

Evaluating Food Service Guidelines in Cafeteria Settings

This document provides considerations for conducting performance measurement and evaluation activities related to food service guidelines and nutrition standards. For more information about food service guidelines, please visit: <https://nopren.ucsf.edu/food-service-guidelines-work-group>

Contents

Section 1: Overview and Purpose	1
Section 2: Implementation Performance Measures	2
2.1 FSG Implementation Performance Measure Overview	2
2.2 Written Agreements	2
2.3 Facility Audits	3
Section 3. Assessing Food Service Guidelines for Outcome Evaluation	5
3.1 Overview and Adapting the Outcome Evaluation Question to the Setting	5
3.2 Determining and Using Outcome Evaluation Data Sources in Settings Where Foods Are Sold.....	6
3.3 Determining and Using Outcome Evaluation Data Sources in Places Where Foods Are Served.....	8
3.4 Understanding Types of Data Sources: Point of Sales	10
Table 1. Examples of Food Category Outcomes for Evaluating Food Service Guidelines Using Point-of-Sales (POS) Data	12
3.5 Understanding Types of Data Sources: Procurement (Purchasing) Records	14
Table 2. Examples of Food Category Outcomes for Evaluating Food Service Guidelines Data	15
3.6 Understanding Types of Data Sources: Production Records	18
3.7 Understanding Types of Data Sources: Menus	19
Appendix A: Sample Short-Term Measures from L.A. County	20
Appendix B: Sample Written FSG Agreements	20
Appendix C: Example Modifiable FSG Compliance Checklist (Excel)	20

Section 1: Overview and Purpose

This document provides considerations for conducting performance measurement and evaluation activities related to food service guidelines and nutrition standards (FSG). It is intended to augment the Center for Disease Control and Prevention's *Smart Food Choices: How to Implement Food Service Guidelines in Public Facilities (Smart Food Choices Guide)*, which is another useful tool for the implementation and evaluation process. The *Smart Food Choices Guide* includes a sample logic model (page 23) as well as general planning and monitoring tools. This guide can be found at:

<https://www.cdc.gov/obesity/downloads/strategies/Smart-Food-Choices- 508.pdf>

Overview of Performance Measures

- Short-term performance measures address milestones to get to implementation. They seek to determine whether the appropriate steps are being taken to successfully implement the FSG. For examples of short-term performance measures, see Appendix A.
- Implementation performance measures assess the extent to which FSG have been implemented in a facility.
- Outcome measures assess the extent to which healthier foods are purchased/taken/procured/served compared to before implementation. **Outcome evaluation requires the collection of baseline data before implementation.** Ideally, evaluation should be done on a continuous basis, quarterly, semi-annually, or annually, to monitor and improve FSG overtime.

Given that available evaluation data sources may differ across food service settings and venues, it is useful to group the settings where FSG are being implemented into the following categories:

- Settings where foods are **sold** (e.g., worksites or community settings with cafeterias, vending machines, or concession stands)
- Settings or programs where foods are **served** (e.g., correctional facilities, afterschool programs)

Cafeteria settings where foods are sold or served often keep business records of foods purchased or sold which can be used for evaluation purposes. These data sources, and considerations for using them, are discussed in this document. Smaller, independently run venues may not keep detailed business records.

Section 2: Implementation Performance Measures

2.1 FSG Implementation Performance Measure Overview

To evaluate implementation performance of FSG, the best practice is to gather two pieces of evidence: 1) a written and signed agreement documenting the agreed-upon FSG standards and how they will be implemented (see section 2.2); and 2) a completed facility audit or assessment documenting the facility is in or working towards compliance with FSG implementation (see section 2.3). These measures indicate the extent to which FSG have been successfully implemented.

2.2 Written Agreements

Written FSG agreements help to ensure sustainability of FSG in the context of common barriers, including staff or organizational leadership turnover at the facility, department, or institution and miscommunication with food service staff and administrators over specific FSG requirements and responsibilities. Types of official written agreements may include:

1. Contracts with food service providers
2. Permits for vending machines, concession stands, micro-markets, etc.
3. Healthy food purchasing or procurement agreements
4. Organizational policy
5. State or municipal legislative or administrative policy
6. Memorandums of agreement or understanding (MOA/MOU)

Optimally, agreements should address the following elements:

1. **Adopting Institution:** Identify the organization or facility that is to adopt FSG in cooperation with relevant partners (if applicable).
2. **Included Venues:** List the relevant venues (cafeterias, vending machines, etc.) that will be subject to FSG.
3. **Standards:** Delineate the FSG (food, nutrition, and behavioral design, etc. standards) that the included venues will adopt.
4. **Data Collection Provisions:** Outline the food service operator's data reporting requirements, including data reporting timeline and data sharing requirements (See section 3.1 for the types of data that could be used).
5. **Training and Technical Assistance:** Detail staff training plans.
6. **Monitoring:** Include provisions for compliance or monitoring over time (e.g., identify who is responsible for monitoring).
7. **Assign Responsibility:** Specify roles and responsibilities of those who will carry out the activities.

Several examples of agreements can be found in *Appendix B*.

2.3 Facility Audits

Documenting venues' compliance with FSG is important for assessing implementation progress and sustainability. It is recommended that you conduct a facility audit at baseline and then periodically (e.g., semi-annually, biannually, or annually) after FSG are adopted or phased in. This will allow you to document changes in food offerings due to FSG implementation.

The following describes preferred methods for conducting facility audits.

Using Compliance Checklists

A compliance checklist enables straightforward documentation of a venue's compliance with each component of the FSG specified in the written agreement. In general, most checklist items will measure whether the foods and beverages that are offered at a facility meet FSG standards. An example of a checklist can be found in Appendix C. Because specific standards can vary between jurisdictions or facilities, this checklist may be customized. Ideally, the same tool should be used to conduct a baseline assessment prior to implementation so you can track the same indicators over time.

Some checklist items may be able to be assessed by a staff member with minimal training and with minimal assistance from the facility manager and food service staff. However, the amount of time and assistance required will depend upon the specific standards being assessed. For example, standards specifying the availability of a minimal number of fruit or vegetable options may be easy to measure. Standards based upon nutrients or ingredients (e.g. sodium or saturated fats) may be more difficult to assess if the facility does not display nutrition labels and will require more extensive assistance from facility management. Ensuring that the adopted FSG include requirements for nutrition labeling or signage to indicate healthier items will not only assist patrons in selecting healthy options but also facilitate assessment of compliance. Finally, standards specifying that certain foods be made available on a regular but non-daily basis (such as fish served several times per week) may also require examination of menus or consultation with staff.

Compliance Check of Nutrition Requirements for Packaged Snacks

The Food Service Guidelines for Federal Facilities and some other FSG require that a certain percentage of packaged or vended foods and beverages meet specific ingredient and nutrient requirements. This usually cannot be assessed with a simple visual audit of the venue. Assessment of all available packaged foods requires careful reading of nutrition facts and ingredient lists. This can take much time and effort in cafeteria venues and may not be possible in vending machines where the items cannot be accessed without purchasing. There are several shortcuts to assessing this standard that can reduce time required.

1. Create and periodically update lists of specific packaged products that are already known to meet the standards and limit offerings to products on the list.
 - a. Product lists are likely already available for certain standards (e.g., Smart Snacks in School standard).
 - b. Useful in vending machines where ingredient lists and nutrition fact panels on items cannot be inspected.
2. If you are using FSG that align with the Smart Snack standards, use calculators currently available to assess whether packaged items meet standards. One example can be found at <https://foodplanner.healthiergeneration.org/calculator/>
3. Implementing signs or symbols to identify foods that meet standards can help shorten the time required to assess the proportion of items that meet standards. It is recommended to occasionally check whether the healthy item identifier signs are properly assigned to items that truly meet standards.
4. Take pictures of the packaged snacks and beverages to document the nutrition facts panel and ingredient list for later analysis.

It is important for decision makers to specify the frequency that compliance checklists must be completed for each facility to ensure the sustainability of FSG efforts. In some cases, facility managers can complete some or all the compliance checks after they are sufficiently trained to do so. Including checklist completion in food service contracts and other written agreements is a good way to ensure long-term sustainability of compliance. Periodic training and independent inspections by personnel outside the facility should be included to ensure data quality and consistency. When this is not possible, worksite wellness committee members (if applicable) can be trained to aid in compliance monitoring.

Audit results should be shared with the food service management and other key facility stakeholders. If the FSG are not being met in whole or in part, a plan should be developed to bring the facility into compliance.

Section 3. Assessing Food Service Guidelines for Outcome Evaluation

3.1 Overview and adapting the outcome evaluation question to the setting

Before beginning the evaluation, it is important to identify the outcome evaluation question(s).

