

Cultivating the Circular Economy in California:

A Snapshot of the Purchasing Power of School Meal Programs in California

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Urban Community and Health Equity Lab



The Urban Community and Health Equity Lab is based in the Graduate School of Architecture, Planning, and Preservation (GSAPP) at Columbia University. The mission of the Urban Community and Health Equity Lab is to conduct interdisciplinary research to transform institutions, policies, and practices that cause health inequities, both domestically and internationally. Specifically, its research uses a social justice framework, and is at the intersection of architecture, law, public health, public policy, and urban planning.

The issues that we research broadly include a better understanding of how the built and natural environment, economy, and law and governance ameliorate or exacerbate health inequities. Through a series of real projects and engagements with communities in the United States as well as around the world, the Urban Community and Health Equity Lab is charged with identifying health-related risk factors in the urban built environment, proposing a wide-range of planning policies, strategies, and practices that influence institutional change and strengthen democratic processes which lead towards more sustainable and equitable regions.



Through collaborative, interdisciplinary research and practice, IURD supports students, faculty, and visiting scholars to critically investigate and improve processes and outcomes that shape urban equity around the world. One of IURD's research areas is Urban Governance, which includes the Law and Governance Research Group. This research group is collectively engaged in research at the intersection of planning, environmental and land use law, and local government. The research group pursues engaged scholarship to advance IURD's mission of promoting urban equity and support informed policy making.

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INTRODUCTION AND BACKGROUND

A circular economy, broadly, is “restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times... ultimately decoupl[ing] global economic development from finite resource consumption” (Ellen MacArthur Foundation, 2015). Specifically, the Ellen MacArthur Foundation and their global network of partners have argued that the bio-cycle economy has unrealized potential to provide substantial economic benefits that could be gained by adopting more circular approaches to the way we manage organic nutrients (MacArthur, 2018).¹ The bio-economy is estimated to be worth \$12.5 trillion (17% annually of all global economic activity) (MacArthur, 2018). Within the bio-economy, the food and beverage industry is the largest sector and has “over 1 billion people working each day to grow, process, transport, market, cook, pack, sell and deliver food” (MacArthur, 2018).

The world’s population is growing at a steady pace and is rapidly urbanizing. By 2050 the global population will grow nearly 30% to 9.1 billion people, of which, nearly two thirds will be living in urbanized areas (Ellen MacArthur, 2018; Hutson, 2018; United Nations, 2014). Increased population growth will place additional pressure on the global food systems—requiring a doubling of crop production to meet the growing demand for food (Foley, 2018). As a result, many actors along the food value chain have pointed out the need to focus on developing a circular economy focused on the food systems.

Developing a circular economy around the current industrialized food system is no easy task. As of now the global food industry is not efficient and has resulted in large amounts of food waste, environmental degradation, and unhealthy outcomes. For example, approximately a third of all food produced in the world for human consumption annually is lost or wasted (1.3 billion tons), costing about \$680 billion in industrialized countries (FAO, 2018).

In addition to the food waste, the current food system is producing a number of negative externalities across the value chain such as the inefficient use of land: estimates place 50% of the world’s habitable land as being used for agriculture (MacArthur, 2018). Agriculture also accounts for 70% of freshwater consumption and current agriculture practices are creating the loss of fertile topsoil and increased fertilizer run-off from agricultural land (MacArthur, 2018). Moreover, one third of greenhouse gas emissions comes from agriculture, for example in the United States, the average ‘farm to fork’ distance extends over 1,500 miles (MacArthur 2018; Gilbert, 2012). Finally, the current food system is not producing healthy outcomes for humans. The Ellen MacArthur’s report *Cities and the Circular Economy for Food*, argues that the nutritional value of food has diminished over time as many foods contain traces of toxic chemicals and plastics. Half the world’s population is hungry or undernourished and an estimated 2.1 billion people are obese or overweight. Adding to this challenge is the fact that 60% of human infectious diseases come from domesticated animals (MacArthur, 2018).

Despite these enormous challenges, the opportunity to transform the current global food system is within reach. In some locations, large public entities and local governments can, collectively, help lead the way in this change by encouraging and incentivizing “relocalized” food systems. “Relocalized” food systems represent the type of resilient and complex approach to food systems that the Circular Economy seek to build, cultivating “economic, natural and social capital” (Ellen MacArthur Foundation, 2015). “A respected and growing body of literature argues that the presence of many, small, locally-owned and operated business are positively correlated with greater economic stability, with greater income equity and with a more robust community infrastructure” (DeLind, 2002; Goldschmidt, 1978; Shuman, 2013; Tolbert, Lyson, & Irwin, 1998).

¹ We use the definition of the bio-economy developed by the Ellen MacArthur Foundation which includes the sector of the economy that *cultivates plants, animals and fungi for food, energy, structural materials, medicines and other products to benefit humans*.

Farm to School Programs May be Able to Advance the Circular Economy

Within the United States, Farm to School Programs, for example, that support local procurement practices can cultivate (1) economic capital by increasing the net sales, creating new labor income and improving the local purchasing power; (2) natural capital through reduced CO₂ emissions, regenerative practices for land restoration and diversification; and (3) social capital through increased access to healthy food and job creation that may increase local economic activity and improve quality of life. (See Figure 1.) In this paper, we focus on the role that school districts can play in shaping the food system within the state of California.

Prior research on the impact of Farm to School programs in California suggests that there are robust opportunities in California to apply a circular economy framework to school meal programs and food systems. According to the United States Department of Agriculture's (USDA) Farm to School Census, in California, 55% of California School Districts² surveyed said they participate in farm to school activities, while another 16% of districts surveyed plan to start farm to school activities in the future. Among the California School Districts surveyed by USDA: 80% said they buy local fruits, 76% local vegetables, 54% local milk and a 20% said they buy local meat or poultry. Overall, the survey found that among respondents, the average district spent 15% of their food budget on local products, for a total of \$167,644,000 invested in local food in California.³

This Farm to School census data indicates that school districts statewide are very interested in procuring from California producers. What it does not help us understand, however, is the importance of each element of the supply chain in total and local food procurement to schools, nor does it give insight into the current barriers and opportunities for increased local food procurement. It also includes fluid milk in the analysis of local procurement, which our research interviews revealed may skew any analysis of the impact of an intervening policy, practice, or initiative.

