Previous Page: Rodney Taylor, Food Service Director, and students pose with bounty from the Emerson Elementary Garden, Riverside, CA. Photo by Riverside USD.

Above: Asheville City Schools Child Nutrition Director, Beth Palien, prepares an assortment of local fruits and veggies for students at Hall Fletcher Elementary. Photo by Molly Nicholie.

III. Review of Farm to School Evaluation Literature

Of the more than two thousand farm to school programs operational in 2008, only a few have been evaluated thus far. We reviewed and collated information from 38 resources including evaluation or program reports and articles representing a total of 23 programs. Information was also collated from other farm to school related publications and resources, with the objective of finding commonalities and trends that could be cited as impacts of the farm to school model. The 38 reports and evaluation findings included in this review met our definition of farm to school: conducting local purchasing in addition to one other component of farm to school, and which had evaluation data available through reports released before July 2007. Table 2 provides a list of the programs included and the categories under which data has been cited from these programs.

We acknowledge that there may be programs meeting the above criteria that we were either unaware of or were unable to track and include in this report. However, the 38 program reports and evaluations selected and cited in this publication represent a variety of evaluation methodologies employed by farm to school programs across the country. The findings have been described based on the evaluation categories established in the previous section. A brief program profile highlighting information relevant for understanding the evaluation findings is presented for each program cited (see Program Profiles).

Table 2: Program profiles and evaluation outcomes highlighted in this report

Abbreviation: Farm to School Program or Report	Page # in Appendices	Student Impacts (Knowledge)	Student Impacts (Attitudes)	Student Impacts (Behaviors)	Teacher Impacts	Policy Impacts	Food Service Impacts	Farmer Impacts	Parent Impacts	Community Impacts
AES-OR: Abernethy Elementary School Farm to School Program, Oregon	61		X	X			X			
ASA-NC: Appalachian Sustainable Agriculture Project's Farm to School Program, North Carolina	62						X			
BLP-OR: Bend La-Pine Farm to School Program, Oregon	63						X			
BTV-VT: The Burlington School Food Project, Burlington, Vermont	64		X	X	X		X	X	X	X
CLP-CA: "Crunch Lunch" Program, Davis Joint Unified School District, California	65			X			X	X		
COM-CA: Compton Unified School District Farm Fresh Salad Bar Program, California	66			X			X			
CON-NH: ConVal Farm to School Program, New Hampshire	67						X			
CSA-CA: CSA in the Classroom Program, Los Angeles Unified School District, California	68				X		X	X		
DWM-CA: Davis Joint Unified Waste Management Study, California	69						X			
ESY-CA: The Edible Schoolyard, Berkeley, California	70	X		X	X					
FFF-IL: Fresh from the Farm Program, Seven Generations Ahead, Chicago, Illinois	71	X		X	X				X	
FTK-PA: Farm to Kindergarten Initiative, The Food Trust, Philadelphia, Pennsylvania	72	X		X					X	
FTS-MA: Massachusetts Farm to School Program, Massachusetts	73							X		
LSB-CA: Los Angeles Unified Pilot Salad Bar Program, California	74			X						
MIG-MI: Mixed Greens, Michigan	75	X	X							
MSL-MT: Missoula County Farm to School Program, Montana	76						X			
OSB-WA: Olympia Unified School District Salad Bar Program, Washington	77			X			X			
RHM-CA: Riverside Harvest of the Month Program, California	78				X					
RSD-CA: Riverside Farm to School Program, California	79			X			X	X		
SFP-NY: SchoolFoodPlus, New York	80						X	X		
SMM-CA: Santa Monica Unified "Farmers' Market Salad Bar," California	81						X	X		
VEN-CA: Ventura Unified Farm to School Program, California	82			X			X			
WSD-CA: Winters Joint Unified School District Farm to School Program, California	83						X	X		

Feasibility Analysis for Farm to School Projects

Before starting program implementation, many organizations conduct a feasibility analysis to assess program viability and interest among potential partners and stakeholders. This data may be collected through surveys or interviews with the stakeholder groups, or through informal discussions and meetings. We analyzed nine feasibility studies that are included below.

Four farm to school feasibility studies focused on identifying school food service interest in purchasing from local farmers.

- The Michigan Farm to School Program conducted a statewide survey of school food service directors in 2004 to investigate their interest in and to identify opportunities and barriers for implementing a farm to school program.[4] Respondents (N = 383) reported a high degree of interest in sourcing food from local producers. Seventy-three percent reported being very interested or interested. Interest increased to 83% when respondents were asked to assume that these foods were available through current vendors. Interest was independent of free/reduced lunch participation rate or school district location (rural, suburban, urban location). Food service directors expressed diverse motivations for their interest in farm to school programs, including supporting the local economy and community; accessing fresh, higher-quality food; and potentially increasing students' fruit and vegetable consumption. The most frequently reported barriers and concerns included cost, federal and state procurement regulations, reliable supply, seasonality of fruits and vegetables, and food safety.

- A similar survey was conducted by the Oklahoma Farm to School Program in 2002.[3] It included surveys of food service personnel from other institutions such as colleges and universities, technology centers, prisons, hospitals and state resorts. Over two–thirds (68%) of the institutions agreed or strongly agreed that they would purchase local products, if price and quality were competitive. However, two-thirds (67%) of institutions were not willing to pay a higher price for local foods. The most common motivators for buying local foods were support for the local economy and community (42%), access to fresher foods (42%), and helping Oklahoma farms and businesses (41%). Common barriers or concerns cited were food safety (49%), supply reliability (46%), and lack of producers from whom to purchase (44%). The program website www.kerrcenter.com/ofpc/index.htm provides free downloads of the institutional survey and of "The Oklahoma Food Connection 2003" – a directory of agricultural producers, crops and institutional buyers.

- Under the guidance of the New York State Farm to School Coordinating Committee, the Cornell Farm to School Program[2] took the lead in conducting a survey of food service directors from K-12 public, charter, and private schools in New York State during the 2003-04 school year. The survey was intended to explore ways to strengthen connections among farmers and school cafeterias in New York State (NYS). It examined current farm to school programs and explored the potential for developing new farm to school links. Data from the

373 respondents reveal substantial involvement and an even greater potential for the use of NYS agricultural products in schools. Nearly one-quarter of the food service directors reported purchasing fresh fruits and vegetables directly from a farmer, and 72% reported purchasing NYS foods either directly from a farmer or food wholesaler. Apples, potatoes, and lettuces, all grown within New York, were cited by survey respondents as among the most frequently purchased whole fruit or vegetable products. The majority of food service directors purchased several fresh and seasonal fruits and vegetables from NY farms, and over 95% of those who had not yet purchased local food were interested in doing so in the future. Nearly 88% of food service directors felt that schools support the local economy and community by purchasing local foods. Over half felt that local purchases would benefit students by increasing their access to fresh fruits and vegetables and improving their diets. Over half also indicated that if more partially processed local products were available they would be more likely to purchase them. The most frequently cited concerns were reliability of supply, delivery, and cost. The survey found that the following tools would help food service directors to purchase local foods: lists of locally grown food product and seasonal availability, lists of farmers willing to sell to schools, health and safety information, regulatory guidelines for schools, school-tested recipes and menus, promotional materials, and an indication of food source on vendor order forms.

- Researchers from the University of California at Davis surveyed food service directors (n=38) and farmers (n=8) implementing farm to school programs.[36] The study published in 2006 identifies common characteristics among districts/communities supportive of buying local food. In addition, the study examines how food service directors perceive the benefits and barriers of buying locally and points to solutions to commonly encountered issues to buying local food in California. About half of the food service directors were motivated to buy locally to access fresher food (47%) and support the local economy (47%). Barriers cited were cost (52%), vendor and delivery considerations (47%), inconvenience of multiple invoicing (39%) and produce seasonality (34%).

An additional five studies have assessed the feasibility of multiple aspects of the program– cost of establishing a program, financial viability for food service, the supply potential for local foods, distribution options, and processing needs.

