Impact of Farm-to-School Programs
A Research Brief to the Massachusetts Food Policy Council

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Executive Summary
Definitions of FTS programs are varied and nuanced, differing by US region and across state counties and school districts. States and school districts interested in starting their own program, or those looking to scale-up existing efforts, need only look online for a plethora of reports and databases. The National FTS Network and USDA provide information discussing implementation and evaluation challenges, successes, and solutions. A review of available data gathered from a range of sources - including students, teachers and staff, administrators, food service directors, and farmers - reveals positive anecdotal evidence to support FTS programs. Research-based evidence, however, is sparse. Methods for evaluation vary across programs, and few have formal data collection protocols. At present, anecdotal evidence and unpublished reports are widely used to inform state and local policy. Looking ahead at FTS in Massachusetts, it will be important to weigh the validity of available data, identify existing support systems for FTS programs in the Commonwealth, and develop a systematic method of evaluation to inform future decision making.

Rationale behind FTS programs
There is growing momentum to implement comprehensive, community-based interventions to curb and prevent childhood overweight and obesity which can lead to serious, chronic health problems. Nearly one in three children and adolescents in the United States is overweight or obese.\(^1\,^2\,^3\,^4\) Schools, and in particular school cafeterias, have been identified as reasonable settings to effectively impact children’s nutrition.\(^1\) More than 31 million children are served school lunches each day, at a cost of over $10 billion,\(^5\) and food consumed at school fulfills approximately 35% of children’s daily food requirements.\(^1\)

Research shows that children consume more fruits and vegetables when fresh produce is made available and accessible.\(^1\,^6\,^7\,^8\) Schools offering a wide variety of produce have seen increases in children’s fruit and vegetable intake and changes in their food choices and preferences.\(^9\,^10\) In a recent study, the introduction of a salad bar to a school’s lunch program was linked with a significant increase in the frequency of fruit and vegetable intake. The same study also found that after adding a salad bar, children’s cholesterol, saturated fat and total fat intakes were reduced.\(^6\) Studies such as these justify the establishment of FTS programs.

FTS has risen in popularity over the past decade. Today, well over 8,000 schools across the country participate in FTS\(^11\) and it is estimated that about 16% of school districts in the U.S. have guidelines for buying locally grown produce.\(^12\) The rationale behind creating FTS programs pivots on two community focal points: students and farmers. Support for FTS is often framed in terms of decreasing the prevalence of childhood overweight and obesity.\(^2\,^13\,^14\) There has also been a shift in the way people think about their food, moving away from globalized agribusiness centered on commodity farming, to small- and mid-scale farms within a sustainable community agriculture system.\(^14\) With high distribution costs and the disappearance of land, farmers are in need of new, accessible markets for their products.\(^2\,^9\,^15\) FTS programs have also been pointed to as a strategy for bolstering community food security.\(^15\,^16\) Thus, FTS programs can benefit multiple stakeholders.

Features of FTS
While definitions of FTS programs are varied and nuanced, one consistent feature of FTS programs is the provision local, nutritionally-valuable foods in school cafeterias or classrooms.\(^9\,^13\) Generally agreed-upon objectives of FTS include:

- improving student nutrition;
- providing health and nutrition education opportunities;\(^17\,^18\)
- supporting small and medium-sized local and regional farmers.\(^2\,^9\,^17\)
While there is some level of agreement on the overall scope and objectives of FTS, there is tremendous variability in local implementation of programs. For example, while most FTS programs incorporate nutrition education, marked differences are observed in its frequency and duration. Some programs hold only a few events per school year, or a week-long promotion, while other programs revise their curriculum to bring in cooking demonstrations, taste-testing, field trips to farms, and other interactive activities through the school year.

Without a consistent, unified definition of FTS and the associated intervention components, it is difficult to generalize program effects. Adding to this, program evaluations of FTS programs do not separate the various components, and often do not clearly identify program elements, and so are unable to measure the impact, if any, of a given activity. This makes any conclusions drawn about FTS murky at best.

The role of policy
Success in the dissemination and implementation of FTS programs is heavily shaped by state and federal legislation. The recent Healthy Hunger Free Kids Act (2010) mandates the provision of $40 million in funding to help schools establish gardens and source local foods for their meals. As part of that act, the USDA will assist eligible schools through grants (of up to $100,000) and technical assistance to implement FTS programs that improve access to local foods. In particular, the USDA will support high priority FTS programs (e.g., those in underserved areas) with “adequate and participatory” evaluation plans. Recipients of such grants must collect and share information on best practices and disseminate research and data on existing FTS programs.