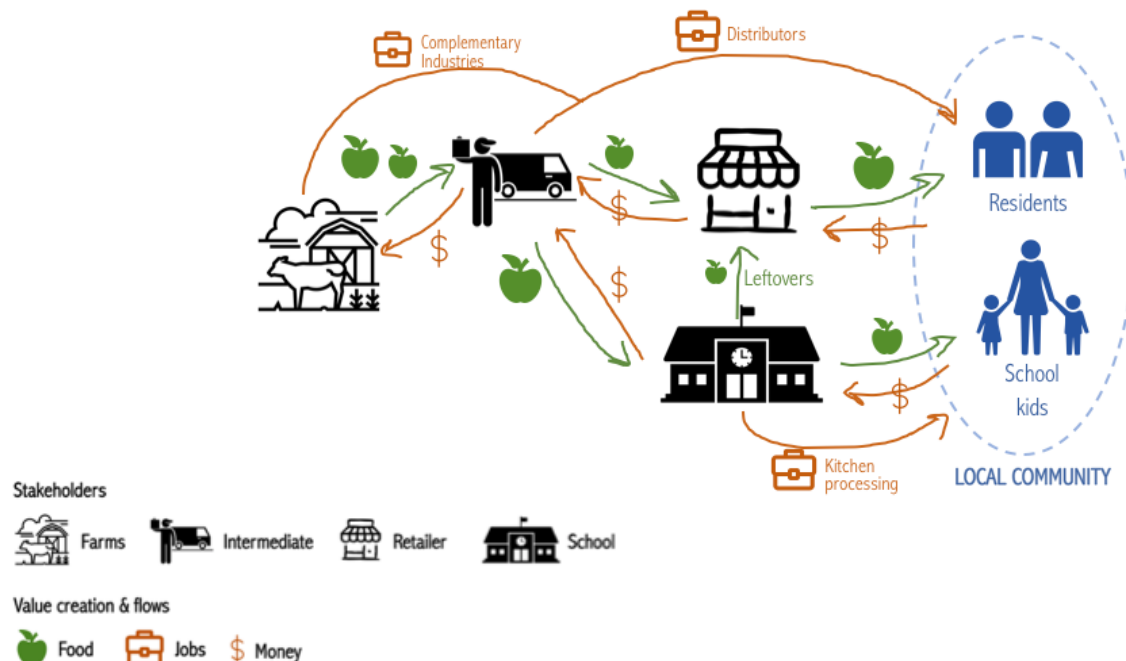


Figure 1. Circular Economy Framework

² Of the 1,045 school districts in California, 65% completed the USDA Farm to School Census. The 2015 Census population included primarily public school districts, private schools, and charter schools.

³ Rollover statistics for percentage of food budget spent on local food refers to respondents that participated in farm to school activities in school year 2013-2014 that were able to provide data on total food expenditure (excluding food donated through USDA Foods or DoD Fresh) and the total dollars spent on local food including fluid milk.



Contributing to a Circular Economy Through *Rethinking School Lunch*, California Thursdays®, and California Food for California Kids®

Among the non-profit organizations throughout California that promote local procurement and more sustainable food systems is the Center for Ecoliteracy (CEL). CEL as an organization is “dedicated to cultivating education for sustainable living.” Within this mission is CEL’s work to support school meal programs statewide that aim to improve student health, learning, and the state economy simultaneously. CEL has created multiple tools for school districts interested in school meal innovation, including the *Rethinking School Lunch* (RSL) planning framework, first published in 2005.⁴ This planning framework addresses ten interrelated pathways to sustainable school food reform that connects with the Circular Economy framework. The comprehensive nature of the planning framework simultaneously addresses the quality of the school food, the critical role of nutrition in promoting improved health and learning outcomes, the relationship between school meal programs and the local food system and local economy, the fiscal constraints most school districts are operating within (as the nutrition services department must be financially self-sustaining), and the professional development needs of staff and personnel shifting to a new model of school food operations.

Schools are a key setting for any public health strategy intended to address childhood obesity because it is unlikely that childhood obesity rates can be reversed without strong school-based policies and programs to support healthy eating (Story, Nannery, & Schwartz, 2009). School settings also provide opportunities to address food insecurity among students as the average student consumes between a third and half of their daily calories at school (Briefel, Crepinsek, Cabili, Wilson, & Gleason, 2009). RSL’s systems change approach to school meal reform is premised on the notion that no one intervention alone can increase student consumption of healthy food. Prior studies evaluating school meal waste suggest the same (Gase, McCarthy, Robles, & Kuo, 2014). RSL’s design incorporates integrating school garden programs into the school curriculums to connect students to growing fruits and vegetables (Davis, Ventura, Cook, Gyllenhammer, & Gatto, 2011; Gatto, Ventura, Cook, Gyllenhammer, & Davis, 2012; Heim, Stang, & Ireland, 2009); integrating nutrition education into the school curriculum (Guthrie & Buzby, 2002); health marketing campaigns to promote new food items (Baranowski et al., 2000; Blanchette & Brug, 2005); and using salad bars to encourage consumption (Adams, Bruening, Ohri-Vachaspati, & Hurley, 2016; Slusser, Cumberland, Browdy, Lange, & Neuman, 2007).

CEL began convening *Rethinking School Lunch* conferences in 2006 across California and across the nation to share the planning framework with nutrition services directors interested in school meal program innovations. CEL also formally partnered with the Oakland Unified School District (OUSD), beginning in 2010, to support the application of this framework to OUSD. The district’s nutrition services director, Jennifer LeBarre, was already working to reform the school meal program and the district had adopted a new strategic plan in 2009 with the stated goal of caring for the whole child and an explicit focus on student health. In 2011, OUSD and CEL launched *Rethinking School Lunch Oakland* (RSLO) with a feasibility study, funded by TomKat Foundation and the SD Bechtel Foundation, that found that inadequate infrastructure and equipment prevented school meal program innovations in Oakland in nearly every pathway and recommending significant infrastructure investments. Despite leadership transitions, OUSD’s nutrition services department personnel, with CEL staff, have made incremental changes to its school meal program using the RSL approach wherever possible, while progressing on a central kitchen facilities project.

At the same time CEL began its partnership with OUSD, CEL and the TomKat Foundation jointly launched the California Food for California Kids suite of programs in 2010. This work included convening statewide conferences with school food service directors, publishing the cookbook and professional development guide *Cooking with California Food in K-12 Schools*, and the report *Are California Kids Eating California Food?* Another critical milestone is the emergence of California Thursdays in 2013, an attainable implementation strategy created by CEL and OUSD during joint menu development work while implementing RSLO. California Thursdays offers an achievable first step into the *Rethinking School Lunch* systems change for school districts interested in school meal innovations.