- In 2003, the San Francisco Food Systems Program conducted a feasibility analysis of implementing a farm to school program in the San Francisco Unified School District.[37] The research examined the district's assets and constraints in such areas as food service facilities, labor and training, nutrition policy, school gardens, and nutrition education, as well as mechanisms for identifying local farmers, ordering, and delivery. A School Food Environment Survey was conducted to

explore the school-specific factors that might support and/or inhibit a lasting farm to school project. Some of the difficulties identified included bureaucratic challenges, the scarcity of resources within the district, competitive food sales, lack of integration between district departments, lack of communication and connection with farming communities, and the lack of poverty level adjustments for the city and county that take into consideration the higher cost of living in San Francisco.

- A 2003 report by the Monterey County Farm to School Project provides a detailed analysis (by school district) of the needs and opportunities for procuring and distributing local produce to schools, integrating educational programs and school gardens in Monterey County, CA, and a recommended strategic plan of action for farm to school programs in the county.[38]
- The objectives for a feasibility study of the farm to school project in Montana in 2006 were to fill the need for information on 1) the quantities and types of local food purchased by public institutions and 2) the opportunities institutions may present as a market for food produced in Montana. The study also proposed to assess the state's current and potential capacity for food production, processing, and distribution needed to serve its public institutional food service markets. Results showed that although public institutions purchased a very small percentage (less than 2%) of the food consumed in Montana, successful programs at the University of Montana and Montana State University illustrated that local suppliers could provide food to public institutions.[39]
- A 2006 report from Minnesota explored the opportunities and barriers to greater use of locally-grown produce in public schools in the state.[40] Many of the food service directors interviewed had some experience purchasing directly from farmers, but typically their experience was limited to one or two products (most often local apples). However, numerous barriers to expanding use of local produce were identified. For instance, many districts are able to spend $0.15 or less for each serving of fruit and vegetables. Four key needs emerged as factors that would enable food service directors to use more locally-grown produce: 1) access to locally-grown produce through distributors; 2) risk management strategies to assure the quantity and quality of local produce, reliable delivery,

Comparative Research: Nutrition Education and Consumption of Produce

School-based nutrition programs produced a moderate increase in fruit and vegetable consumption: Meta and pooling analyses from seven studies. Howerton M.W, Bell S, Dodd K.W, Berrigan D, Stolzenberg-Solomon R, Nebeling L. J *Nutr Educ Behav*. 2007; 39:186-196

Data from seven school-based nutrition intervention studies was pooled and analyzed for changes in fruit and vegetable consumption in children. Studies included the Integrated Nutrition Project, Colorado 5 A Day Program, California's 5 A Day Power Play! Gimme 5, CATCH, 5 A Day Power Plus and the Alabama High 5 program. Results showed that at the individual level, the net difference was 0.45 (95% CI 0.33-0.59) servings; the net relative change was 19% (95%CI 0.15-0.23) servings.

and liability protection; 3) costs for local produce compatible with districts' financial realities; and 4) access to local fruits and vegetables that have been further processed.

- A regional study was conducted in four Midwestern states - Iowa, Kansas, Nebraska and Minnesota in the years 1999-2000 to determine existing purchasing practices of school food service and to identify benefits and obstacles to purchasing from local growers or producers.[41] The study found that one-third of respondents indicated that they had purchased from local growers and producers with the most common purchase being fresh produce items. Good public relations and aiding the local economy were perceived as strong benefits of purchasing locally, whereas lack of year-round availability of local product, and inability to obtain an adequate supply were cited as obstacles.

Student Impacts

Farm to school programs may influence students at various levels including knowledge and awareness about food sources, nutrition, eating behaviors and lifestyles, body weight, body mass index, and other physiological indicators of good health. The impacts of farm to school programs on students are of particular interest to school nutrition and food service staff, the public health community, as well as parents and community advocates.

Changes in student knowledge

Farm to school educational programs occur both inside and outside of the classroom on topics including nutrition and health, local foods and agriculture, and environment and ecosystems. These educational opportunities may also extend to teachers, school administration, parents, and the larger community.

Four programs have reported a change in student knowledge about the following topics.

Gardening and Agriculture

- Students participating in The Edible Schoolyard project in Berkeley, CA (ESY-CA) demonstrated greater gains in understanding of garden cycles than did students in a control group without a farm to school program. Students also demonstrated an increase in knowledge about definitions of ecosystems and sustainable agriculture.[28]
- Mixed Greens (MIG–MI) reported that participating students increased knowledge about basic gardening skills and showed a greater ability to identify plants and vegetables growing in their gardens.[10,42]

Healthy Eating

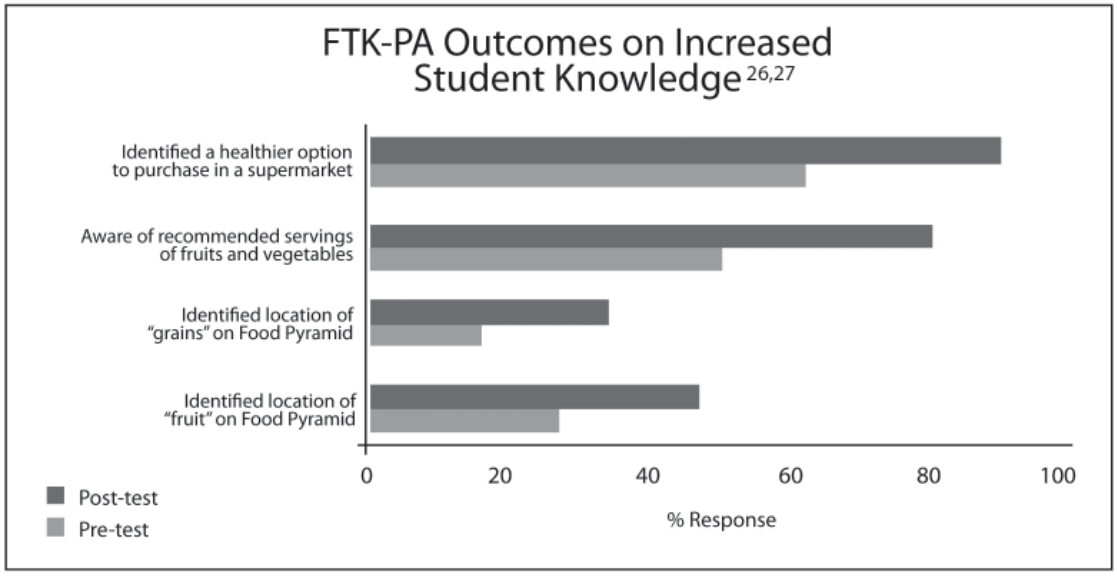
- Using a pre-post survey methodology for fifth and sixth grade students receiving an eight-week food-focused curriculum, Fresh from the Farm (FFF-IL) reported an 8.7% increase in students' awareness about the recommendation to eat more than five servings of fruits and vegetables a day. In the same program, after curriculum implementation, as many as 81% of students were able to select "carrots with veggie dip" as a healthy snack out of several options provided, in comparison to 69.5% before the curriculum was implemented. Post-curriculum, more students were aware that 100% fruit juice is the healthiest juice to drink.[43,44]
- The Farm to Kindergarten Project in Philadelphia (FTK-PA) asked kindergarten students to point out the position of various food groups on the Food Pyramid. After the nutrition education sessions, the proportion of students who could correctly identify the location of fruits increased from 27% to 47%; the propor-

Comparative Research:
Nutrition Education and Fruit & Vegetable Consumption

Getting children to eat more fruit and vegetables: A systematic review. Knai C, Pomerleau J, Lock K, and McKee M. *Preventive Medicine* 42(2006): 85-95.

