systems; and the National Farm to School Network.

Farm to School Policies in Oregon

After forming the Oregon Farm to School and School Garden Network in 2006, Oregon became one of the first U.S. States to introduce a bill to regularly fund an incentive program to purchase local foods. While this first bill did not pass, the State created a farm to school position in its Department of Agriculture and a parallel position in the Department of Education in 2008, making Oregon the first State to create positions in two State agencies that supported farm to school. It was in 2011 that the State succeeded in establishing a Farm to School and School Garden grant program (H.B. 2800), with pilot funding of \$200,000 to support Oregon school food authorities (SFA) in purchasing fresh Oregon food products and providing garden-based agriculture education. State grant funding was expanded significantly in the following years to a total of \$1.2 million for 2013–15 (H.B. 2649), \$4.5 million for 2015–17 (S.B. 5507), and \$4.5 million for 2017–19 (H.B. 2038). Funding was increased to \$10.4 million in 2019 (H.B. 2579), with an additional \$5 million in funding provided for the Department of Education. Following a reduction in funding due to the Coronavirus (COVID-19) pandemic (S.B. 5723), the State approved \$10.2 million in funding for the program for 2021–23 and then \$10.65 million for 2023–25 (National Farm to School Network and Vermont Law School Center for Agriculture and Food Systems, 2021; Oregon Farm to School and School Garden Network, n.d.).

A continuously funded program allowed the expansion of farm to school to districts across the State, with more than 130 of the State's 197 districts participating in 2015. That year, the procurement incentive was changed from a competitive grant (where SFAs had to apply and compete against each other) to universal eligibility, where all school food authorities were automatically

Continued on next page ►

Farm to School Policies in Oregon (continued)

enrolled into the program (S.B. 501). Simultaneously additional competitive grants for further reimbursement, education activities, and technical assistance remained available. This policy change increased the participation of low-income school districts in the program and also increased the average local foods purchases, especially fruits and vegetables in low-income districts (Giombi et al., 2020). Additionally, designating funds specifically to be used for agricultural- and garden-based education activities enabled districts in the State to implement these activities exclusively and independently of local food procurement (Rains et al., 2019).

Farm to School Policies in Michigan

Michigan's farm to school incentive program, 10 Cents a Meal for Michigan's Kids and Farms (10 Cents a Meal), is a State-funded program that provides an incentive match of up to 10 cents per meal to purchase Michigan-grown fruits, vegetables, and legumes. Grant amounts are determined by multiplying a year's worth of meals by 10 cents. This program is designed to improve daily nutrition and eating habits for Michigan children and invest in Michigan's agriculture and local food business economy. Administered by the Michigan Department of Education, 10 Cents a Meal was first funded through the State budget as a regional pilot program in 2016–17, covering 16 school districts in 8 counties with a budget of \$250,000 that was awarded in the form of competitive grants (S.B. 801). The initial concept for the 10 Cents a Meal program originated as a priority in the 2010 Michigan Good Food Charter.

10 Cents a Meal expanded into a Statewide program in 2020–21 with \$2 million in funding (S.B. 927) for schools, early care and education centers, and other non-school sponsors of USDA child nutrition programs. Participation grew to 143 grantees in 129 school districts (of 900) across 48 counties in 2020–21 and 257 grantees across 57 counties in 2021–22. The Michigan legislature increased funding to \$4.5 million in 2022 (H.B. 4411) and \$9.3 million in 2023 (McManus & Matts, 2023; National Farm to School Network and Vermont Law School Center for Agriculture and Food Systems, 2021). One of the core partners that supports 10 Cents a Meal, the Michigan State University Center for Regional Food Systems, evaluates the program each year, examining and reporting on the impacts on kids, the food programs that serve them, and farms and food businesses. Although impact valuations (e.g., McManus & Matts, 2023) indicated that the program produced positive benefits, the Michigan State legislature had not included funding for the 10 Cents a Meal program in the 2025–26 budget at the time this report was written, resulting in a funding gap for the program.