⁴ Available at <https://www.ecoliteracy.org/download/rethinking-school-lunch-guide>

CEL, through California Thursdays, has supported the creation of a statewide network of school districts committed to freshly prepared meals made with California-grown food, including nutrition services directors, program staff, district leadership interested in school food innovations, and links to producers and distributors that currently supply or are interested in supplying food to school programs. This network connects through multiple channels, including: conferences, trainings, promotional events, a members-only website with resources, and a listserv. The Network has quickly grown from 15 sites in 2014 to 71 in 2017. Participating districts are located in 28 counties and working to provide school meals to over 1.8 million students that are California sourced whenever possible, catalyzing innovations in procurement practices, menu development, and school meal program marketing (to name a few) to spread across California. The 2017 UC Sustainable Agriculture Research and Education Program Policy Brief “Strengthening California Farm to School Programs” identified California Thursdays as a program that can “help increase local procurement by raising awareness and promoting healthy, local foods to parents and children (Wade & Feenstra, 2017).

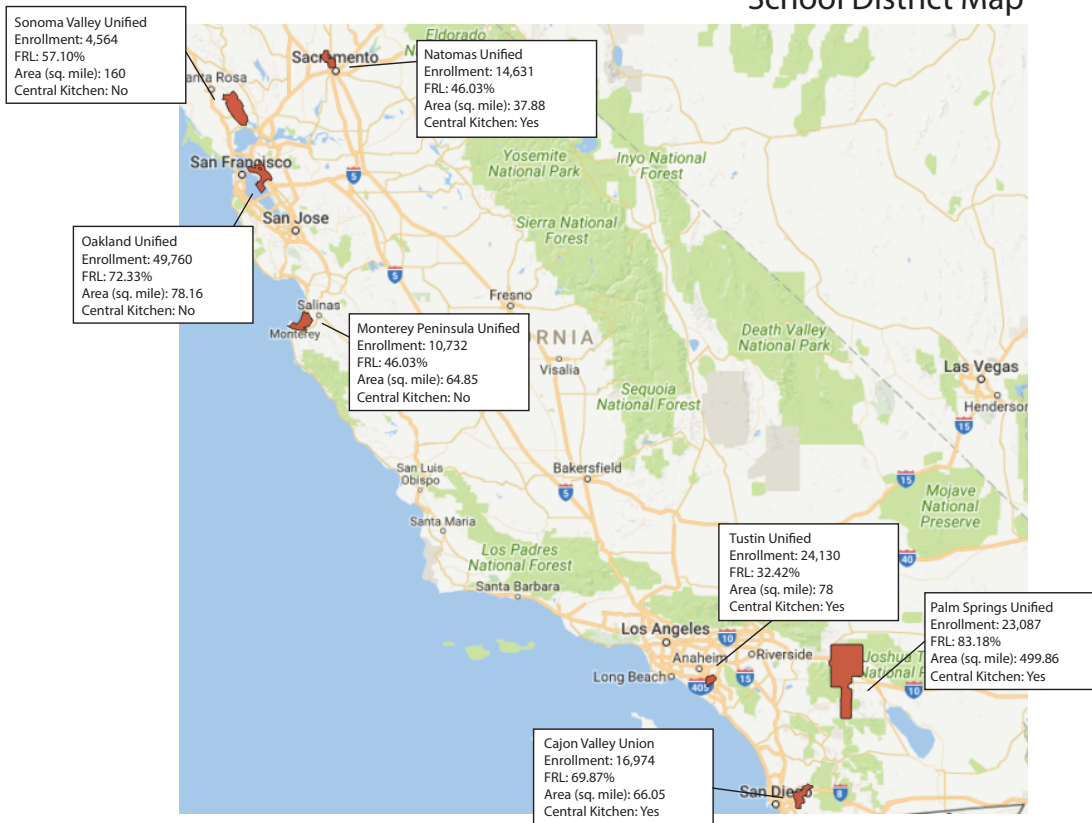
RESEARCH APPROACH

Building on the research of others that measure the economic impact of farm to school programs (Becot et al., 2017; Haynes, 2009; Paggi, 2011), we began with the premise that the California public school meal programs participating in the California Thursdays network present a significant opportunity to generate economic growth, create jobs, and reduce the environmental impact of a local food system. We pursued case study research to explore this premise by choosing districts participating in this network for deeper analysis, knowing at the outset that all participating districts within the network are interested in increasing their procurement of California ingredients at varying levels. Our goal was to better understand what conditions create increased opportunity for to procure more California ingredients, and what obstacles to increased procurement of California ingredients remain even in districts that aim to procure California food, so beginning with districts that have demonstrated an intent to increase procurement of California food (through their participation in the network) was a necessary first step.

To recruit participant school districts and gather necessary procurement data within eight weeks, we examined all 71 school districts within the California Thursdays network and identified a subset of districts that were using a single school food distributor for grocery items. We grouped that subset of districts by size (enrollment, geographic area), location within the state, characteristics of location (rural, suburban, urban), percentage of students qualifying for free or reduced-price meals, and current infrastructure (central kitchen versus no central kitchen). We then selected ten possible participants from a pool of nearly 38 potential study participants that would allow for diversity across school district criteria (a range of sizes, locations, and percentage of students qualifying for free or reduced-price lunch), diversity across implementation of school meal innovations, but consistency across specific procurement practices (by using the same broadline school food distributor that aims to increase transparency and sourcing/origin information in its ordering system). Seven very different school districts across the state agreed to participate, although their ability to provide procurement data within the short time-frame varied. The participant school districts are different sizes in urban, suburban, and rural locations throughout the state, with different school kitchen facilities. Total district enrollment and percentage of students qualifying for Free or Reduced Meals comes from CDE’s Data Quest.

These Network participants use the “whole plate” approach to shift procurement towards California ingredients. To describe how each of the study districts participating in California Thursdays are procuring ingredients from the California agricultural sector (Swenson, 2007), we conducted initial analysis of each district’s procurement data found in usage reports and individual invoices, including point of origin information (where available through internet searches and/or distributor or producer self-reporting), to determine 1) how much of all of the food purchased by the participating school districts is California-sourced; 2) the importance of each type of supply chain; 3) how much California produce districts are procuring through the DoD Fresh program; and 4) how much California-sourced processed or manufactured food is purchased through distributors, and 5) the importance of the role played by distributors. Complete data sets are still pending for three sites, so we could not process procurement data for all seven sites. We did not attempt to independently track point of origin information for any USDA foods.

School District Map



Map 1. School District Map

In addition to gathering data from a subset of California Thursdays participants, we wanted to explore the feasibility of a statewide economic impact study that measures the full impact of shifting procurement practices to purchasing California food for California kids, and a study that explores the capacity of California school districts to contribute to transforming local food systems from a linear “make-take-dispose” system to a circular “restorative-regenerative” system. We define economic impact as the net change in new economic activity associated with an industry, event, or policy in an existing regional economy and economic contribution as the gross change in economic activity and economic benefit as a net increase in total social welfare (Gertler, Martinez, Premand, Rawlings, & Vermeersch, 2016). Impact assessments target the chain effect of linked purchases within California in the short term. The more businesses or industries within the California economy that are purchasing from each other, the stronger the inter-industry linkages. The long-term research goal is to understand how school meal programs implementing changes in procurement to purchase California food ripples through the existing linkages (Meter & Goldenberg, 2015).

