



Previous Page: 3rd grade students from Gouge Elementary plant strawberries at Green Toe Ground farm in Celo, NC.
Photo by Emily Jackson.

Above: A student enjoys the farm to school salad bar at Emerson Elementary School in Riverside, CA.
Photo by Riverside USD.

II. Resources and Tools for Measuring Farm to School Impact

Once evaluation questions and indicators have been decided, the next step in evaluation planning is to choose the best method to measure the selected indicator(s). A wide variety of data collection methods are available, and decisions about which method to select will depend not only on the outcomes to be measured, but also on the credibility of the collected data for the target audience. Assessment tools can be developed from scratch, or tools already developed for other projects can be used in their entirety or modified to suit specific needs. Using tools developed by other projects not only saves time, it may also ensure rigor of the method if the tool has been validated. In some cases, data gathered from other projects that have used the same tool may be used as a control or reference data for comparison. Online survey services, which also provide data analysis services, are increasingly being used in program evaluations, though their use is limited to populations with internet access and basic computer skills. In the case of farm to school evaluations, this may include food service directors, school administrators, parents, community members, farmers and older students.

A compilation of common tools that have been used by existing farm to school program evaluations is included in this section for reference. Before a tool can be considered for use, project planners are advised to consider how the tools relate to the evaluation goals as well as the rigor of the tools and methods. Where possible, samples have been provided in the Appendices. Unless clearly indicated for wider use and distribution, it is advisable to contact the authors or organizations for permission to use the tool in part or in its entirety.

Common Tools and Methods for Use in Farm to School Evaluations

Baseline / Existing Program Information / Feasibility Studies

Collecting information about existing programs to establish baseline data is inherently valuable. This information can be in the form of pre-intervention indicators, which are then compared with data for the same indicators collected after the program has been operational. Data about the scope and coverage of existing programs can be collected to serve as a benchmark of farm to school development. State or regional agencies will find this data useful since it provides a mechanism for tracking the region's farm to school programs over a period of time. Feasibility analyses can lay the foundation for a farm to school program by assessing demand and interest levels.

Examples of tools used in collecting baseline / existing program information / feasibility studies (see appendices p 85-127):

- › Farm to School in New York State Survey of K-12 School Food Service Providers²
- › Survey of Institutional Food Service Providers in Oklahoma³
- › Survey of K-12 Food Service Providers in Michigan⁴
- › National Farm to School Web Survey
- › Northeast K-12 Food Service Directors Needs' Assessment Tool⁵
- › New Mexico Survey of Fruit, Vegetable and Nut Producers⁶
- › New Mexico Survey of School Food Service Providers⁶

Student Impacts

a) Assessing changes in knowledge, attitudes, and beliefs

Farm to school programs are premised on the assumption that if students are provided knowledge about healthy, locally grown foods, in addition to having access to them, then it is more likely that they will have positive attitudes towards such foods, and potentially develop lasting eating habits at an early age. Documenting this first step in knowledge and attitude development is important to ascertain whether the program has potential to impact behavior.

Various surveys have been used to assess knowledge about local foods, nutrition and health, gardening, etc. However, since each program has a specific focus, ready-to-use surveys that exactly meet the needs of a particular program may not be available. Sample tools in the Appendices provide some ideas.

Examples of tools used in assessing student knowledge, attitudes and beliefs (see appendices p 128-153):