Below are potential outcome evaluation questions for FSG in settings where food is sold.

To what extent have efforts to implement FSG in settings where food is sold led to increased purchasing of healthier foods and beverages? To what extent has this occurred among priority populations?

Below are potential evaluation questions in settings where food is served.

To what extent have efforts to establish FSG led to:

- *increased procurement of healthier foods and beverages?*
- *increased sales of healthier foods and beverages?*
- *increased serving of healthier foods and beverages?*

It is important to determine the types of data that could be used to conduct the evaluation and which types are already available in the venues that are being evaluated. Below are potential data sources for consideration.

- **Procurement data:** records of the foods purchased or ordered by a facility or program. It is relevant in many settings.
- **Point of sales (POS) data:** sales records of foods sold to consumers. It is only relevant in facilities where foods are sold.
- **Menu data:** records of the meals offered and/or served. May be relevant for evaluation when foods are served from a set menu with consumers having little choice of which foods they receive. In this scenario, measuring the foods offered is a good proxy for the foods consumed.
- **Production data:** quantitative records of foods prepared or served. For example, the number of trays served of an entrée or side dish.
- **Point-in-time assessments or surveys:** ad-hoc measures taken on a sample of days. Some examples include: an assessment of foods served at a church meal or an assessment of the foods served at an after-school setting on a sample of days. They can be developed and used when other data types are not available.
- **Key informant interviews:** interviews with food service managers, staff, or customers to get qualitative feedback on implementation, barriers, successes, and change over time.

However, the types of data that can be used to evaluate FSG outcomes may vary by setting type because not all food service operators and venues collect or are able to share the data types mentioned above. For example, not all cafeterias collect itemized point of sales data (e.g., “healthy entrée item” not programmed into POS system, etc.). Considerations for using each type of data are described in sections 3.4-3.7.

3.2 Determining and Using Outcome Evaluation Data Sources in Settings Where Foods Are Sold

Key Considerations

Foods and beverages are made available for sale in cafeterias, snack bars, and vending machines at many worksites, health care facilities, parks, and recreation facilities. Because customers pay for the foods they purchase, itemized sales records are often recorded at the point of sale (POS). These data are useful in that they directly measure the foods that are acquired by consumers. However, POS data can vary in specificity and utility for evaluation purposes. Procurement data that records the bulk-packaged food and beverage items purchased by the owner or operator of the cafeteria, snack bar, or vending machine are also often available. While these data are useful for measuring many key healthy or less healthy items, they are not as useful for assessing prepared foods that combine multiple ingredients. The healthfulness of entrées, sides, and desserts that are prepared onsite can vary greatly according to recipes and preparation methods. In the absence of POS data, food production data may be useful for assessing these prepared foods. Menu data are not as useful for long-term evaluation where foods are sold because consumers may select less healthful items from those available.

Steps to Use Sales, Production, or Procurement Data

- 1. Availability of Data:** Determine the availability of point of sales (POS), procurement, or food production data in facilities where FSG are being implemented.
 - a. Meet with food service managers to determine how data is currently captured. This could be included in a key informant interview. Is it available electronically or only in paper records? How far back in time can procurement records be obtained to allow for baseline (pre-intervention) measurement? How easily can records from each supplier be obtained?
 - b. If FSG are being implemented in multiple facilities, determine which facilities can feasibly provide relevant data that will be useful for long-term evaluation. Focus your outcome evaluation efforts on these facilities.
- 2. Obtaining Data to Determine Measures:** Obtain examples of available POS, food production, and procurement data from the facility manager to assess their utility for evaluation purposes. These can be the most recent records or what is easiest for a venue to share.
- 3. Determining Potential Assessment Measures:** Review the examples of available data to determine what can be measured. Establish a set of potential measures of healthy and less healthy food and beverage selection or consumption. These should correspond with the FSG being implemented (see Table 2). These potential measures should be the same across all facilities being evaluated that are using the same FSG.
 - a. Examine actual POS or procurement records to determine foods and beverages that can be easily differentiated as healthy or less healthy. For example, if you wish to measure the impact of nutrition standards for healthy beverages, do beverage procurement records clearly differentiate purchases of bottled/canned sugary drinks from bottled/canned zero calorie beverages such as diet drinks or bottled water? If you wish to measure the impact of nutrition standards for whole grains, do bread procurement records clearly differentiate whole grain from refined grain bread products?