We were able to gather procurement data, excluding fluid milk,⁵ from six school California Thursdays districts, gaining access to complete procurement data sets from four districts and near complete sets from an additional two districts. We also conducted interviews with 39 voluntary participants comprised of district leadership and nutrition services personnel from seven districts, producers, NGO support organizations, and school food distributors.

⁵ We excluded fluid milk from this analysis because all of the participating districts have a practice of purchasing milk that is produced within the state that predates efforts to increase procurement of California ingredients or participation in California Thursdays. Because this study seeks to understand the opportunities and challenges of shifting towards increased California procurement, including procurement of fluid milk would likely skew the overall analysis and obscure components of a school meal that have the greatest potential for improvement (measured by increased California sourcing).

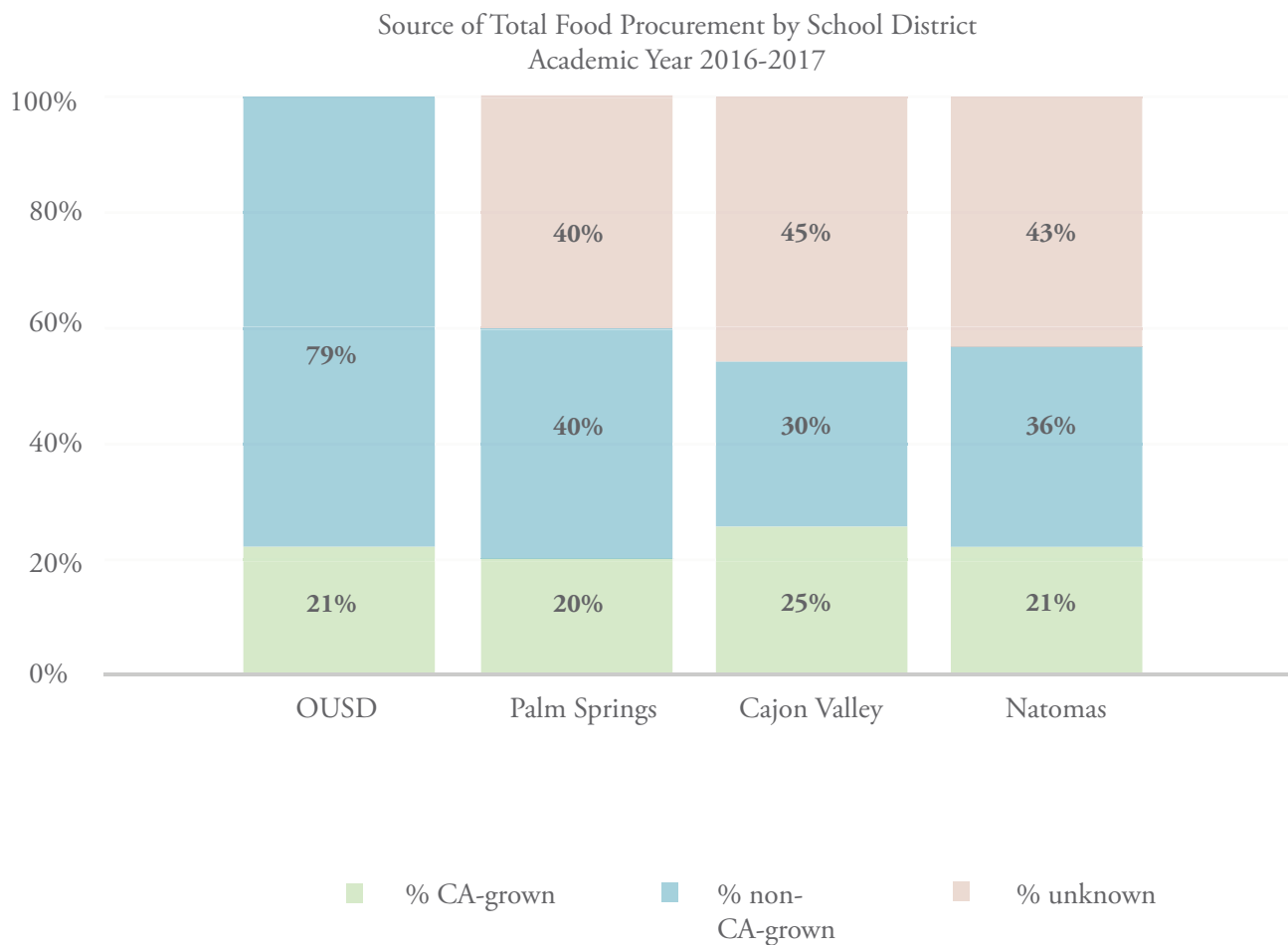
WHAT WE DID LEARN?

1. These districts are procuring more than 20% of all school food from California.

The four districts for which we have complete data sets procured more than 20% of their food (excluding fluid milk) from California growers in the 2016-2017 academic year. (See Graph 1.) That percentage jumps up by as much as ten percent if we include fluid milk. Federal regulations, seasonality, and student preferences, district operations and limited infrastructure and equipment present challenges to increasing procurement California food, generally, but each of these districts are implementing innovative solutions to address these challenges.

While we do not have a direct comparison across the state with Farm to School districts, this data still indicates that these districts may be procuring California food at a rate higher than the average district participating in Farm to School programming.

GRAPH 1. TOTAL PROCUREMENT, EXCLUDING FLUID MILK



Notes:

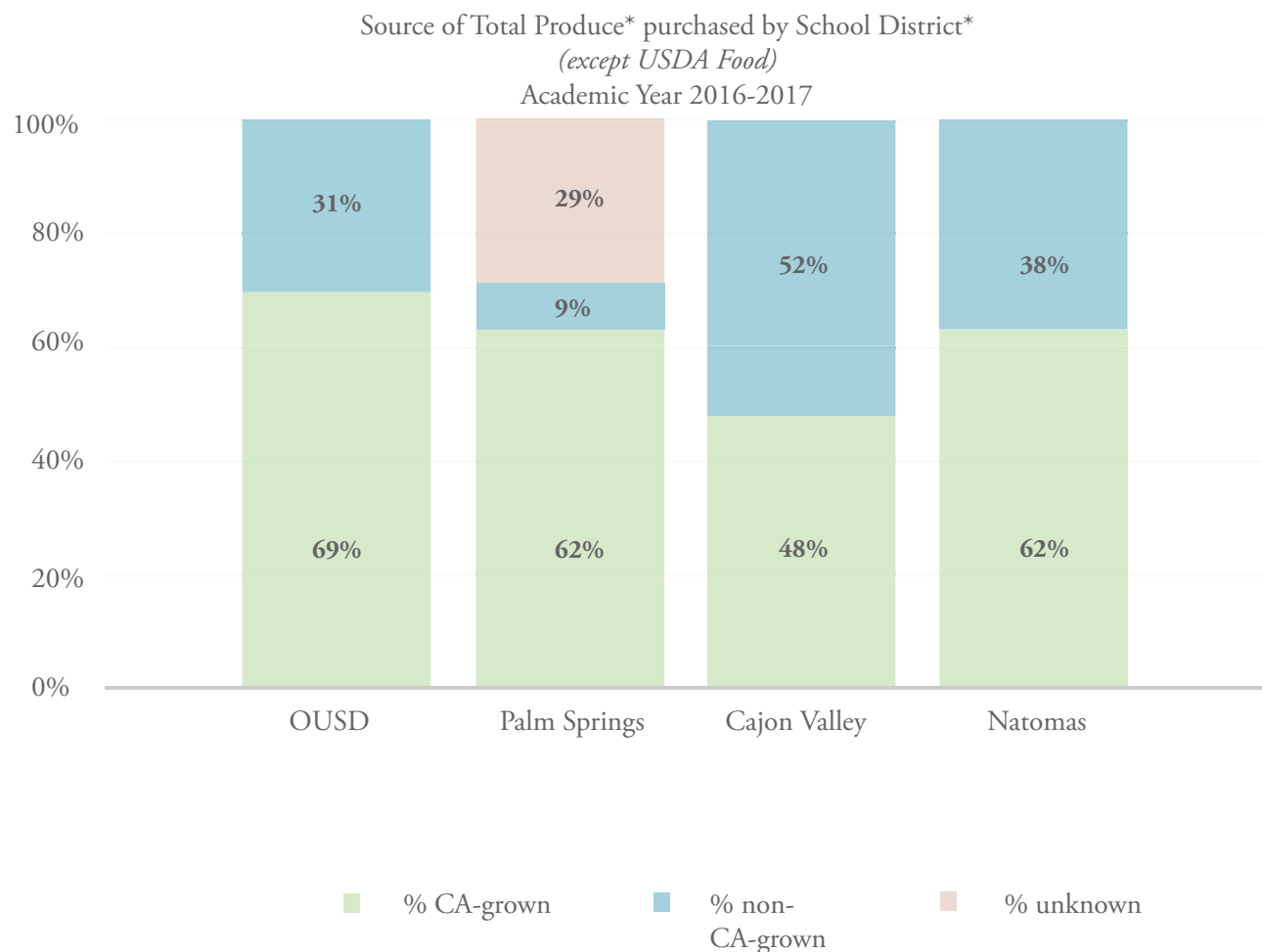
Origin of total food procurement by school districts, excluding fluid milk. This includes non-produce items and produce, including produce purchased directly, through distributors, or through the DoD program. % unknown is the food purchased through the USDA Food program, including commodities and brown box items. Points of origins were determined by cross-referencing DoD purchases and California Thursdays product list for each district.

Sources:

School districts' spending, distributors' invoices, Gold Star Foods detailed bills-to-customers, DoD tracking.

This requires more research. The 2015 USDA Farm to School Census Report datasets provide that the average school district participating in Farm to School programming in California spent 15% of their total food budget on local products, with that percentage dropping to approximately 5% after excluding fluid milk, in SY2013-2014. The Farm to School data set is built on self-reported procurement dollars spent on local food, with local being defined to include different categories of local (including statewide), from a different school year, and excludes produce from the Department of Defense Fresh (DoD Fresh) program.⁶ Our analysis looks at statewide procurement, does not rely on districts self-reporting totals, although DoD Fresh produce comprised a small percentage (or no percentage) of the California sourced food for each district. OUSD does not use the DoD Fresh program, Natomas procures less than 3% from DoD Fresh, PSUSD less than 5%, and El Cajon procures less than 7% of their food through DoD Fresh (see Graph 2). Lastly, although the average calculated in SY2013-2014 could have increased over time in the SY2016-2017 for participating districts, we also have access to The Center for Good Food Purchasing's analysis of procurement data for at least one district—OUSD—that compares SY2012-2013 and SY2014-2015. Since SY 2012-2013, OUSD has consistently procured approximately 30% of its food from California (including fluid milk).

GRAPH 2. TOTAL PRODUCE, EXCLUDING USDA FOODS



Notes:

Origin of Total Produce Purchased by School Districts, academic year 2016-17, excluding USDA Foods. It includes produce bought through the DoD program, direct purchases, and distributors. It excludes produce bought through the USDA program (brown-box and commodity items).

Sources:

Trinity Fresh, Ag Link, Pro Pacific Fresh invoices for Natomas, academic year 2016-17; Daylight Food, Capay, Pacific Rim invoices, Top 10 Produce, Marie Farms Fresno, Coke Farms for OUSD, academic year 2016-17; Diamond Jack, DoD produce through Gold Star Foods invoices for Cajon Valley, academic year 2106-17. Origins for DoD produce were cross-referenced based on the DoD invoices from Cajon Valley. Natomas currently uses the Unprocessed Fruit and Vegetable Program

2. These districts are procuring substantially more California produce than other types of food (excluding fluid milk).

These districts are procuring California-grown fruits and vegetables at a much higher rate—with all districts procuring more than 48% and up to 69% of their produce from California—than other types of food. (See Graph 2.) Combined, these four districts spent more than \$2.3m on California produce in SY2016-2017. All districts aim to procure as much California food as possible, but multiple participants stated that procuring non-produce items aside from fluid milk (particularly proteins) is very difficult. Participants explained that procuring California food (excluding fluid milk) often requires initiating/building relationships with California producers to bring them into the school food supply chain.

3. Capacity to process and prepare fresh foods (scratch cooking) is essential to increasing procurement of California food.

Participants described increasing a district's capacity to process and prepare fresh foods (scratch cooking) as essential to increase procurement of California ingredients. Federal reimbursement rates have not kept pace with rising labor and food costs and are too low to encourage procurement of California food without operational shifts to support scratch cooking. If a district serves primarily prepared or processed foods, the food's point of origin information is difficult to obtain. All but one of the district participants rely heavily on USDA commodity foods to stay within budget, which do not provide point of origin information. Non-USDA processed food items also present similar challenges: "Many times the manufacturers themselves aren't able to track or know where their ingredients come from."⁷



Figure 2. Goals for increasing procurement of California food.

4. Providing fresh meals made from California food appeals to students and families, and may also yield better revenue streams for nutrition service departments.