Are FTS programs effective?
For the purposes of this report, we limited our review of available literature to impact evaluations and assessments specifically concerning FTS programs. The available information falls into two categories including (1) anecdotal accounts and unpublished reports and (2) published reports subjected to peer review. The most commonly cited benefit of FTS programs is an increase in fruit and vegetable consumption in children. FTS programs are also widely touted as promising a range of economic, health and academic benefits including:

- Support for local farmers (increasing their profits), the community, and the economy;
- Higher quality food in schools;
- Increased fruit and vegetable intake in students;
- Improved diets;
- Increases in student knowledge about nutrition;
- Increased participation in school meal programs;
- Improved school public relations.

The evidence available however must be considered separately for anecdotal/unpublished versus peer-reviewed published reports.

Anecdotal accounts and unpublished reports
In 2011, the USDA FTS team visited 15 school districts across the country to evaluate their FTS programs and summarize the findings. As noted in their report, FTS programs have the potential to impact many segments of the community, improve student dietary habits and nutrition knowledge, and create positive effects in the local economy. Yet most programs outlined had little or no method for evaluating program effectiveness. As a result, the conclusions drawn by each program were largely anecdotal. Two school districts, however, had a formal process to evaluate...
changes in student food preference, knowledge of agriculture and dietary habits. Their assessments found increases in 2nd and 3rd graders’ consumption of and preference for fruits and vegetables, and an increase in their knowledge of where food comes from.  

In a second unpublished report, researchers at UNC reported on FTS activities and outcomes in school districts in Oregon and California. Increases in student fruit and vegetable consumption and student knowledge about foods grown in-state and agricultural processes were noted. 

Overall, we found unpublished reports to be the most abundant source of information on FTS. While such reports offer insight into the mechanics of programs and their potential outcomes, they fall short in providing reliable evidence that FTS programs are associated with positive health outcomes. Key shortcomings of such reports include:

- Little or no methods for evaluating effectiveness;
- The use of unvalidated evaluation tools;
- Inconsistent data collection methods which make it difficult to generalize results; 

The failure to evaluate FTS programs has been linked with challenges cited by school districts including: a lack of baseline data; a lack of knowledge about where to find evaluation resources; and a lack of time and funding to conduct evaluations. Such challenges are important considerations as the MA Food Policy Council makes recommendations around FTS programs in the state. School districts clearly need support with evaluation. One piece of literature identified in our review that may be useful to schools is a report by the National FTS Network outlining 25 different assessment tools.

Peer-reviewed published reports

Of the 38 articles reviewed for this report, only four were peer-reviewed, and of those four only two reported evaluation results of a FTS program.

One pertinent example is a FTS program in Cambridge, MA. FTS activities in this study included nutrition education, school gardens, new recipes for school lunches that emphasized fresh, local ingredients, and the establishment of a food purchasing system with a local farmer. Results from the three year study showed a significant increase in the prevalence of ‘healthy weight’ in children and a significant decrease in the prevalence of obesity. While such results are promising, it is worth noting that FTS was one of a number of intervention activities in this case. Additional activities included a BMI fitness card, physical education enhancements, community awareness campaigns, and family outreach. As such, FTS was part of a larger synergistic effort.

Additional benefits of FTS programs that have been noted in published reviews include increases in student participation in school lunch programs, increases in student knowledge of growing cycles and seasons, food systems, and healthy foods, and increases in gardening skills. 

Cost considerations

It is important to consider costs associated with FTS as this may form a fundamental barrier to its implementation. A 2010 study found that purchasing locally grown food was on par with, if not cheaper than, food bought from large distributors. It is worth noting, however, that the programs cited were equipped to prepare unprocessed foods. Other school districts have noted cost as a barrier to implementation, specifically the cost of processing food on-site (labor and equipment), purchasing local foods, and training personnel. In a USDA survey of school districts, most did not formally track the percentage of their total food purchasing that went towards local products, though it was estimated to be anywhere from 1-35%. It was indicated that local foods were
typically cheaper in-season, and that other benefits (e.g., taste, student consumption) outweighed costs incurred. In summary, while there is some evidence that the benefits of FTS outweigh the costs incurred, cost implications of FTS vary based on a school’s capacity for on-site food preparation.