Appendix B: Logistic Regression Models

Logit regression models, also known as logistic regression models, are used to predict the probability of a binary outcome based on one or more predictor variables. Unlike linear regression, which predicts a continuous outcome, logistic regression is used when the outcome is categorical and typically binary, such as yes/no. These models predict the log-odds of the dependent event occurring as a linear combination of the independent variables, which is then transformed into a probability by the logistic function. This ensures the predicted values lie between 0 and 1. The probability is given by the logistic function:

$$P(X) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k)}}$$

Where Y is the outcome of interest, β_0 is the intercept, e is the natural logarithm, and $\beta_1 - \beta_k$ are the coefficients of independent variables $X_1 - X_k$. We use the logit models to predict the probability of school food authorities procuring local foods directly from an individual producer or from any direct marketing channels.

Table B.1

Coefficients and marginal effects for determinants of purchasing local food directly from producers or through direct marketing channels as obtained from logistic regression models, 2022–2023 school year, State-level regression

Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
School food authority (SFA) characteristics				
Urbanicity				
Urban (omitted)				
Suburban	0.06	0.01	-0.07	-0.01
Rural	0.71***	0.12***	0.27***	0.06***
SFA size				
Small (less than 1,000 students) (omitted)				
Medium (1,000 to 4,999 students)	-0.04	-0.01	-0.22***	-0.05***
Large (5,000 to 24,999 students)	0.16	0.03	-0.28***	-0.06***
Extra large (25,000 students or more)	0.19	0.03	-0.38**	-0.08**
Farm to school (F2S) experience				
Less than 3 years (omitted)				
3–5 years	0.29***	0.05***	-0.06	-0.01
6–10 years	0.31***	0.05***	0.05	0.01
More than 10 years	0.12	0.02	-0.04	-0.01
F2S intensity	0.14***	0.02***	0.13***	0.03***
Have grants or other funding	0.54***	0.09***	0.49***	0.11***

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Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
School food authority (SFA) characteristics				
Number of local food procurement challenges				
Availability	0.04*	0.01*	0.05***	0.01***
Procurement	0.01	0	0.03	0.01
Cost	0	0	0.02	0
Staff/kitchen	0.17***	0.03***	0.12***	0.02***
Share of student eligible for free/reduced price lunch	0	0	-0.00**	-0.00**
Full-time F2S staff				
Zero (omitted)				
1–3 staff	-0.07	-0.01	-0.04	-0.01
4–10 staff	-0.30**	-0.05**	-0.25**	-0.05**
More than 10 staff	-0.64***	-0.10***	-0.47***	-0.10***
Part-time F2S staff				
Zero (omitted)				
1–3 staff	0.25***	0.04***	0.04	0.01
4–10 staff	0.32***	0.05***	0.22**	0.05**
More than 10 staff	0.35***	0.06***	0.19*	0.04*
Local food infrastructure				
Farmers markets per 100,000 people	0.09***	0.01***	0.07***	0.02***
Food hubs per 100,000 people	0.43	0.07	1.60**	0.34**
Meat processors per 100,000 people	0.03	0	0.11**	0.02**
Refrigerated warehouses per 100,000 people	0.88***	0.15***	0.51***	0.11***
Share of direct to consumer farms	0.02***	0.00***	-0.01	0
Share of intermediated farms	-0.01	0	0	0
Local food procurement policies	0.01**	0.00**	0.01	0
Constant	-3.91***		-1.28***	
N	6,681	6,681	6,681	6,681

Note: * Statistically significant at the 0.10 level. ** Statistically significant at the 0.05 level. *** Statistically significant at the 0.01 level. Clustered standard errors are at the State level. Procurement sources are included in the direct marketing channel category: directly from individual producer, directly from cooperative of producers, directly from a local food processor or manufacturer, food hub, and grocery store. Sample includes SFAs that purchased local food during the 2022–2023 school year. The local food procurement policies were cumulative counts of policies at the State level as of 2023. The models were estimated at the State level and weighted using national non-response weights.