Participants stated that scratch cooked meals from California ingredients as more popular among students and families, even increasing voluntary participation and leading to contracts to prepare and serve meals to local charter schools or childcare centers, providing yet another source of revenue. District study participants with central kitchens and well-trained staff explained that the up-front costs of infrastructure, equipment, and professional development to transition to scratch cooking made good financial sense over the long-run because it gave the districts more ability to save money in food costs through in-house processing and scratch cooking. Districts with high percentages of students qualifying for free or reduced-price meals credited increased participation across a range of meals (including breakfast, supper, and snack) and increased revenue through reimbursements to these operational shifts, whereas districts without central kitchens expressed that they faced limitations in being able to meet the increased need for supper programs because of infrastructure and equipment limitations. More research is needed to understand the impact of each of these operational shifts on department finances and student consumption of healthy school meals.

⁶ This data is available at <https://farmtoschoolcensus.fns.usda.gov/home> by accessing the state and national level summaries data set.

⁷ Unless otherwise noted, all quotes used within this report come from research interviews with the subjects in this study.

5. A district's capacity to produce fresh meals, and increase procurement of California ingredients, within the current regulatory structure, has a direct relationship to the district's infrastructure, equipment, staff, and menu development.

Spending more money on California-grown products (as opposed to USDA commodity products) requires operational shifts. All districts agreed that the long-term solution to increasing California-grown products in the program requires more food processing and scratch-cooking in-house. But this requires equipment and infrastructure to support on-site processing or cooking of raw ingredients, professional development of current staff, or the hiring of culinary and other staff to process more fresh foods or develop new menu items.

Equipment and Infrastructure

Multiple participant districts described physical infrastructure and/or equipment needs are some of the most common and significant limitations obstructing efforts to increase procurement of California ingredients. Interviews revealed infrastructure needs spanning from construction of a central kitchen in some districts, to the need for high-volume food processing equipment, pizza racks, or increased storage and refrigeration in others. Infrastructure relates to California procurement in multiple ways: it allows districts to purchase and process more raw product, which allows them more opportunity to choose California-grown; being able to purchase in larger quantities allows districts to take advantage of direct buying and bulk orders that save money, allowing them to invest in other higher-quality, higher-price locally sourced ingredients; and specific equipment is required to expand menu items and increase participation rates.

Because of the various equipment and infrastructure limitations participants faced, the early adopters (Rogers, 2003) that led these districts found creative solutions that allowed them to increase procurement of California-grown foods, some even while building facilities, or without the ideal facilities. Several districts pursued bond measures and built central kitchen facilities five years ago. Others without central kitchens have introduced new cooking methods, or utilized improvised kitchen or storage facilities. Despite achievements with limited infrastructure, several participants identified infrastructure and equipment as key to their ability to shift more procurement dollars towards California-grown foods. One study participant in a district without a central kitchen, working with what they called a “pack out kitchen,” spoke about the benefits they expected to gain from investment in physical infrastructure: “We always have to take into consideration what we’re allowed to do in our space and within our confines of the equipment we have available. The central kitchen would solve that concern, in that we would have a larger space, better equipment, and we will be able to actually implement a system of scratch cooking that allows us to better control the quality of the food that we serve and the ingredients that are going into the food... We are having to take certain shortcuts... [For instance,] we are taking a burrito that is already composed and turning it into a wet burrito but because we didn’t make that burrito, we’re kind of stuck in term of what those ingredients are.”



Figure 3. Steps to increase procurement of California-grown foods.

⁸ Two of the authors have separately confirmed that students and families in one participant district, OUSD, preferred fresh meals and led to increased voluntary participation at school sites with low percentages of students qualifying for Free or Reduced priced meals in other related research (O'Neill, Mujahid, Hutson, Corburn, & Fukutome, 2016).

⁹ Of the seven districts we interviewed, two had successfully secured bond financing to develop a central kitchen, one was in the process of building a central kitchen (after having secured bond financing,) and three did not have central kitchen facilities.

Analysis of procurement data confirmed that sourcing of California non-produce non-fluid milk items is relatively low. As the prior quote suggested, participants felt that transparency of origin is an issue for procurement of non-produce non-fluid milk food items (especially those that are more highly-processed) even when they are procured from distributors that make a concerted effort to identify product origin. Variability across the districts in terms of capacity to process and cook raw ingredients, along with reduced opportunities for procuring proteins from California increases reliance on processed food items that may be more difficult to source in California. These findings suggest that without increased transparency of sourcing in the food chain, California producers and manufacturers may be at a competitive disadvantage in terms of the stated intentions of school districts related to their bids and procurement expenditures.

Operations and Process

District participants also reported that after an initial investment, when a district has the capacity to create scratch cooked meals, it not only contributes to food quality and control over point of origin, but pays off financially. “When you can buy things in bulk, you can buy things fresh [and] it tends to be a lot less expensive than having to buy things that are already processed, which is where we are at right now because of space and equipment limitations.” One participant with a functional central kitchen confirmed: “Cooking from scratch from a financial perspective is just cheaper. If we’re able to keep the dollars in house, and pay our staff, it’s easier and cheaper than [sourcing] it out to a manufacturer.” Other district participants with central kitchens echoed this same observation.

The economic benefits to this expanded capacity to scratch cook and procure locally go far beyond the particular nutrition services department that makes these investments, particularly for districts located within areas with strong inter-industry linkages in the agricultural sector. A preliminary shift share analysis indicates that locations with stronger inter-industry linkages in the agricultural sector will allow one dollar spent on local food to circulate more frequently through the local or regional economy, creating a higher multiplier effect.¹⁰ For example, Monterey Peninsula Unified in Monterey County, is a district located in a county with high inter-industry linkages in the agricultural sector. The geographical location of this district will likely increase the multiplier effect of any procurement dollar spent on local food. If Monterey Peninsula implements continued operational shifts in the form of infrastructure changes (to increase storage and capacity to process raw ingredients and scratch cook), this combined with the district’s geographical location suggest that procurement dollars spent on local food will have a comparatively high multiplier effect.

Another infrastructure limitation that multiple participants identified was the poor school site kitchen and cafeteria facilities. In some districts operating with a central kitchen, school site kitchen/cafeteria limitations do not allow for any prep on site, or the ability to serve hot food on a tray. Participants reported that these limitations contributed towards negative perceptions of the food, which had to be packaged off-site even if it was scratch cooked, impacting student consumption and voluntary participation in the meal program. As one participant explained, “The central kitchen, the staff here, and the chef . . . do an amazing job at cooking things from scratch and we’re able to provide a really clean product, but [when] you put it into a package that looks like it’s straight out of the freezer section of the grocery store, it sends the wrong message to the community and to the students . . . we were negating all of our hard work because no matter what we do here in the central kitchen, if we put it into a package that people equate with a high process, high sodium content, high calorie content product.” Participants with tray service in place confirmed this, and for participants without tray service at all sites, the introduction of salad bars has confirmed for them that tray service would improve student response and decrease costs. “As soon as we put in the salad bars, my plate cost went down about 10 cents a serving [due to reduced food waste] and students were actually eating the fruits and vegetables they were taking.”