**FTS program strategies used in states with similar growing seasons**

Much of the available information on FTS programs comes out of California, which not only has a very long growing season, but has great variability in the types of products grown. Massachusetts has a relatively short growing season, lasting from late April to late October (from last frost of the year to the first). States with similar growing seasons and climates and with documented FTS programs include Michigan, Minnesota, Pennsylvania, and other New England states like Connecticut, Rhode Island, Vermont and New York. Case studies from Vermont and Pennsylvania outlined below can provide guidance on feasible FTS activities in MA.

### Table 1. Farm to school activities, by program site

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<th>Farm to school program activities</th>
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<th>Kindergarten Initiative</th>
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**Vermont: VT FEED**

In 2009, the CDC-funded an evaluation of FTS programs in 12 Vermont schools. FTS activities are across the schools are summarized in Table 1. Key findings from the evaluation include the following:

- Food service directors reported increased participation in the school lunch program as a result of FTS.
- Schools with FTS programs had nearly twice the national average consumption of fruit and vegetables.
- Students had more positive attitudes towards eating fruits and vegetables when:
  - schools had the capacity to prepare unprocessed foods on site and involve the students in food preparation
  - they have met a farmer (oftentimes through a school field trip)
- No one component of FTS could be pointed to as more effective than another to change student attitudes towards fruits and vegetables

**Pennsylvania: Kindergarten Food Trust Initiative**

Goals of this program were two-fold including:

1. Increase student consumption of nutritious food; and
2. Increase student and parent awareness of locally grown food.

An evaluation using pre- and post-tests assessed nutrition and food system knowledge, BMI, parent-reported child dietary intake, and teacher training. Results indicated that, in comparison to a control group, students in FTS programs:
• were more likely to know the recommended number of daily servings of fruits and vegetables;
• were better able to identify high sugar foods by reading the labels;
• consumed fruits and nuts more frequently;
• showed improved knowledge about the source of their food.  

No significant differences between experimental and control groups were observed in students’:
• ability to read and understand food labels;
• consumption of nutritious foods (other than fruits and nuts);
• body mass index;
• screen time.

**FTS legislation in other states to consider**
In addition to reviewing specific FTS programs in states with similar growing seasons, we reviewed supporting legislation in each state. Common provisions in legislation across states include:
• establishing a state FTS program;
• formalizing program activities and procedures;
• providing outreach, training and technical assistance to FTS programs;
• naming state agencies to head up FTS efforts (typically the Departments of Education, Public Health, and Health & Human Services); and
• providing financial incentives (e.g. a grant programs).

**Conclusions**
Advocates agree that FTS programs create valuable, sustainable connections between farmers, school staff, students and community members, support healthy nutrition, boost the local economy and offer profitable markets to farmers. There is little reliable evidence, however, to support the effectiveness of FTS in fostering healthy eating behaviors and attitudes in children. While some benefits for children and schools have been noted, the majority of evidence to date is based on anecdotal accounts or unpublished reports. In one of the few published peer-reviewed studies identified, declines in the prevalence of obesity were observed. In this instance, however, FTS was one of a number of intervention activities. Multiple reports conclude that bringing local foods to a school meal program alone is not enough to create lasting behavior change. FTS needs to be part of a larger system of policies and activities supporting healthy food choices in children. Additional pertinent points garnered from our review include the need to establish systematic and automated methods of evaluation, the need to provide schools with technical and evaluation-related assistance, and the need to consider the capacity of schools to prepare foods onsite.
References


28. Center for Health Promotion and Disease Prevention. University of North Carolina at Chapel Hill. Farm to school program evaluation (Riverside, CA; Springfield, OR; Saratoga Springs, NY; Union 74, ME). Available at: http://www.farmtoschool.org/files/publications_376.pdf


Appendix

Legislative History Related to Farm to School

1946: National School Lunch Act
On June 4, 1946, President Harry S. Truman signed the National School Lunch Act (NSLA), which permanently authorized the National School Lunch Program. The legislation was passed in response to concerns that “many American men had been rejected for World War II military service because of diet-related health problems.” Its purpose was to provide a market for agricultural production and to improve the health and well-being of the nation’s youth.