4. **Selecting Assessment Measures:** From your list of potential measures, select a limited set of measures of healthy and less healthy food and beverage consumption.
 - a. Selected measures should correspond well with specific FSG.
 - b. Selected measures should be captured in records that can be obtained relatively easily for the time period of interest.
5. **Obtaining Data for Evaluation:** When feasible, obtain relevant records from the facility manager for the pre-intervention and post-intervention time periods.
 - a. Ensure long enough time periods are selected to ensure that repeating menu cycles and/or lags in procurement due to food storage are accounted for, i.e., if non-perishable foods are ordered infrequently, wait until a non-perishable foods order can be accounted for as well.
6. **Collect Relevant Data:** Collect data corresponding to your selected measures from the appropriate records.
 - a. Transcribe relevant values and dates from records for selected measures into a database.
7. **Analyze Data:** Compare sales and/or procurement amounts of selected food and beverage categories during pre-intervention and post-intervention periods. For example:
 - a. Assess whether selected healthy foods or beverages increased sales or procurement from pre-to post-intervention
 - b. Assess whether selected unhealthy foods or beverages decreased sales or procurement from pre- to post-intervention
8. **Share Results and Make Adjustments:** Share evaluation results with food service operators to inform future adjustments to FSG implementation. For example, if increasing the variety of vegetable dishes did not lead to increased selection of those dishes, adjustments could include implementing new behavioral design strategies or finding new recipes to encourage increased sales.

3.3 Determining and Using Outcome Evaluation Data Sources in Places Where Foods Are Served

Key Considerations

Compared to facilities where foods are sold, there is generally less choice in the variety of foods served to program participants or facility residents. In some cases, everyone receives the same foods and beverages. Therefore, data sources for evaluation may differ. While procurement and food production data may still be relevant in these situations, POS data is probably not applicable or available. However, the lack of variety of choices may mean that menus closely correspond to foods consumed by participants or residents. These menus are usually available and often involve recurring cycles of one or more weeks consisting of foods prepared using standardized recipes. Therefore, menu and corresponding nutrition data may be a useful proxy for the foods consumed in these types of settings.

Steps to Use Procurement, Production, or Menu Data

- 1. Availability of Data:** Determine the availability of procurement, production (if foods are prepared on-site), or menu data in facilities or programs where FSG are being implemented.
 - a. Meet with facility or program managers to determine how each type of data is currently captured.
 - i. Is it available electronically or only in paper records?
 - ii. How far back in time can procurement, production, or menu records be obtained to allow for baseline (pre-intervention) measurement?
 - iii. How easily can procurement records from each food distributor source be obtained?
 - iv. Is there a repeating menu cycle?
 - v. Are recipes and/or nutrition information available for prepared foods that are served?
 - vi. How is production data recorded and how precise are these records?
 - vii. How much work on behalf of the facility or program manager is required to obtain these records?
 - b. If FSG are being implemented in multiple facilities, determine which facilities can feasibly provide relevant data that will be useful for long-term evaluation. Focus your long-term evaluation efforts on these facilities.
- 2. Obtaining Data to Determine Measures:** Obtain convenience samples of available procurement, production, or menu data from the facility manager.
 - a. These can be the most recent records or whatever is easily obtained. They are only for assessing the potential utility of available data sources and do not need to cover the entire intervention period.
 - b. Select data sources that facility managers can obtain without excessive work burden.
- 3. Determining Potential Assessment Measures:** Establish a set of potential measures of healthy and less healthy food and beverage categories or nutrients that correspond with specific nutrition standards being implemented.
 - a. Examine actual procurement or production records to determine foods and beverages that can be easily differentiated as healthy or less healthy.

- i. For example, if you wish to measure the impact of nutrition standards for healthy beverages, do the beverage procurement records clearly differentiate purchases of bottled/canned sugary drinks from bottled/canned zero calorie beverages such as diet drinks or bottled water? If you wish to measure the impact of nutrition standards for whole grains, do bread procurement records clearly differentiate whole grain from refined grain bread products?
- b. If using menu data, diet quality of menu items due to FSG may also be a feasible outcome evaluation measure using an indicator like the Healthy Eating Index.
 - i. Before choosing this outcome, determine if your team has the required data analysis expertise. Note that food group and nutrient databases for prepared foods used to calculate diet quality scores are usually based on standard recipes. Therefore, actual prepared foods from the facility may differ from standard recipes in terms of food groups or nutrients, especially if the recipe has been modified to make it healthier. For example, a facility may have modified a recipe to contain less sodium than that of a typical recipe.