If a district does not already have this operational infrastructure in place, these costs may have to come out of a department’s limited budget as most districts will not provide resources from the general fund to transition school meal operations. In some circumstances, districts can pursue bond financing to support kitchen infrastructure improvements (the building of a central kitchen, increased storage, or school site kitchen upgrades that permit tray service, for example) but that is contingent on leadership awareness of what these types of investments can do for the school meal program, pursuing that as a strategy, and the electorate passing a bond measure.

Human Resources

Professional development is another obstacle that continued to limit the districts' ability to increase California procurement. In some districts, a major cultural change was needed within the nutrition services department when directors attempted to shift school meal programs toward scratch cooked meals utilizing California ingredients, as staff had been accustomed to years of heat-and-serve. This required developing relationships with labor negotiating units, investments in training in new cooking techniques, and generally getting staff on board with the changes. Several directors related difficult learning experiences in which they asked their staff to make a number of changes at once, leading to discontent within the department. Even those that have been successful in significantly reforming their school meal programs still spoke about the need to continue to make incremental menu changes that their staff can manage at their current level of training and plan to continue investing in professional development, which they saw as a barrier to further increasing scratch cooking and California procurement. We also heard, however, that NGO support organizations and vendors can help support shifting staff culture to one that is proud of the scratch cooking they do by providing the training needed to prepare raw ingredients and cook new menu items.

6. Federal regulations, seasonality and student preferences present challenges to directly procuring from California producers, but relationship building between districts and producers, the introduction of supply chain solutions, and school kitchen infrastructure improvements can increase direct procurement and produce market solutions to food waste.

Both school district and producer study participants (vegetable and fruit farmers, and fish, beef and chicken producers) described several obstacles to school districts nutrition services departments' procuring directly from California producers. The first, seasonality, is a common obstacle to increasing California grown items. School and student preferences for items like bananas, apples, and tomatoes all year-round limit California procurement broadly. Shifting this dependence not only tests students' preferences, but requires increasing knowledge on the part of nutrition services staff about possible substitutions and menu development around seasonal availability.

Second, districts engage in menu planning many months in advance and have some inflexibility around substitutions. We found that some districts perceive that this prevents sourcing directly from producers that have specific localities and harvest schedules, since school nutrition services personnel would have to adapt to some level of unpredictability that is extremely hard for most districts to accommodate given their communications channels, storage, budget and scheduling limitations. We also heard, however, that other districts are working directly with producers and distributors focused on sourcing California food on menu planning and potential substitutions to accommodate inflexible operations and the need for advance menu planning.

Third, given that nutrition services departments operate best on routine and efficient systems, the time and communication required to make direct-buying relationships work requires significant commitment on the part of leadership. We heard that school district relationships with large distributors generally require less communication and result in routine and frequent ordering and delivery schedules. In contrast, as one participant described, communicating with producers directly "is not efficient and can be a significant time investment communicating back and forth... on pack size, weight, etc. Then communication on the other side, with nutrition services kitchen staff requires more time. Because they aren't a regular part of nutrition services operations, incorporating irregular deliveries from producers requires making sure staff understand what is coming when." We also observed, however, that multiple districts pursued relationships with California producers to help incorporate California sourced food into their meal programs even if they did not buy directly from the producer (but instead used a distributor).

Fourth, whether direct suppliers of fruits and vegetables can provide sufficient quantities still remains a common concern among participant districts that are not currently purchasing direct, or do so in very limited quantities. Similar to the limitations around seasonality, school districts' who perceive that planning, inflexible service requirements, and substitutions are inconsistent with the scale and unpredictability of small fruit and vegetable producers' supply are more inclined to go through a distributor. They also perceive it is infeasible for most producers—even of moderate size—to provide adequate delivery service for districts that do not have a central kitchen, or their own delivery transportation. Producer participants confirmed that it is typically infeasible for producers to deliver to multiple locations, whereas larger distributors are often set up for this situation, and it is part of their bid.

¹⁰ A "shift-share analysis" allows us to observe the trends in aggregate employment changes in food-related sectors overtime based on data from the American Census Survey. This allows us to 1) have a better understanding of the specificities and differences in terms of economic advantages or disadvantages across the different regions of our case studies; and 2) understand the trend in employment changes that the producers, distributors and processors included in our study might experience as well.

Fifth, many producers and district participants perceive that federal serving size regulations combined with most nutrition services departments' limited processing capacity make it less convenient for schools to purchase raw product in many cases, or product that is larger or smaller than their required serving size. Serving sizes require producers/processors to invest in calibrating their processing equipment to accommodate new specifications. This is an opportunity cost not all producers/processors may want to incur. We did, however, also hear from producers and processors that where nutrition services leadership build relationships with these producers and processors, this encourages at least some vendors to incur those opportunity costs—particularly when it appears likely the initial relationship will lead to multiple districts within the California Thursdays network statewide procuring from that producer.

And finally, bidding presents another obstacle to direct purchasing from California producers. One aspect of this is that within the competitive bid process, it is extremely hard for direct suppliers to compete with large distributors. In addition, many districts' bids are put out inclusive of many product categories, so while many of participant districts put out separate bids for fruits and vegetables, others group their grocery items with produce, making it impossible for suppliers to bid that provide fruits and/or vegetables alone.

Two particularly promising opportunities arose from participant interviews that not only respond to most of these challenges but demonstrate how school meal program procurement can create a market solution that avoids food waste. The first is that although price and serving size present a problem for many products and producers, they present an opening for others. One scenario includes producers that can provide a product that may not be valued highly in traditional markets. For instance, several producers were able to sell small fruit, or those with small blemishes that would be hard to sell elsewhere, providing districts with an extremely high-quality product at decreased costs. Similarly, when schools are able to purchase during the peak of a locally-produced fruit or vegetables' season, they are often able to get product at a price that beats that of large distributors. These distributors' sign fixed bids with schools that price produce according to an average cost and cannot reflect the most affordable scenario when a product is in season and plentiful. Several participants supplying California ingredients to districts spoke about the benefits to their business of peak-season purchases: "It was useful this year to be able to [sell to the district because] there's two times a year where a lot of our trees are ripe and we have more larger quantities than we can usually sell. And so this year we were able to not waste any fruit because we were selling to the school district, which we really appreciated." A similar opportunity exists for meat and fish suppliers that may have product that has no traditional market—or the market that exists but undervalues the product—while it is well-suited to school meal programs' needs.