1966: Child Nutrition Act
On October 11, 1966, President Lyndon B. Johnson signed the Child Nutrition Act (CNA), which added a new dimension to school food services. In its Declaration of Purpose in Section 2 of the Act, the Congress stated, "In recognition of the demonstrated relationship between food and good nutrition and the capacity of children to develop and learn, based on the years of cumulative successful experience under the NSLP with its significant contributions in the field of applied nutrition research, it is hereby declared to be the policy of Congress that these efforts shall be extended, expanded, and strengthened under the authority of the Secretary of Agriculture as a measure to safeguard the health and well-being of the Nation’s children, and to encourage the domestic consumption of agricultural and other foods, by assisting States, through grants-in-aid and other means, to meet more effectively the nutritional needs of our children.” CNA expanded the NSLP, established the School Breakfast Program (SBP), extended the Special Milk Program (SMP), and provided Federal funding assistance towards non-food purchases for school equipment.

2002: Farm Security & Rural Investment Act
The Farm Security and Rural Investment Act of 2002, known as the 2002 Farm Bill, authorized the Fresh Fruit and Vegetable Pilot in four states and one Indian Tribal Organization (Zuni, New Mexico). The purpose of the pilot was to determine the best practices for increasing fruit—both fresh and dried—and fresh vegetable consumption in schools. The Pilot is now known as the Fresh Fruit and Vegetable Program.

2004: Child Nutrition and WIC Reauthorization Act
The Child Nutrition and WIC Reauthorization Act of 2004 amended the NSLA to encourage improved access to local foods in schools “through farm-to-cafeteria activities, including school gardens, that may include the acquisition of food and appropriate equipment and the provision of training and education.” The Act required every school district participating in the NSLP and/or SBP to establish a local wellness policy by the start of the 2006-2007 school year. Additionally, it required schools to set goals for nutritional standards of foods available in schools, nutrition education, physical activity, and other school-based activities designed to promote student wellness. The legislation requires that a broad group of local stakeholders be involved in designing the policy to ensure that the diverse needs of the community are met, including members of the school board, school administrators, representatives of the school food authority, parents, students, and members of the public.

2006: Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act
This act appropriated a one-time funding of $6,000,000 to further expand the FFVP to include: Utah, Wisconsin, New Mexico, Texas, Connecticut, and Idaho. Currently, the FFVP is nation-wide in selected schools in 50 states, the District of Columbia, Guam, Puerto Rico and the Virgin Islands.
2008: Consolidated Appropriations Act
This Act expanded FFVP nationwide in selected schools in all 50 states, the District of Columbia, Guam, Puerto Rico and the Virgin Islands. It also provided approximately $9.9 million to begin program operations for School Year 2008-2009.

2008: Food, Conservation, and Energy Act
The Food, Conservation, and Energy Act of 2008, known as the 2008 Farm Bill, amended the NSLA to allow institutions receiving funds through the Child Nutrition Programs to apply a geographic preference when procuring unprocessed locally grown or locally raised agricultural products. This applies to operators of all of the Child Nutrition Programs, including the NSLP, SBP, FFVP, SMP, Child and Adult Care Food Program (CACFP), and Summer Food Service Program (SFSP), as well as to purchases of fresh produce for these programs by the Department of Defense (DoD). In addition to this, the Farm Bill also: Retains the minimum of $50 million annually for purchase of fresh fruits and vegetables for use in schools and service institutions participating in programs under NSLA, and allows that these amounts may continue to be spent through DoD Fresh Program; clarifies that nutrition education under an NSLA "farm to cafeteria" pilot program should promote healthy food education; gives priority to projects that can be replicated in other schools; and authorizes hands-on gardening pilot programs at “high-poverty” schools in up to five States.

2009: Agriculture Appropriations Act for FY 2010
The Agriculture Appropriations Act—which provides funding for most of USDA’s programs—has many positive impacts. The Act increased investment in rural communities to create wealth, utilizing resources to help focus USDA initiatives on renewable energy, broadband infrastructure, and local and regional food systems; increased access to safe and nutritious food by providing funds necessary to meet the demand for USDA’s nutrition assistance programs to promote healthier diets; and provided funding for a school community garden pilot program authorized under Section 18(g)(3) of the NSLA.