Source: USDA, Economic Research Service calculations using data from 2023 Farm to School Census; 2022 Census of Agriculture; USDA, Agricultural Marketing Service's (AMS) Local Food Directory for Farmers Markets; USDA, Food Safety and Inspection Service's (FSIS) Meat, Poultry, and Egg Product Inspection Directory; USDA, National Agricultural Statistics Service's (NASS) Capacity of Refrigerated Warehouses Summary; and the National Farm to School Network's Farm to School State Policy Handbook (2021).

Table B.2

Coefficients and marginal effects for determinants of purchasing local food directly from producers or through direct marketing channels as obtained from logistic regression models, 2022–2023 school year, excluding F2S intensity as a control variable

Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
School food authority (SFA) characteristics				
Urbanicity				
Urban (omitted)				
Suburban	0.14	0.02	-0.09	-0.02
Rural	0.66***	0.11***	0.18	0.04
SFA size				
Small (less than 1,000 students) (omitted)				
Medium (1,000 to 4,999 students)	0.01	0	-0.21***	-0.05***
Large (5,000 to 24,999 students)	0.11	0.02	-0.32**	-0.07**
Extra large (25,000 students or more)	0.19	0.03	-0.38*	-0.09*
Farm to school (F2S) experience				
Less than 3 years (omitted)				
3–5 years	0.51***	0.09***	0.21***	0.05***
6–10 years	0.65***	0.11***	0.37***	0.08***
More than 10 years	0.52***	0.09***	0.30***	0.07***
Have grants or other funding	0.63***	0.10***	0.57***	0.13***
Number of local food procurement challenges				
Availability	0.05**	0.01**	0.07***	0.02***
Procurement	0.03	0.01	0.06*	0.01*
Cost	0.05	0.01	0.11***	0.02***
Staff/kitchen	0.17***	0.03***	0.11***	0.02***
Share of student eligible for free/reduced price lunch	0	0	-0.00**	-0.00**
Full-time F2S staff				
Zero (omitted)				
1–3 staff	-0.02	0	0.03	0.01
4–10 staff	-0.13	-0.02	-0.06	-0.01
More than 10 staff	-0.57***	-0.09***	-0.33**	-0.08**
Part-time F2S staff				
Zero (omitted)				
1–3 staff	0.51***	0.08***	0.26***	0.06***
4–10 staff	0.69***	0.11***	0.53***	0.12***
More than 10 staff	0.79***	0.13***	0.57***	0.13***

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Model	(1) Procure directly from individual producer		(2) Procure from any direct marketing channel	
	Logit coefficients	Average marginal effect	Logit coefficients	Average marginal effect
Local food infrastructure				
Farmers markets per 100 people	17.25	2.88*	14.66	3.29
Food hubs per 100 people	-2.61	-0.44	43.69	9.79
Meat processors per 100 people	14.44**	2.41**	4.08	0.92
Refrigerated warehouses per 100,000 people	0.99***	0.17***	0.65***	0.15***
Share of direct to consumer farms	0	0	0	0
Share of intermediated farms	0.01	0	-0.01	0
Local food procurement policies	0.02	0	0.01	0
Constant	-3.51***		-0.73***	
N	7,508	7,508	7,508	7,508

Note: * Statistically significant at the 0.10 level. ** Statistically significant at the 0.05 level. *** Statistically significant at the 0.01 level. Clustered standard errors are at the State level. Procurement sources are included in the direct marketing channel category: directly from individual producer, directly from cooperative of producers, directly from a local food processor or manufacturer, food hub, and grocery store. Sample includes SFAs that purchased local food during the 2022–2023 school year. The local food procurement policies were cumulative counts of policies at the State level as of 2023. The models were estimated at the county level, except the local food procurement policies and the refrigerated warehouse per 100,000 people were only available at the State level.

Source: USDA, Economic Research Service calculations using data from 2023 Farm to School Census; 2022 Census of Agriculture; USDA, Agricultural Marketing Service's (AMS) Local Food Directory for Farmers Markets; USDA, Food Safety and Inspection Service's (FSIS) Meat, Poultry, and Egg Product Inspection Directory; USDA, National Agricultural Statistics Service's (NASS) Capacity of Refrigerated Warehouses Summary; and the National Farm to School Network's Farm to School State Policy Handbook (2021).