This systematic review of fifteen studies assessed the impacts of nutrition education interventions to increase fruit and vegetable consumption in children. The authors reported an increase in the range of 0.3 servings to 0.99 servings/day. The studies included in this review focused on youth between the ages of 5-18 that had a control group and used fruit and vegetable consumption as the primary measurement outcome.

tion who could locate grains increased from 16% to 34%. Four out of five students receiving the farm to kindergarten program were aware of the recommended number of fruit and vegetables servings they should be eating every day; while only one of two students in the control group knew the answer. In the schools receiving farm to school programming, there was a twofold increase in the percentage of children who could identify foods they should only eat occasionally, compared to a 10% increase in correct responses from students in control schools. Ninety percent of students who had received nutrition education could identify a healthier option to buy in a supermarket as compared to only 62% in the pre-test. This program also showed an increase in knowledge about reading food labels for both foods and beverages.[26,27]



Source of Food

- Prior to curriculum implementation, about 50% of students participating in the FFF-IL program were aware that all fruits and vegetables do not grow year round. This percentage increased to 57.9% following curriculum implementation.[43,44]
- The FTK-PA evaluation reveals a statistically significant difference in knowledge about the journey of food from farm to fork among students who received nutrition education as part of the farm to school program as compared to those that did not. Correct responses for where food comes from more than doubled from

33% to 88% after children went on a farm tour as part of the farm to school program. In addition, the number of students recognizing farms as the source of food increased from 45% in the pre-test to 89% during the post-test.[26,27]

Foods Grown in the Region

- After the FFF-IL curriculum implementation, there was an increase of 10-20% in the number of students who were able to identify products grown in the region, such as corn, soybeans, carrots, peppers, apples and salad greens.[43,44]
- FTK-PA reported that when asked to point to a picture of a fruit that might be grown in the state of Pennsylvania, more than three times as many students gave the correct response after receiving the local food education.[26,27]

Changes in student attitudes

Exposing children to different types of foods can lead to changes in attitudes about these foods. Several studies have explored changes in children's attitudes about foods or their willingness to try new foods. Three studies reported that students showed a preference for new, healthy foods as a result of farm to school programming:

- A farm to school project at Abernethy Elementary School (AES-OR) reported that 44% of students interviewed preferred the farm to school pilot project lunches over lunches served during the previous year.[45]
- MIG-MI reported an increased student excitement to try new vegetables through their summer programming at Wyoming Public Schools in Grand Rapids, MI.[10] The program conducted a "veggie vote" and reported that 53% of students had tried a new vegetable over the summer when the program was operational. Students also reported an increased preference for 3 out of 5 vegetables offered (beets, peppers and salad greens).
- Almost half of the students (42%) surveyed in the BTV-VT program indicated a preference for more fruit to be served in the breakfast program, as a result of the farm to school activities in school.[14,46]
- As many as 74% of students who participated in taste tests conducted through the BTV-VT program said that the food was new to them; 43% were more willing to try new foods because of their experience with the taste tests.[14,46]
- Students from Edmunds Elementary and Middle School in the BTV-VT program demonstrated a change in perception about fast food establishments. In the pre-assessment, 59% of boys and 65% of girls were of the opinion that they could eat healthy food at a fast food restaurant, only 32% of boys and 57% of girls agreed to the statement in the post-test.[14,46]

Comparative Research: Nutrition Education and Student Dietary Behaviors

Small school-based effectiveness trials increase vegetable and fruit consumption among youth. Stables GJ, Young EM, Howerton MW, Yaroch AL, Kuester S, Solera MK, Cobb K, Nebeling L. *Journal of the American Dietetic Association*. 2005; 105(2): 252-256.

This review article covered evaluations of 5 A Day program interventions aimed at students with a control group and examined the outcome of fruit and vegetable intake. The seven projects included used a variety of nutrition education approaches including classroom lessons, farmers' market tours, media campaigns, parent activities, and lunch lessons. Different intervention and evaluation components were employed by the various projects. Four of the seven projects showed a significant change in fruit and vegetable consumption, ranging from +0.2 to +0.7 serving net change compared to the control groups. Of those four projects with significant changes, three of them are partially due to decreased consumption in the control group, along with increase or no change in the treatment groups.

Changes in student behavior

Farm to school programs are based on the premise that students will choose to eat more of healthy foods including fruits and vegetables, if the products are fresh, locally grown, picked at the peak of their flavor, and supplemented by educational activities.

Seven studies demonstrated that students participating in farm to school programs are offered more fruits and vegetables. Students subsequently choose the fresh fruits and vegetables, irrespective of whether an alternative meal option is available on that day.

Students take more fruits and vegetables from the cafeteria offerings

- In 2003-04, digital photographs of students' meal trays at the Crunch Lunch Program in Davis, CA (CLP-CA) were used to gather data about what children were consuming from the salad bar meals.[18] Data revealed that farm to school salad bars increased fruit and vegetable consumption with students taking more than the USDA minimum requirement.[i] In 2004-05, plate waste studies were undertaken to determine how much of the fruits and vegetables taken on the trays were actually consumed by the students.[19]

These studies were limited to data collection at three schools in the district that operate a comprehensive waste management and recycling program. The plate waste study results showed that, on average, 49% of fruits and vegetables served at the salad bar were consumed, compared to 66% of fruits and vegetables served through the hot lunch. However, it is important to note that on two out of three hot lunch days, apple juice accounted for approximately 50% of the total count of fruits and vegetables consumed. In addition, on salad bar days, about 85% of students took servings of fruits and vegetables, whereas at the hot lunches, only about 35% of children served themselves fruits and vegetables. The fruits and vegetables taken by students from the salad bar were 80-90% raw or unprocessed, whereas the fruits and vegetables taken from the hot lunch were 80-90% processed.

[i] USDA School Meals Initiative for Healthy Children is based on Food Based Menus. With Food Based Menus, foods from specific food groups and in specific quantities must be offered. The minimum USDA requirement in the meal component of Vegetables/Fruits for grades K-6 is two or more servings of vegetables and/or fruits, which is equivalent to 3/4 cup per child per day plus 1/2 cup extra over a week.

- Photographic comparisons of lunch trays and analysis of menu production records from the Compton Unified School District (COM-CA) in California in 2004-05 showed that students eating farm to school salad bar lunches took between 90% and 144% of recommended daily servings of fruit and vegetables while students eating hot lunches took between 40% and 60% of recommended servings. Both groups of students took close to the recommended amounts of proteins and grains.[20]
- Results from the AES-OR program show that the average servings of fruits and vegetables taken by students rose from 1.26 (pre-salad bar) to 2.26, an increase of 1 serving a day per child as a result of the farm to school salad bar program.[45]
- During 2004-06, students from Jefferson Elementary School in the Riverside Farm to School Program (RSD-CA) who chose the hot lunch meal took 1.49 servings of fruits and vegetables per meal, whereas students who chose a salad

Digital photographs of salad bar lunch trays from Davis Joint Unified School District, CA

bar lunch took an average of 2.43 servings of fruits and vegetables per meal. Thus, students who ate the salad bar received, on average, 63% more servings of fruits and vegetables than students who ate the hot lunch meal. Salad bar lunches met an average of 125% of USDA recommended daily allowances for fruits and vegetables for children.[47]

- Olympia Unified School District schools with Organic Salad Bar programs (OSB-WA) reported a 29% increase in fruits and vegetables taken by students at Lincoln Elementary and a 25% increase at Pioneer Elementary compared to schools where no salad bar was offered (2003-04 data).[48]

Comparative Research: Salad Bars and Produce Consumption

Salad bars and fruit and vegetable consumption in elementary schools: A plate waste study. Adams MA, Pelletier RL, Zive MM, Sallis JF. *Journal of the American Dietetic Association.* 2005; 105:1789-1792.

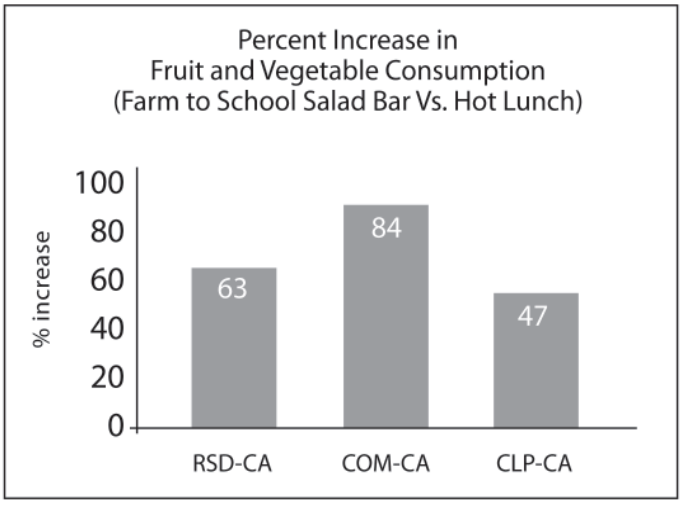
This small study examined differences in fruit and vegetable consumption between self-serve salad bars and proportioned meals. The study was conducted in two San Diego County school districts with different food offerings. Using food plate waste data from 288 students at four schools, the researchers found no significant difference in fruit and vegetable consumption between students that served themselves and those that were served proportioned items. The variety of items available did impact consumption as the lunch program with the greatest number of fruit and vegetable offerings also had the highest consumption.