4. Selecting Assessment Measures: Select a limited set of measures for healthy and less healthy foods (for procurement, production data, or menu data) or an indicator of diet quality (for menu data).

- a. Measures that are selected should correspond well with specific nutrition standards.
- b. Measures selected should be based on records that can be obtained relatively easily for the time period of interest.

5. Obtaining Data for Evaluation: Obtain relevant records from the facility manager for the pre-intervention and post-intervention time periods.

- a. If using procurement or production data, ensure long enough time periods are selected to ensure that repeating menu cycles and/or lags in procurement due to food storage are accounted for, i.e., if non-perishable foods are ordered infrequently, wait until a non-perishable foods order can be accounted for as well.

6. Collect Relevant Data: Collect data for relevant food and nutrition information from data.

- a. Transcribe data relevant to selected measures into a database.

7. Analyze Data: Analyze changes in selected food, beverage, nutrient, or diet quality outcomes.

- a. Assess whether selected healthy foods, beverages, or nutrients increased from pre- to post-intervention.
- b. Assess whether selected unhealthy foods, beverages, or nutrients decreased from pre- to post-intervention.
- c. Assess whether diet quality of the set menu cycle improved from pre- to post-intervention.

8. Share Results and Make Adjustments: Share evaluation results with food service operators to inform future adjustments to FSG implementation. For example, if increasing the variety of vegetable dishes did not lead to increased selection of those dishes, adjustments could include implementing new behavioral design strategies or finding new recipes to encourage increased sales.

3.4 Understanding Types of Data Sources: Point of Sales

Overview

Point of sales (POS) systems (e.g., cash registers) record purchases made by consumers in cafeterias, snack bars, or other venues. If a POS system is properly equipped and programmed to capture the required details of foods and drinks sold, the resulting data can provide the most direct evidence of changes in sales of healthy or less healthy food items. This might not be as true with vended foods since the data is linked to slots, not the products. If the machine has not been stocked consistently, with the same product in the same slot, the data might not be as useful.

These systems can vary greatly across facilities in their ability to capture useful data for evaluation. Most modern POS systems, if properly programmed, can produce highly detailed database records automatically as transactions occur. However, some older systems still in use do not record any electronic data and some new systems are not programmed to adequately capture the healthfulness of products purchased.

Challenges

Based upon the experiences of the authors, there is currently great variation across cafeterias in the utility of data captured by cafeteria POS systems to measure the healthfulness of foods sold due to the issues outlined below. If the POS data in the facility does not capture enough detail for the evaluation and the facility manager is not willing or able to modify the system, other data sources will need to be used.

1. No Usable Sales Data. POS systems at checkout may be set up for attendants to simply enter the prices for items purchased without inputting the type of food. This could be due to the inherent limitations of the POS equipment or due to the POS equipment not being adequately programmed. The system may not be capable of outputting any electronic sales data or the data produced does not identify specific item names. If this is the situation, consider using other data sources.
2. Sales Data but No Differentiation of Products. POS systems may be equipped to capture sales data but are not programmed to capture it with enough specificity to identify product categories of interest or the categorization scheme may not sufficiently differentiate healthier or less healthy selections within a product category. For example, a system may capture that an entrée and side item was sold but not differentiate whether the entrée was a grilled chicken sandwich or bacon cheeseburger or whether the side was steamed vegetables or French fries.

While it may be possible to reprogram POS systems to capture data required for evaluation, such efforts will likely result in a significant burden to facility managers in terms of the time required to reprogram the system and train staff.

3. Sales Data with Mixed Differentiation of Products. Although food items may be easily discernible, some food items, such as fountain drinks or salad/hot bar items, may not be. This can make it impossible to use POS data to differentiate between sugary drinks and non-calorically sweetened soft drinks from the soda fountain or to differentiate between fried chicken strips and green salad from the salad bar. It should be noted that fountain drink and salad bar selections are consistently difficult food items to record accurately in terms of consumer selection of healthier and less healthy items. For this reason, efforts to evaluate sales using POS data can be complemented by the use of procurement and/or production data for products that are not adequately captured through POS data.
4. Inconsistent Differentiation of Products Across Facilities. POS systems may be set up to capture data on healthy and less healthy food sales, especially if facilities are operated by large food service companies.