- › Hawthorne Unified School District Student Knowledge Survey⁷
 - › Outcome Expectations for Eating Fruits and Vegetables - 5 A Day Power Play Survey⁸
 - › General Knowledge Survey⁹
 - › Mixed Greens Michigan Veggie Vote¹⁰
 - › Rethinking School Lunch Student Dining Evaluation Form¹¹
 - › Seven Generations Ahead Student Survey⁹⁰
 - › Harvest of the Month Survey¹²
 - › Food Preference Survey¹³
 - › Burlington Schools Student Survey¹⁴
 - › Student Interview Protocol - University of California Sustainable Agriculture Research and Education Program (UC SAREP)
 - › Self-Efficacy Survey: Eating Fruits and Vegetables⁹¹
 - › Self-Efficacy Survey: Eating, Asking, Preparing Fruits and Vegetables⁹²
- ▶ Food preference surveys to assess whether target populations show a change in recognition and palatability for fruits and vegetables.
 - ▶ Student surveys to assess impacts of nutrition education using seasonal fruits and vegetables.
 - ▶ Student surveys to assess recognition of foods grown in the region or edible parts of plants.
 - ▶ Assessing whether participation in a school garden affects student knowledge and attitudes about fruits and vegetables.
 - ▶ Classroom-based activities have also been used to gauge changes in knowledge, attitudes and preferences. These methods are not as rigorous as others described above, though they may be useful in getting informal feedback from students.
 - ▶ Students keep journals to chronicle what they have learned from farm to school activities.
- ▶ Using a series of cards depicting stages in the food system, students can order the cards to show how food goes from the farm field to the dining table.

b) Dietary behavior

Widespread research demonstrates that students do not consume the required daily amounts of healthy foods such as fruits and vegetables. The ultimate goal of any nutrition education activity is to impact current or future dietary behaviors. Cafeteria interventions that actually alter the foods available to students need to be evaluated to document possible changes in student consumption. Several methods have been used in nutrition research to measure dietary intake. The most rigorous methods involve invasive biomarker methods and aren't often appropriate for farm to school evaluations given the financial and professional resources required. Listed below are methods to measure or approximate dietary intake that have been used or have a strong potential to be used in farm to school evaluations.

- ▶ Food records whereby participants keep records of their dietary intake, generally over a three to seven day period, can provide dietary information.

- ▶ Food frequency questionnaires gather dietary data through the completion of a questionnaire that covers foods eaten over a span of time, often many months. The questionnaire must be culturally specific so as to capture foods eaten in the participant's diet.
- ▶ 24 hour dietary recall is a method whereby an interviewer asks a participant to remember all food items and quantities consumed within a 24-hour period.
- ▶ Screeners are usually shorter survey instruments that focus on certain type(s) of foods in the diet, such as fruits and vegetables, or fiber.

Examples of tools used in assessing student dietary behavior (see appendices p 154-162):

- › Diet History Questionnaire - National Institutes of Health²¹
- › 24 Hour Dietary Recall²²
- › Estimation of Fruit and Vegetable Consumption by Students Based on Analysis of School Food Service Production Records²⁰
- › Food Recognition Form²³
- › Nutritionquest Kid's Questionnaire²⁴
- › Youth Risk Behavior Survey Fruit and Vegetable Consumption Survey²⁵

These methods have been widely used in nutrition and nutritional epidemiology research and validation studies have been conducted for many versions of these methods. In the farm to school program evaluations reviewed for this report, other approaches have been used as a proxy for measuring dietary intake, for example:

- ▶ Digital photographs of school meals have been taken and analyzed to assess what students serve themselves in cafeteria food lines.¹⁵⁻²⁰ If used along with food waste data in the cafeteria, these photographs can reveal information on an average amount of food students consume through the school meal program.
- ▶ Analyses of food production records from the school cafeteria are an indirect method used to estimate how many servings of a particular product (typically fruits and vegetables) every meal produced in the school cafeteria contains. This method assumes that the amount of product offered on each tray is the amount consumed by the students.
- ▶ Analysis of meal choices made by students, such as trend data for number of students choosing a farm to school salad bar meal versus a hot meal option combined with nutrition information per meal served can provide information on average student dietary intake from the school meal.

c) Measures of weight and health

Assessing body mass index (BMI) – BMI is a ratio of weight in kilograms divided by height in meters squared (wt/ht²) to measure body fat. BMI measurements are based on height and weight and require trained staff to perform measurements. Some school

districts and states have required that students' weight and height be measured regularly to track BMI as part of student health records. This information may be available for evaluation purposes from the school district or state.