Students choose farm to school meals over hot meal options

- In the Ventura Unified Healthy Schools Program (VEN-CA), students chose farm to school salad bar meals at a ratio of approximately two to one over hot meal entrees. The salad bar was more popular than all twelve hot entrees offered on salad bar days (2002-03 data).[49]
- In March 2005 when the RSD-CA farm to school salad bar program was initiated, a record 65% of students chose the salad bar lunch over hot lunch. After the initial excitement wore off, participation numbers leveled off to 26%, where they have remained since then. An unexpected result of the program has been a nearly 9% increase in overall school meal participation, including growth in the number of teacher meals served. Prior to the salad bar, the school served approximately six teacher meals per month, post-salad bar they served an average of 11 teachers per day nearly all of whom eat salad bar lunches. This growth in participation has resulted in a substantial increase in revenues that help make the program financially sustainable.
- In the COM-CA program, two farm to school sites had an average of 54.6% and 21.9% of students choosing salad bar meals over hot meals. [20]

Students self-report healthier diets by an increase in consumption of fruits and vegetables and healthy foods or a decrease in consumption of unhealthy foods

- Students participating in the Los Angeles Unified Salad Bar Project (LSB-CA) from 2000-01 reported that they ate an average of 4.09 daily servings of fruits and vegetables after a farmers' market salad bar was introduced at their school compared to 2.97 servings per day before the



salad bar started.[50] The total grams of fruit and vegetable servings consumed by students also increased significantly from 344.1 gm to 415.8 gm daily ($p = 0.07$). The researchers attributed the 84% increase in fruit and vegetable consumption almost entirely to the farm to school salad bar program. Children eating lunch at the farmers' market salad bar also reported eating reduced amounts of total calories, cholesterol, and total fat in their daily diets.

- ESY-CA students who made gains in their overall understanding of ecological principles showed a significant improvement in the numbers of servings of fruits and vegetables they reported eating.[28]
- In the FFF-IL schools, 42% of students self-reported eating 3 to 4 servings of fruits and vegetables per day before the farm to school curriculum was implemented.[43,44] This percentage increased to 53.6% during the post-test. Students also self-reported healthier eating behaviors as a result of the curriculum. (See page 36).
- Over half of the students (60%) surveyed in the BTV-VT schools reported eating fruit more often as compared to a previous year when the farm to school program was not in place.[14,46] Further, 59% reported eating new foods and 57% reported eating healthy snacks more often; many students also said that they ate less healthy foods less often, such as fast food (56% less) and desserts and sweets (31% less).

Parents report healthier eating patterns in children

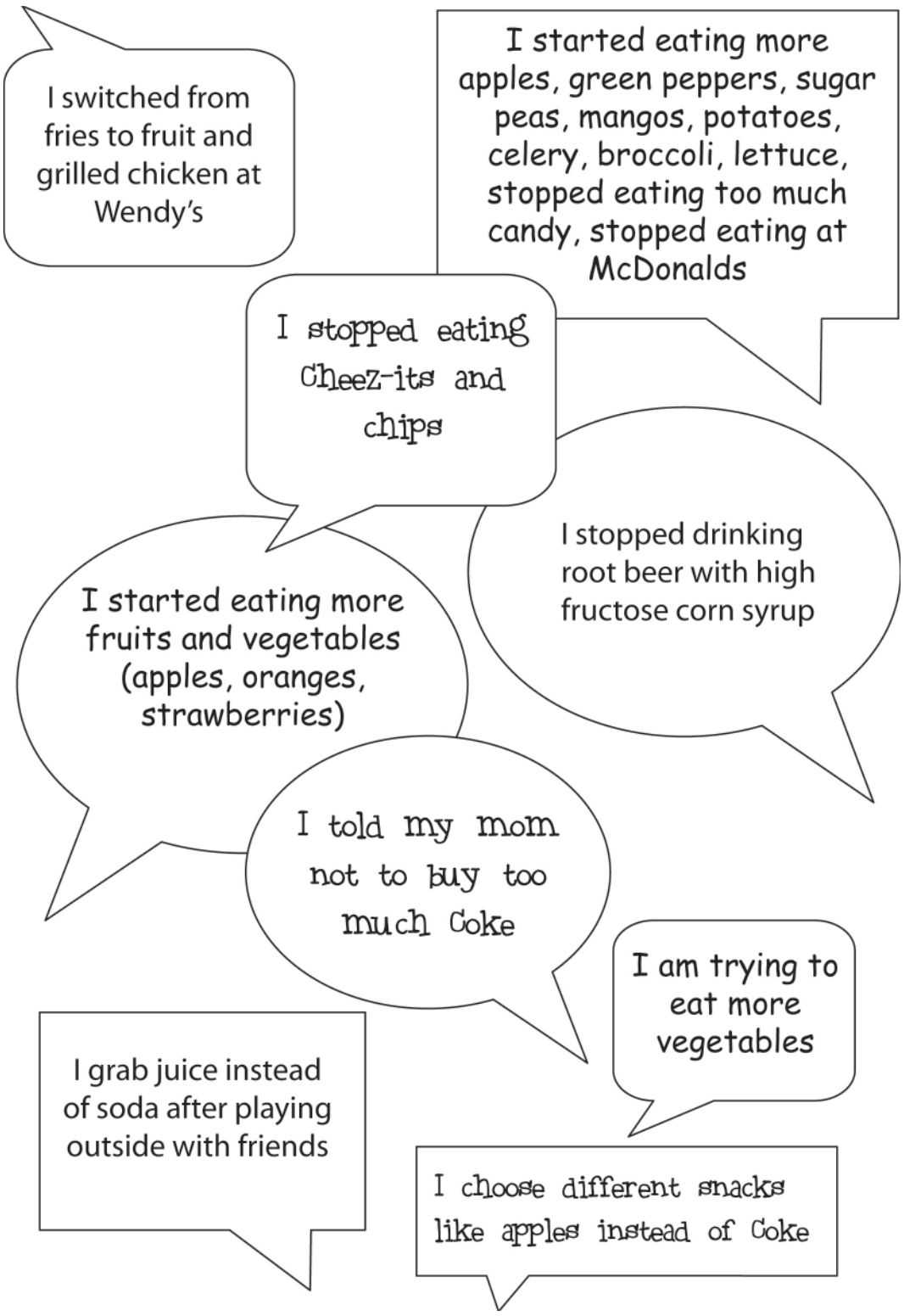
- The FTK-PA study administered a dietary survey to parents in both intervention and control schools. Results showed that children who received the farm to school intervention were opting for more healthy foods.[26,27,51] Specifically there was an increase in their mean weekly consumption of healthy foods such as whole grain bread and a decrease in consumption of foods high in fat and salt.

Comparative Research: Environmental Interventions in Schools

Environmental interventions for eating and physical activity: A randomized controlled trial in middle schools. Sallis JF, McKenzie TL, Conway TL, Elder JP, Prochaska JJ, Brown M, Zive MM, Marshall SJ, Alcaraz JE. ***American Journal of Preventive Medicine*** **2003, 24(3): 209-217.**

Researchers conducted a randomized controlled trial with aims to increase physical activity and reduce fat intake among students in San Diego middle schools. The interventions consisted of physical activity components (including increased physical activity in daily PE classes, increased physical activity outside PE class, purchase of equipment, promotions in newsletters and bulletin boards) and nutrition components (increased offerings of low-fat choices in the cafeteria, food service staff trainings on healthy food preparation, and promotional materials). Environmental and physical components of the project increased school-based physical activity among boys, but the low-fat intervention had no significant effect on fat consumption. The researchers identified financial and structural barriers to implementing the interventions, including food services' requirement to be self-supporting and small marketing efforts for low-fat foods compared to the barrage of marketing for popular snack foods.