The second opportunity lies in aggregation of small growers' products through a third party distributor that understands and manages the complex requirements and limitations of nutrition services departments and farmers alike. One such business identified themselves as a 'supply chain solution' and this term aptly describes the work that several participants are doing to overcome communication, quantity, transportation and capacity limitations that sometimes stymie direct relationships between producers and schools. Harnessing these opportunities appears to require deepening relationships between districts, producers, and distributors all committed to serving California students California food to identify these opportunities.

7. Dynamic leadership and establishment of a district culture committed to California procurement plays a substantial role in encouraging school meal program innovation.

Importantly, the participant school districts implementing school meal innovations all possessed nutrition services directors that were committed to reforming their school meal programs. Their inspiration and motives for this work varied from district to district with student health and academic achievement being common to everyone. Their skills and approaches varied based on their prior work experience and training, as well as their particular motivations. Nonetheless, in most cases, school meal reform was newly initiated at participant school districts with the current nutrition services director, and in all cases, it appeared reform would not likely have happened without them.

In several districts, support also came from district administrators and board directors who became advocates and supporters of the innovations nutrition services directors made over time based on proven successes. These districts have the benefit of collaboration between nutrition services, superintendents and board members resulting in strategies to fund infrastructure projects, commit district resources to marketing, and develop district efforts to integrate farm to school concepts across district departments.



A significant challenge all district participants faced at some point in their school meal reform processes appears to be marginalization of the nutrition services departments within district culture as a whole. This issue appears to persist in spite of significant reforms. Separation of school meal program operations from other district functions may contribute to this issue. Nutrition service departments' must function financially independent of the rest of their districts' operating budget, and are subject to distinct regulations. Study participants also described what appeared to be a disregard among some colleagues for the significance of the school meal program as a core responsibility of what schools deliver, particularly when the meal program faces persistent perceptions of poor food quality (which may have little relationship to the current quality of the school food). As one participant recounted: "I met with a group of teachers the other day who told us that our food was crap, and they had not been in any of cafeterias in years. I suggested they walk in and look at what's actually being served. We have low-sodium... calorie restrictions, whole grains, and fresh fruits and vegetables. They were shocked when I told them that." Some of these explanations reveal deep-seated associations of poor quality with school food that participant districts are working hard to overcome by marketing and outreach to school district staff.

Study participants also explained that marginalization of school meal programs can also occur when focus on academic performance within the district is decoupled from student nutrition, or a general lack of resources and time throughout a district limits the ability of the district to focus on improving school food. One study participant in district leadership elaborated on these challenge by explaining that administrators have many competing priorities and unlike many other aspects of school district performance, they are not judged, or rewarded for, school meal reforms. As a result, other pressing needs take priority and it is challenging for even supporting administrators to prioritize school meal innovations given the demands of competing priorities. This marginal position, however, may hinder a department's ability to make the infrastructure and professional development investments that allow districts to produce more scratch cooked food with California-grown ingredients.

Several study participants also explained that the marginalization that they perceive to be common to many districts has changed over time for several of the study participant districts, resulting from and contributing to further department innovations. For example, one nutrition services department hired a wellness coordinator to work with the school district community around menu development, seeing participation in events like a district health fair increase tenfold. Another participant recounted the progression from their department's marginalized position within the district when they began their work with the district six years ago, to a prominent position in which board members request catering from the department, and district staff wear California Thursdays shirts. Marketing support from the California Thursdays Network, positive local media attention, numerous awards and national attention on the district's programs, and discernible improvements in scratch cooked food prepared with local ingredients were important elements of this shift. Now the district's nutrition services director has enthusiastic support from district leadership, which allows the department to pursue new programs and opportunities.

What Could State Policy Do Now?

Although more research on this topic is needed (see below), state level policy shifts could support districts interested in increasing procurement of California food right now. As a starting point, state level policy could create economic incentives for districts to pursue the infrastructure development necessary to transition to more scratch cooking. Some districts have pursued bond measure financing, but not all districts can depend on this to support construction of the necessary facilities. Alternative infrastructure funding mechanisms could be similar to Proposition 39 (CA Clean Energy Jobs Act, 2012), which funds energy efficiency and retrofit programs for public schools. Or the state could develop a 0% (or low interest) loan program to fund construction of key facilities.

To respond to the persistent marginalization of school meal programs within school district operations, the state could also develop incentives for non-nutrition services district leadership to set goals around improved school meals. Currently, state priorities in their Local Control and Accountability Plans do not include the quality of the meals. The state could consider alignment with the "Basic (Conditions of Learning)" priority and create mechanisms that allow schools to "get credit" for their good work to increase fresh food and procurement of CA-grown.

The state could also focus on eliminating obstacles to connecting districts to small farmers by creating or funding programming to help small farmers meet food safety and insurance requirements to sell to schools. Another direct mechanism to supporting increased California procurement would be increasing reimbursements for school meals. Interviewees noted that even 10 to 15 cents would make a significant difference in the ability to increase procurement of California food.

With respect to current incentives to transition to scratch cooking, the state could consider simplifying the application process and grant reporting requirements grants for equipment purchases and professional development. Some study participants reported that it is particularly difficult to monitor the amount of personnel time spent on applying for or implementing the grant. They also noted that not all districts are equally positioned in their ability to apply for grants because of staffing limitations. Providing support for grant application process through recorded informational sessions (accessible via the web), and guidance documents that provide example applications, could help accommodate these districts.

Finally, the state could also consider supporting NGO intermediaries that aim to increase demand at the school district level for California food through assisting districts with marketing and communications through grants, creating economic incentives for aggregators or other supply chain solutions that aim to link smaller producers with school meal programs, and creating economic incentives for distributors to voluntarily increase transparency on point of origin information.

Future Research is Needed

More research is needed to understand how to transition California's school food system to a circular economy, which would lead to cascading benefits for the people of California. Priorities for more research include collecting more data from substantially more districts within the California Thursdays network of 71 diverse districts in 28 counties on local policies and practices that have allowed these individual districts to increase procurement of California food, despite fiscal, regulatory, and student preference limitations.

Another important priority for research includes answering whether districts within the California 'Thursdays' network on average are procuring more California food than districts outside of the network that participate in farm to school programs, and what economic impact these network districts are having on the state's agricultural sector. A full economic impact study would potentially answer this question and also help California policymakers better understand the opportunity presented by shifting more of the state's \$2+ billion in school meal spending towards California procurement.

Such studies are feasible, but timing of participant recruitment and data collection matters. Several participants we contacted were willing to participate in research, but we also found that they have limited time and resources to support data collection. Participants need fair warning, and complete data collection and processing may take several months, or longer, because the required data is not always held in one location or by one entity.



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