d) Impacts on literacy

The DIBELS (Dynamic Indicators of Basic Early Literacy Skills) are a set of standardized, individually administered measures of early literacy development. They are designed to be short (one minute) fluency measures used to regularly monitor the development of pre-reading and early reading skills. DIBELS can be used for students in Grades K-6, and have been used by one farm to school program reported in this publication, The Kindergarten Initiative.^{26,27} This test may already be conducted in some school districts, and data may be readily available. See <http://dibels.uoregon.edu/index.php> for more information on this system.

e) Impacts on academic performance

Grade point averages from schools with farm to school programs and control schools can be compared to determine impacts on this indicator. Many factors influence GPAs, so care should be taken to infer meaning from GPA data. Only one program cited in this report, The Edible Schoolyard,²⁸ has examined this outcome.

f) Psychosocial adjustment

A standardized student report questionnaire has been developed by The Edible Schoolyard²⁸ to assess this outcome for students in a farm to school program, as compared to students in a control school.

g) School attendance records

School attendance records are usually readily available from district offices. If tracked over a period of time and taking into account other variables, these can be used to draw inferences regarding student health.

Teacher Impacts

Examples of tools used in assessing teacher impacts (see appendices p 163-165):

- › Teacher Focus Group Questions and Guide – Burlington School Food Project^{14,46}

a) Changes in teacher and administrator knowledge and attitudes

Surveys can be used to assess teacher or school administrator knowledge about local foods, nutrition and health, gardening, etc.; however these will need to be specifi-

cally tailored to outcomes of interest. None of the programs studied for this report have used surveys to assess this indicator; though some have used informal discussions and interviews with the teachers and school administration. For example, the Burlington Farm to School project has conducted focus group discussions with teachers participating in the farm to school program.

Policy Impacts

Impacts on policies are important measures of whether a farm to school program has facilitated systemic changes in the school food environment and school food policies.

a) School food policies

Monitoring of school food policies at the district level doesn't necessarily require specific survey tools. A copy of the food/wellness policy is usually posted on the district's website and may also be available through the district office.

Examples of tools used in assessing policy impacts (see appendices p 166-172):

- › Sample School Wellness Policy – Berkeley Unified School District²⁹
- › Sample State Policy – Oklahoma HB2655³⁰

b) City, county, state and federal level policies

Public policies that are supportive of farm to school and other community-based food systems work.

Food Service Impacts

School food service plays a crucial role in implementing change at the cafeteria level in most farm to school programs. The program has more chances of being sustained without external support if it has successfully impacted food service operations, working towards making the farm to school purchasing approach financially viable for the district. An assessment of the processes and factors influencing changes to food service practices is a significant gap in farm to school literature.

a) Financial viability of food service programs

- ▶ Cost per farm to school meal: To calculate the real cost of serving a farm to school meal, data on cost of food, labor, equipment, and other costs from the school food service will be needed. Often, this data is presented in comparison with cost per non-farm to school meal option.
- ▶ An in-depth analysis of income generation and expenditures for the farm to school portion of food service or nutrition education programs can be carried out. Financial data may not be readily available with the school district in a

Examples of tools used in assessing food service impacts (see appendices p 173-184):

- › Template for Assessing Financial Viability of Farm to School Programs¹⁸
- › Rethinking School Lunch Financial Calculator¹¹
- › Assessing food service experience with using local foods– a template⁵
- › K-12 Food service periodic check-in – a template⁵
- › Local Food Purchases Record⁵
- › Sample questions for food service staff¹⁴
- › Sample Waste Audit Template³⁴
- › Food Service Director Interview Protocol – UC SAREP
- › Salad Bar Coordinator Interview Protocol – UC SAREP

format that you need. Collecting this information will require the cooperation of the school administration and staff, who may be wary of divulging financial information about the district's operations. Depending on the type of record keeping at the school district, it may also be difficult to separate out incomes and expenditures for the farm to school programming.