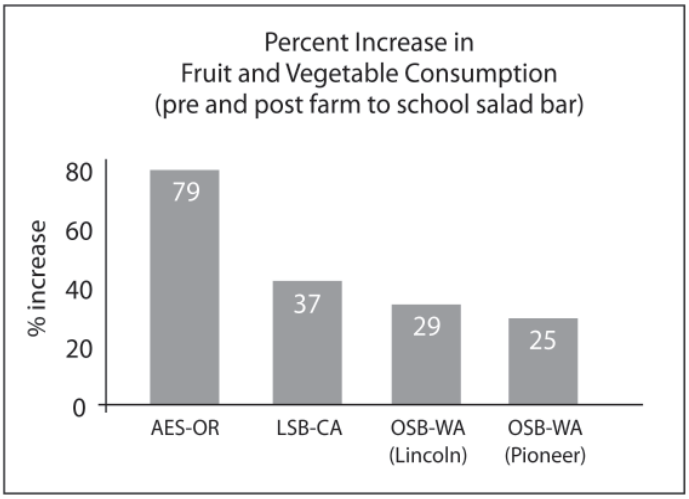
Students Report Changes in Eating Behaviors, Examples from FFF-IL Program:[43,44]



Comparative Research: Benefits of School Gardens

Use of school gardens in academic instruction. Graham H, Beall DL, Lussier M, McLaughlin P, Zidenberg-Cherr S. *Journal of Nutrition Education and Behavior*. 2005; 37:147-151.

A survey of California school principals identified reasons and perceived benefits of school gardens. Fifty-seven percent of respondents reported a garden at their school, and the gardens were "predominantly used by most schools to enhance academic instruction."



The mean weekly consumption of fruits for the experimental group was seven times a week, while for the control group it was only six times a week. There was no statistical difference in the average weekly consumption of vegetables.

Self-reports of healthier eating by students in the FFF-IL schools were corroborated by parents reporting that their children were eating more green salad at home.[43,44]

Positive behavioral changes are associated with farm to school

School-based programs that offer more nutritious foods have been associated with having positive psychosocial impacts such as improvement in academic performance, discipline and attentiveness, as well as in health indicators such as BMI and weight, and other lifestyle changes. Farm to school programs have demonstrated limited impacts on these indicators, though it has not been a focus of program evaluation thus far. Two programs have studied these impacts to some extent.

- Though the FTK-PA program did not show a difference in students' BMI over a one year period, students did report a decrease in the amount of time they spent in front of the television and other screen media. The same study reported positive changes on the DIBELS sound fluency scale (measure of phonological awareness that assesses a child's ability to recognize and produce the initial sound in an orally presented word) and the nonsense word fluency scale (a test of the alphabetic principle - including letter-sound correspondence and of the ability to blend letters into words in which letters represent their most common sounds).[26,27,51]
- Parents of students participating in the Healthy City project, a component of BTV-VT reported positive changes in their children, such as healthier eating habits, eating more fruits and vegetables, being more responsible, improved social skills and self-esteem, saving money, and improved work-ethic. Skills and knowledge gained included gardening, leadership, self-esteem, social skills, knowledge of the environment and healthy eating.[14,46]

Teacher Impacts

In addition to changes observed in students participating in a farm to school program, several positive changes have been demonstrated amongst school teachers and administrative personnel who may be participating in the program only indirectly.

- ESY-CA teachers gave a significantly higher rating to the learning environment in their school than did teachers in the control school.[28]
- The majority of teachers (78%) involved in the FFF-IL curriculum found that it was "easy" or "very easy" to integrate nutrition education concepts in their regular curriculum and none found it "too hard."[43,44]
- Ninety-two percent of teachers responding to a survey conducted for the CSA in the Classroom (CSA-CA) program in Los Angeles said that they were "very happy" with the usefulness of the produce in delivering nutrition education messages and 74% were "very happy" with the usefulness of the produce in delivering 5-A-Day messages. As many as 94% of the participating teachers indicated a willingness to participate in the program again.[52]
- All teachers (100%) who responded to a survey about the Riverside Harvest of the Month program (RHM-CA) reported that the educational and promotional materials, including the Harvest of the Month calendar, teacher meetings, monthly newsletters, farmers' market tour, farmer in the classroom sessions, and monthly taste tests were "very useful" or "fairly useful."[53] When asked if they plan to repeat any of the Harvest of the Month activities in the future, 50% of the teachers answered yes, and 25% said no because of factors not associated with the curriculum, such as their unavailability for teaching in the coming year.
- Based on a survey and focus group discussion, all teachers from Edmunds Elementary and Middle School participating in the BTV-VT program reported an increase in awareness about food, farm and nutrition issues, as well as belief that lessons on food, farms and nutrition would affect children's long-term food choices; 71% reported an improvement in their own diets as a result of the program.[14,46]

Comparative Research: Factors Affecting Nutrition and Physical Activity in Schools

Swimming upstream: Faculty and staff members from urban middle schools in low-income communities describe their experience implementing nutrition and physical activity initiatives. Bauer KW, Patel A, Propkop LA, Austin SB. *Preventing Chronic Disease* [serial online] 2006 Apr. Available from www.cdc.gov/pcd/issues/2006/apr/05_0113.htm.

This qualitative study was conducted in five urban schools to learn more about factors that enable or impede nutrition and physical activity improvements among students in low-income schools. Focus groups with approximately seven participants were held at schools where a classroom-based curriculum had been implemented. Several key themes emerged related to nutrition, physical activity opportunities, and weight-related teasing. Teachers were concerned about the contradictions between the classroom messages and the cafeteria offerings. They also expressed concern for low-income students that did not qualify for free or reduced-lunch yet weren't able to bring nutritious meals from home.

Policy Impacts

Farm to school supporters are interested in perceiving impacts of the farm to school program not just at the student level but also at the institutional level. Farm to school programs transform the school food environment by providing a forum for discussions around food and health.

The introduction of a farm to school program or organizing efforts around farm to school can lead to changes throughout the school environment such as increased teacher interest and motivation toward topics such as food, addition of gardening and environmental curricula, improvements in cafeteria environment, increased recess times and policy changes incorporating more stringent food and nutrition standards, local purchasing protocol, and healthy lifestyles for children.

- For example, the BTV-VT program demonstrated a shift in school culture around healthy food and nutrition as a result of the farm to school program. In addition to an increase in student and teacher awareness about healthy foods, farming, and nutrition issues, there was an increase in the community participation at school dinners, teachers started documenting the programs' lesson plans so that they can be used in the future, and the school board accepted the School Food Action Plan. The program was also supported by policies such as the Wellness and Nutrition Policy (Act 161) and the Farm to School Policy (Act 145)[54] enacted by the Vermont Legislature.

Of the studies reviewed for this report, none specifically focused on assessing policy outcomes, though several policies at the school district and state level have been facilitated due to successful models in operation. In this section, we present a few examples of district, county and state level policies passed that may support farm to school efforts.

Changes in school district nutrition policy

- Farm to school programs have facilitated the development of comprehensive food and nutrition policies in school districts, even before the federal mandate for schools to develop local wellness policies came into effect. These policies support farm to school efforts by including language that:
  - Mandates the preferential purchasing of local foods when possible, examples include:

    Alisal Unified School District Nutrition Policy.[55]
    Missoula County Public Schools Resolution passed May 2006.[5]
  - Supports nutrition education or school gardens, examples include:

    Santa Monica-Malibu Unified School District Nutrition and Physical Activity Policy.[57]
  - Establishes stringent standards for foods offered in schools, examples include:

    Comprehensive School Nutrition Policy for Philadelphia schools.[58]
    Seattle Public Schools Nutrition Policy.[59]

Comparative Research: Verbal Prompts for Fruit and Juice

The influence of a verbal prompt on school lunch fruit consumption: a pilot study. Schwartz MB. *International Journal of Behavioral Nutrition and Physical Activity*. 2007; 4:6 doi: 10.1186/1479-5868-4-6.

Researchers conducted a small pilot test to determine if students purchasing school lunch would be more likely to take and eat fruit or juice if a cafeteria worker gave them a verbal prompt. They found that students were more likely to take fruit and juice if they were specifically asked "Would you like fruit or juice with your lunch?" Students were more likely to actually eat the fruit they had chosen with the prompt, but they were not more likely to drink the juice that was taken after the prompt. This study suggests that verbal cues as part of the school food environment could increase fruit consumption among elementary school students, but more studies are needed.

With the local wellness policies, school districts have a unique opportunity to embrace efforts such as farm to school and use the opportunity to develop lasting policies that will ensure health and nutrition for school children in years to come. Policy changes that promote farm to school purchasing and educational programming ensure that the program is not dependent on the presence of a supportive individual to carry it through. Policy support is one way of institutionalizing the farm to school approach in school districts across the country. All five school districts listed on the previous page report that changes in the districts' nutritional policy contributed to the continued success of the farm to school programs.

Changes in city, county, state and federal policy

Information available from the National Farm to School Network on county and state policy initiatives and organizing efforts around farm to school are listed here for reference.

- Missoula County, MT encourages the purchase of local agricultural products through legislation enacted in 2005. The Missoula Greenhouse Gas and Energy Efficiency Plan and Joint Resolution 6889, state that both the city and county governments will "actively support efforts to increase the security of the local food system so that it is based on sustainable agriculture."[60]

At the state level, approximately 19 states have already passed legislation relating to the purchase of local fresh fruits and vegetables, and many more are in the works.[61] The various types of state policies that have been proposed or passed are highlighted below:

- Allocate additional funds for fruits and vegetables, using local product when available, e.g. in CA,[62] NY,[63] WA.[64]
- When price, quality and other factors are equal, local product shall be preferentially purchased, e.g. in CO,[65] KY,[66] WA.[67]
- State sets up a fresh fruit and vegetable pilot program, requiring local fresh product when possible, e.g. in CO.[68]
- A portion of funding from an established program is designated towards purchasing local fruits and vegetables, e.g. in CO.[68]

- Farm to school promotional and educational events are established, e.g. in NY,[69] CT.[70]
- A Farm to School Program is established within a state agriculture or education department, e.g. in KY,[66] OK,[30] CT,[70] IA,[71] OR.[72]
- Resolution requesting that Congress pass farm to school related legislation, e.g. in NM,[73] PA,[74] DE.[75]
- A price buffer, or preference, is allowed for local product, e.g. in MA[76], MD.[77]
- The minimum amount required for an open bid process is increased for local products, e.g. in MA.[76]
- A resolution requires that the specific state departments work together to implement farm to school programs, e.g. in NM,[73] NY.[63]
- A mini-grant program is established for farmers and schools and/or school districts, eg. in VT[78], PA.[79]
- On the federal level, Section 122 of the 2004 Child Nutrition Act authorized a farm to cafeteria program, however, funds were never appropriated. Every four or five years, there is an opportunity for all of those concerned with the health of our nation's children to evaluate, defend, and improve the federal Child Nutrition Programs. Visit www.farmtoschool.org to learn more about state, regional, and national policy priorities and efforts.

Food Service Impacts

Many farm to school programs start from and are rooted in changes to the cafeteria offerings, which may require modifications to the food service program. In order to use local product, school food service may need to employ additional workers to wash, cut, and prepare freshly harvested produce, or process other local products before they can be offered on the cafeteria line. The support of the food service director and cafeteria staff is crucial to the success of a farm to school program.

Nine of the programs studied assessed the impacts of farm to school programs on food service operations. With an improvement in cafeteria food quality and taste, these studies report an increase in overall school meal participation rates in the range of 3 -16%. More specific impacts on the food service operations are listed below:

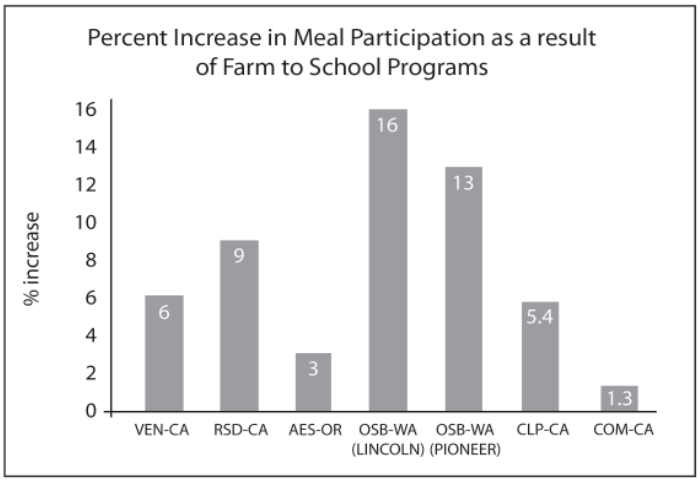
Farm to school programs offer greater variety and quantities of fruits and vegetables to students

- Trend data available from 2002-06 for the CLP-CA program shows that the farm to school salad bar offered a wider variety of fruits and vegetables than the hot lunch option.[80] In 2004-05, the salad bar offerings contributed, on average, 87% of the USDA recommended daily requirements of fruits and vegetables for children.[18] During the 2004-05 school year, students eating farm to school salad bar were offered an average of 105% of the recommended daily serving of fruits and vegetables during lunch – almost twice as much as students eating hot lunches who were served an average of 58% of the recommended servings.[19]
- Students in the Winters Unified School District Program (WSD-CA) eating the farm to school salad bar meal during the 2003-2004 and 2004-2005 school years were served between 107% and 177% of the recommended daily servings of fruits and vegetables.[18]
- The SchoolFoodPlus program in New York (SFP-NY) reported that by the end of school year 2004-05, thirty-two SchoolFoodPlus plant-based recipes had been created, tested, and served as part of the school menu cycle with varying frequency on a citywide basis. From December 2004 to June 2005, these recipes appeared on the citywide menu cycles 97 times.[81, 82]

School meal participation rates increase when schools implement farm to school programs

- The CLP-CA program recorded an increase of 7% to 11% in student participation in the lunch program at schools introducing farm to school salad bars. Overall participation in the salad bar lunches ranged from a low of 23% to a high of 41%, with an overall average of 32.4% of enrollment; in comparison to 26% participation before the salad bars were introduced.[80]

- Student lunch participation at an elementary school in the VEN-CA program rose from 50% to 56% over the first two years that a farm to school program was in place.[49] On days when staff and teachers had a choice between a farm to school salad bar lunch and a hot lunch, they chose the salad bar meal by a fourteen to one ratio.



Notes: CLP-CA, COM-CA represent salad bar and hot lunch meal participation; others represent pre and post salad bar meal participation. Timeline for collection of data – VEN-CA: 2 years; RSD-CA: 5 months; CLP-CA: avg. over 5 years; AES-OR: 1 year; OSB-WA: 1 year; CLP-CA: over 5 years; COM-CA: 1 year.

- At Jefferson Elementary School in RSD-CA, participation rates in the first five months of a farm to school program rose 4% for students receiving free lunches, 5.3% for students receiving reduced price meals, and 8.5% for paid students. Participation by adults (teachers and staff) shot up from 1.9% (just six lunches per month) to 28.8% (133 lunches per month). RSD-CA also reported a 9% increase in overall meal participation, including adult meals. From 1999-2005 (before implementation of the farm to school program) the number of meals served by the district grew at an average of about 2% per year. The school district reported a more than 25% leap in the number of meals served during the 2005-06 school year as compared to 2004-05, during which time farm to school salad bars at five elementary schools were initiated.[47]
- AES-OR reported a 3% increase in participation rates (both in full-priced and reduced-priced meals) over the previous year when the program was not operational. The control school reported no change in meal participation rates.[45]
- The OSB-WA program reported a 16% increase in school meal participation at Lincoln Elementary and a 13% increase at Pioneer Elementary (as compared to previous years); they were the first two schools that implemented the organic salad bar in 2003-04.[48]
- Overall lunch participation at Caldwell Elementary in the COM-CA program showed that salad bar participation was comparable to the hot lunch participation (averaging 51.6% and 50.3%, respectively). As a Provision II district where all students can eat breakfast and lunch free of charge, Compton had higher lunch participation than many other non-Provision II districts.[20]

- In the Santa Monica-Malibu Farmers' Market Salad Bar program (SMM-CA), the number of students choosing a salad bar lunch jumped by over 500% when fruits and vegetables from the farmers' market replaced produce from the existing supplier.[83]

Financial viability of food service operations

Farm to school programs generally serve fresh produce and other products that require additional cleaning and food preparation, potentially leading to higher labor costs. Food from local farms may also be more expensive than similar items procured from large distributors. In order to expand farm to school programs to more schools and to institutionalize farm to school meals as permanent fixtures in school cafeterias, it is critical to understand the costs associated with farm to school and to develop strategies to make these programs financially self-supporting. Farm to school programs often require a modest initial investment of money for equipment at each school site.