- ▶ Rethinking School Lunch Financial Calculator.¹¹ This tool is designed to forecast the financial impact of rethinking food service models. The calculator contains several individual worksheets that track income and expense categories for a school district of up to 15 schools from elementary through high school. The worksheets are optimized to support “fresh prep,” farm to school lunch programs that promote healthy outcomes for students.

b) Cafeteria meal participation

Since meal participation rates correspond to revenue for school food service, gathering this data is important, especially in schools with a high number of students qualifying for free or reduced price meals. Meal participation data is available from school food service offices, and tracking this over a period of time can provide insights into the effects of any cafeteria-based changes due to the farm to school programming. One factor to consider in addition to student meal participation is teacher/staff participation, as these adult meals, often priced higher than student meals, can add revenue to the school food service budget.

c) School food procurement trends

The volume and dollar value of local food purchased can be calculated from procurement records or invoices available from the school district. Sales records from food service vendors can also provide this information, though this may not be easy to elicit if the program uses multiple vendors.

d) Cafeteria offerings

One way to measure changes in the quality and nutritional value of cafeteria meal options is to examine food procurement records. These records may be requested from the food services division of the school district. Possible changes may be calculated for specific food groups, such as number of servings of fresh fruit and vegetable, or whole wheat and grains offered, or the amount of local products featured for a farm to school meal, as compared to the non-farm to school meal option.

e) Waste management and recycling practices

Audits can be conducted to assess changes in waste streams at farm to school sites implementing a waste management program. Several online resources are available for establishing and assessing waste management and recycling programs in schools.³¹⁻³⁴

f) Food service staff knowledge and attitudes

Program-specific surveys, informal interviews, or focus group discussions can be conducted to assess any changes in the knowledge and attitudes of food service staff as a result of the farm to school program.

Farmer Impacts

A major goal of the farm to school approach is to increase farm viability and enhance opportunities for local agriculture. Though limited, some information on tools used to assess these impacts is given below:

a) Farmer profitability

Analysis of farmers' sales records can provide information on how much farm to school sales contribute to overall farm income. However, this data is not easily available, and if it is, can be very time consuming for a farmer or researcher to calculate. Often the farmer can provide an educated guess on this question during an interview.

b) Number of farms participating in area farm to school programs

This data reveals the breadth of the impact of a farm to school program on local agriculture.

Examples of tools used in assessing farmer impacts (see appendices p 185-188):

- › Farmer Interview Protocol - UC SAREP
- › Farmer Survey – National Farm to School Network³⁵

c) Farming and marketing operations

Interviews with farmers can provide information on any changes in their farm operations that have occurred as a result of the farm to school program. Some of these may include diversification of products, changes in planting patterns and marketing channels, establishment of processing facilities, as well as participation in collaborative or cooperative marketing structures.

Parent Impacts

a) Parental knowledge, attitudes and behaviors

Examples of tools used in assessing parent impacts (see appendices p 189-190):

- › Healthy City Parent Survey - Burlington School Food Project¹⁴

These attributes regarding food and nutrition and local agriculture can be assessed before and after the program through surveys or focus group discussions. An increase in parental involvement in the school can also be an indicator of parent impacts of the farm to school program. Only a few farm to school programs have developed tools to assess program impacts on parents.

Community Impacts

Examples of tools used in assessing community impacts (see appendices p 191-196):

- › Vermonter Poll - a statewide poll conducted to assess parental knowledge and attitudes about school lunch and children's eating behaviors¹⁴
- › Questions for food council members - Burlington School Food Project¹⁴
- › Project Partners Interview Guide - Burlington School Food Project¹⁴
- › Volunteer Interview Guide - Burlington School Food Project¹⁴

Unlike other school-based educational or cafeteria programs, farm to school has the potential to impact families and the community at large due to its broad-based collaborative approach that aims to involve parents, gardeners, farmers, and community members. Informal discussions and interviews with key community members and stakeholders such as project partners, volunteers, food council, or committee members can reveal useful information about the impacts of farm to school programs in the community. Some impacts worth monitoring include the growth of farmers' markets in the area, campaigns or organizing efforts around other food related issues facing the community, and food dollars spent within the local economy.