- VEN-CA reported initial start-up costs in the range of $3,400 to $7,000 per school site to buy equipment such as child-sized salad bars or extra refrigerator space.[49]

Cost of farm to school meals

Results from five studies show that farm to school meals typically cost more to prepare than non-farm to school meals.

- During the 2004-05 school year, the overall cost per meal for farm to school salad bar meals in the CLP-CA was $2.71/meal vs. $2.27/meal for the non-salad bar meals. With income per meal at $2.14, each salad bar meal represented a loss of $0.58/meal and each non-salad bar meal represented a loss of $0.13/meal. The overall food costs in 2004-05 were about 21% higher for the salad bar meals at $1.52/meal vs. $1.26/meal for non-salad bar meals (a $0.26 /meal difference). Labor costs were $0.80 per meal for a salad bar meal compared to $0.61 per meal for non salad bar meal, a difference of 30% or $0.19 /meal.[19]
- In COM-CA, food ingredients for farm to school salad bar meals cost an average of $0.13 more per meal than hot meals. Labor costs at two farm to school sites were $0.64 and $0.48 higher per meal than two comparative non-salad bar schools.[20]
- Per-meal preparation costs of salad bar meals in a VEN-CA elementary school were $1.19 (excluding protein-rich items) compared to $1.20 for a hot meal.[49]
- AES-OR reported that the cost of goods for the cooked-from-scratch meals at their school was lower than at other schools in the school system ($0.94 versus $0.99). However, labor costs were much higher at the pilot school, increasing the total cost per meal to $3.52 versus $1.67 for the control school. It should be noted that volunteer labor and food donations were estimated at a market value and were included in all calculations. When district level administrative costs were included, both pilot and non-pilot schools posted a deficit.[45]

- The Missoula County Public School District (MLS-MT) found, through a detailed cost analyses of 2006-07 purchases, that buying some local foods in season (apples, cantaloupe, carrot coins, carrot shredded, potatoes and salad mix) was either less expensive or no more expensive than what it would have cost to purchase comparable foods through mainstream suppliers. However, because other local foods were more expensive, the cost of purchasing local products throughout the school year amounted to an additional $1,270.96 or 11% of all produce purchases.[60]

Income generation through farm to school meals

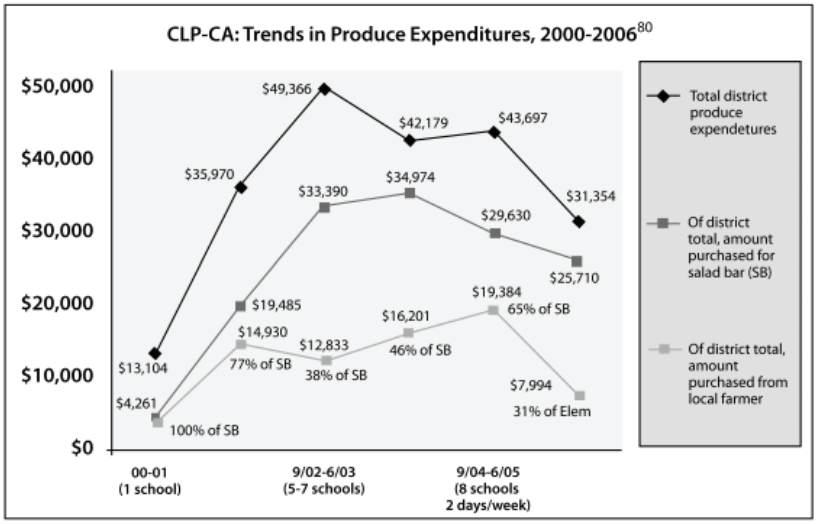
Financial viability of the locally farmed food procurement component of the farm to school program is extremely relevant to schools, since school food service operations are typically required to generate their own funds from sales and are not supported by school district general funds. Farm to school programs typically increase participation rates in school meal programs, hence a promising strategy is to use revenue from increased lunch participation to cover some or all of the labor, equipment or product costs associated with operating a farm to school project. The following four programs report an increase in school meal participation rates, with a subsequent increase in revenue for the food service operations.

- In the VEN-CA program, revenue increased 23% per student per lunch day during the first two years of the farm to school salad bar program. This equaled $11,000 in increased revenue for the school lunch program for every five hundred enrolled students over 200 lunch days.[49]
- Estimates from the RSD-CA program demonstrated that an increase in student participation of approximately 8% can cover the additional labor costs of their farm to school salad bar program.[47]
- Teachers and staff often pay more per meal than students (for example, $3.25 versus $1.90 for a full price student lunch in the VEN-CA program), so an increase in staff participation represents a significant revenue source.[49]
- The ConVal Farm to School Program in New Hampshire (CON-NH) reported an increase in food service revenue from $600,000 to $1 million in three years, attributed to increased meal participation due to the farm to school program and fees generated from their new catering operation which served local foods at sporting and other community events. The new catering endeavor was seen as a critical part of sustaining the effort to serve healthy, local foods in the cafeteria and in other venues.[84]

Changes in food procurement patterns

As a result of farm to school programs, schools change their purchasing patterns for local products and services. The following thirteen programs tracked the changes to institutional food procurement brought about due to a farm to school approach.

- At the RSD-CA program, in the peak growing seasons nearly all of the fruits and vegetables served were from local sources. In off-peak months the salad bar offerings were still about 50% local, owing to the year-round growing season in Southern California.[47]
- The VEN-CA program purchased 43% of its total produce needs from local farmers in 2003-04, up from 15% in 2002-03.[49]
- CLP-CA's spent more than $75,000 on locally grown, farm fresh produce from 2000-06. This represented more than 50% of salad bar or elementary school lunch produce on average and more than one-third of all produce procured by the district. Distributor-bought produce (from non-local sources) for the elementary schools, by comparison, amounted to about $72,000 over the same six year period (about 49% of elementary produce purchases on average). Overall expenditures for fresh, organic produce (almost $30,000 over 6 years) represented 20% of elementary produce and 14% of all district produce.[80] Overall produce purchasing trends for the school district are represented in chart below.



- The CSA-CA program paid $33,513 to Tierra Miguel, the local organic farm that grew produce for the Los Angeles Unified School District's CSA in the classroom program.[52]
- The SMM-CA program purchased produce worth $25,978 from local farmers in 1999-2000.[83]
- In 2004-05, one high school in WSD-CA purchased from three local farmers, a local farm stand, and sourced directly from an organic school garden.[19]

- COM-CA purchased about 6% of produce for its meal programs from local growers and about 94% from non-local food distributors in 2004-05. However, the local farm purchases all occurred in the last four months of the school year, thus purchases throughout the year would possibly result in a higher percentage.[20]
- CON-NH reported that the overall district purchases for local products accounted for 16% of its budget, which included fresh produce, bakery items, cheese and water.[84]
- The Appalachian Sustainable Agriculture Project's Farm to School program in select North Carolina schools (ASA-NC) reported that local products account for 3-5% of all produce purchased by school districts participating in the farm to school program from four counties.[85]
- Bend La-Pine School District in Oregon (BLP-OR) reported that its average spending on local products was $1,500 per week from four farmers, of which about $1,200 is spent on fruits and the rest on vegetables.[86]
- For the summer and fall meals served in New York City schools in 2005-06, SFP-NY facilitated the local purchases of 87,900 lbs of peaches, 40,700 lbs of nectarines and 6,600 lbs of pears through the Office of School Food distributors.[81]
- SFP-NY worked with a local manufacturer, Upstate Farms Cooperative, to develop a 4-oz non-fat yogurt with no artificial colors or flavors. The New York City Office of School Food now orders approximately 7,000 cases of locally produced yogurt at a value of $74,000 per month.[81]
- BTV-VT local purchases direct from farmers increased from $0 in 2003 to $4,636 in 2006; local purchases through distributors increased from $547 in 2003 to $2,176 in 2006, a 298% increase.[14]
- In the 2006-07 school year, MLS-MT purchased approximately 16,000 lbs of Montana grown foods, which corresponds to 24.4% of all food purchases and $11,990 in income to the local economy (up from $4,563 from previous year). Local foods purchased included oats, whole wheat flour, peaches, apples, cantaloupes, carrots, cucumbers, potatoes, zucchini, cheese, pasta, honey and salad greens, with nearly all these products being organically grown.[60]

Changes in waste management practices

- The Davis Unified School District's Waste Management Study (DWM-CA) assessed waste reduction in 2001 linked to a farm to school program. With data collected over a one year period, the study estimated gross savings of $6,320 in disposal fees from programs at two elementary schools. This estimate did not include reductions in custodial staff time and materials, nor did it include program costs, or account for the value of the educational opportunities that the program provided to students. The waste stream at Cesar Chavez Elementary

was reduced by 47%, with an estimated savings of $2,800 for the school year. At Pioneer Elementary, waste reduction was estimated at 50% for the school year, with savings of $3,430.[87]

Impacts on food service staff

Food service staff is a specific segment of the school population that is integral to the success of the farm to school effort. In general, farm to school programs are ultimately directed towards impacting school food service purchasing and serving behaviors and thereby what is served in school cafeterias, though this aspect is often not written in as an objective of the program. However, not only does a successful farm to school program facilitate changes to overall school food service operations, it often improves the knowledge, awareness and interest of school food service staff towards local foods, agriculture and healthy recipes. Anecdotal evidence is available of improved morale and job satisfaction of food service and kitchen workers participating in a farm to school program.

- Feedback from participants at food service professional development workshops conducted through BTV-VT revealed that 35% of food service professionals felt that they had increased their knowledge about local foods for school meals; 35% agreed that they had increased their knowledge of different recipes to make nutritious meals in schools; 29% reported that they would plan to interact more with teachers at their school sites; and 52% stated that using local foods in school meals was very important.[14,46]
- As a result of taste tests conducted in the BTV-VT program, food service staff have slowly started integrating new local foods in the school cafeteria menus: raw vegetables are offered in sandwiches and salad bars, prepared items served on the monthly menu include minestrone soup, cinnamon apple sauce, yogurt parfaits with granola, chicken Caesar salad and pesto pasta. Samosas and calzones are prepared off site by a local business and served on occasion during lunch.

Farmer Impacts

Farm to school programs can open up the expansive school food market to local farmers. Historically, small family farmers have found it difficult to access the cumbersome procurement systems of brokers and "middle men" who service schools and other large institutions. Data from farm to school programs suggests that schools can dedicate a significant percentage of their food budget to local foods. If the number of participating schools and larger school districts could continue to increase, farm to school procurement could come to represent a sizable and stable market for small, local farmers. Data on this aspect of farm to school impacts has been limited, though participating farmers typically report that farm to school programs contribute approximately 5-10% of their income. Of the studies compiled for this report, nine described the impacts on farmers.

- As of May 2006, the two farmers participating in the RSD-CA program averaged more than $1,700 per month in produce sales to the district. Furthermore, both farmers have become very involved with the district: hosting field trips for students to visit their farms, speaking at 'farmer in the classroom' presentations, and participating in a Riverside Farm to School Workshop. This farm to school program has thus extended the farmers' relationships into the classroom.[47]
- CLP-CA purchases from local farmers ranged from $16,201 in 2003-04 (46% of total salad bar purchases), to $22,805 in 2004-05 (65% of total salad bar purchases), and dropping down to $8,000 in 2005-06, when the district started serving pre-packaged salads instead of a salad bar.[80] Over the years the district has purchased from up to nine individual local growers and a Northern California distributor who buys from a group of 18 local producers. The percentage of farmer income from the school district account probably decreased over the six years. For most growers, the school account represented less than 5% of total income. In 2005-06, this may have been even lower than 2%, with the exception of a kiwi farmer who reported district sales representing about 40% of his direct sales income in 2004-05.
- All farmers in the BTV-VT program stated that they enjoyed having the opportunity to educate students about their farms, and that the school field trips provided them with some direct marketing opportunities.[14]
- Between June 2005 and May 2006, produce farmers selling to schools in the Massachusetts Farm to School Program (FTS-MA) grossed more than $55,000 in K-12 sales.[88]
- A 2002 study of six farmers supplying to farm to school projects in different regions of California reported that overall, farmers were dedicated to the idea of the farm to school approach and were passionate about the philosophical underpinnings of the program. However, profits and quantities were too small to contribute to an overall profit margin. Nevertheless, farmers held the pro-

gram in high esteem and wanted to nurture it for its potential benefits. Because the program's values were in line with their own values, these farmers were committed to making the program work. And even though the farm to school marketing was not yet contributing much to their business profits, it appears to be contributing indirectly through the synergy it creates among farmers, school personnel, parents, children and other community members.[89]

- The CSA-CA program generated $33,513 in revenues for the participating farm during the 2002-03 pilot year. This amount was modest, though not insignificant for the farm, and helped established connections for future programming at schools.[52]
- As a result of SFP-NY efforts, Champlain Valley secured a $4.2 million, three-year contract to provide New York-grown, processed and packed apple slices to New York City schools.[81]
- In an effort to replace Department of Defense-supplied baby carrots in schools with locally grown and processed products, SFP-NY supported local farmers in testing the New York State grown Sugar Snack variety and are working towards growing, processing and packing these in the state of New York.[81]
- The number of farms from which BTV-VT purchased product increased from three in 2005 to five in 2006. The successful integration of foods from local farms in the school cafeterias is attributed to relationship development between farmers and the Burlington school district, ability to use high school cafeterias to lightly process raw foods, and availability and willingness of the school administration to incorporate local foods. The Burlington school district contracted with and paid farmers up front for produce and the farmers planted vegetables specifically designated for the schools.[14]

Parent Impacts

Farm to school programs offer parents whose children participate in the program some educational activities such as healthy eating seminars, farm tours and trips to the farmers' market. If parents receive the same information children do through the farm to school program, changes in the family lifestyle and eating habits are more likely to happen. Parents who are strong supporters of farm to school programs also volunteer their time in planning and implementing the program.

Only three programs had a parent education component included in the program and reported on its impacts.

- FTK-PA indicated that 78% of parents reported an increased awareness for having their children eat more fruits and vegetables.[26,27,51] A majority of parents (90%) felt that they had changed the way they shopped for groceries, prepared meals and talked to their children about food. After one year of participation in the FTK-PA, 97% of parents believed that buying locally grown food is "important" or "somewhat important."
- FFF-IL parents indicated a slight increase in their ease and interest in encouraging their children to eat healthy snacks and meals.[43] FFF-IL parents listed a variety of changes they hoped to make in their families' diets as a result of a Parent Nutrition Education Event organized by the farm to school program. The proposed changes included attempts to cook healthier foods at home, serving more fruits and vegetables at home, reducing the use of sugar, reading ingredient labels more carefully before purchasing food products, and becoming good role models for the children.[43,44]
- Parents of school children in the BTV-VT program helped with taste tests and special event dinners, worked in classrooms and gardens, attended Food Policy Council meetings and advocated for the project at the Parent Teacher Association meetings. All the program staff remarked about the importance of parent and community volunteers in the success of the project. Parent feedback on family changes as a result of the BTV-VT program revealed that 32% believed that their family diet had improved since their child's participation in the program; 32% reported buying more local foods; 45% were willing to pay more for the school's hot lunch if it contained food from local farms; and 90% believed that lessons on food, farms and nutrition would affect children's long-term food choices.[14,46]

Community Impacts

One program studied for this report (BTV-VT) addressed the broader impacts of a farm to school program on the food environment in neighborhoods, surrounding school sites, or local food systems and distribution channels.

- BTV-VT conducted the 2006 Vermonter Poll, a statewide public opinion survey of Vermonters.[14] Results showed that the impacts of the Food, Farm and Nutrition Education (FFN) such as the local farm to school program are reaching Vermont at large. As many as 71% of parents with school age children reported that their children had participated in the FFN program, 40% indicated that children had shared FFN information with their family, 38% reported that children were willing to try new foods, and 26% reported that their children eat more fruits and vegetables. Parents were willing to pay an average of $1.63 more for school lunches if the cafeteria served fresh, local food. Overall, 38% were willing to pay between 10 cents and a dollar more for fresh local foods in the school cafeterias.
- Results from the evaluation of the Burlington Legacy Project's Annual Town Hall Meeting showed that 86% of the community was aware that there was an increase in distribution of more fresh and local foods in Burlington schools. In addition, 70% were aware that food taste testing was being conducted in some schools, and 97% of community members expressed interest in the school district purchasing more food from local farms.