However, if evaluation efforts involve multiple facilities, there are likely to be inconsistencies in POS data between facilities.

Evaluation Planning Using POS Systems

When planning your evaluation, meet with facility managers to investigate how POS systems are currently utilized in each facility and the sales data that are currently captured. Based upon available sales data, it may be possible to evaluate specific food items or categories that are already captured, even if it is not possible to measure sales changes relevant to all food standards implemented.

A subset of your facilities may already capture useful consumer sales data. Therefore, you may wish to use those facilities to represent all consumer sales data in your evaluation, complementing other evaluation data sources collected across a larger number of facilities. Alternately, it may be possible to work with facility managers across several facilities to develop a simple way to record a limited set of important healthy or less healthy product items (see sample categories in Table 1). For example, facilities may agree to accurately record healthy entrée sales on each day, healthy side items, or selected a la carte items such as fresh fruit or bottled water.

The product categories that you decide to measure using POS data should:

1. Reflect important FSG requirements that have been adopted
2. Be sold in large enough sales volumes that they could have a meaningful impact on the healthfulness of foods purchased by facility customers
3. Be easy for POS operators to consistently differentiate and record when checking out customers
4. Be reasonably easy for facility managers across facilities to program into their POS systems

To ensure the product categories can meet the requirements above, talk them through with the facility manager and examine sample POS data.

Table 1. Examples of Food Category Outcomes for Evaluating Food Service Guidelines Using Point-of-Sales (POS) Data

Potential Healthy Food Categories to Measure Using POS Data
Whole Fruit
Cut Fruit/Fruit Salad (With No Added Sugars)
Healthy Entrées Meeting Sodium, Non-Fried, And Other Standards
Cooked Vegetables
Bottled Water
Bottled, Low-Calorie Beverages
Nuts, Low- Or Non-Fat Yogurt, Hummus/Veggie Combos, Or Other Healthy Snacks
Side or a la Carte Salads
Potential Less Healthy Food Categories to Measure Using POS Data
Desserts
Less Healthy Entrees (Might Include Fried Items, High Sodium Entrees, Hamburgers, Pizza, Hot Dogs, or Other Processed Meats)
French Fries
Candy
Sugary Drinks

Menu Cycles

Many cafeterias run on menu cycles where the specific entrees and sides follow a repeating pattern over one or more weeks. Since some food items may be more or less popular than others, total sales and/or sales of healthier or less healthy foods may vary on different days of the menu cycle. Therefore, menu cycles should be considered when collecting sales data on foods purchased pre-implementation and post-implementation. Each observation period should contain at least a full menu cycle and should ideally comprise multiple full menu cycles for each observation period. Sales per menu cycle can be a meaningful and relevant time unit by which to measure sales.

Total Sales Volume

Total business volume also varies for most facilities during the year. In many workplaces, employees may take vacation during certain times of the year such as the weeks surrounding Thanksgiving, Christmas, New Years, Easter, or during children's school breaks. During these times, cafeteria business volume may decline due to less people being in the office. To account for variation in total sales volume, sales of particular items of interest should always be adjusted according to total sales volume (of all items). An example formula is below:

Adjusted healthy entrée sales for a given menu cycle = (Actual sales volume of healthy entrees during menu cycle ÷ Total sales volume during menu cycle) X (Total sales volume for entire study ÷ Number of menu cycles in entire study)

As an example, you are interested in measuring the impact of implementing food service guidelines on sales of healthy entrees. However, the number of people purchasing lunch at the cafeteria fluctuates over the year due to holidays and vacations and was lower during the intervention period than during the pre-intervention period. Therefore, the actual mean weekly sales during the intervention period may not be comparable to those during the pre-intervention period. You need to adjust the actual sales of healthy entrees according to sales volume to make them more comparable. In this case, you are looking to see if average sales of healthy entrees per 1-week menu cycle have increased. After the study has concluded, you have weekly sales of healthy entrees and total weekly sales volume (total number of items sold) for every week during pre-intervention (baseline) and intervention period.

In a given week, 300 healthy entrees were sold and there were 5000 total items sold. During the entire 20-week study period (10 weeks pre-intervention and 10 weeks intervention), a total of 124,000 total items were sold.

The adjusted sales of healthy entrees for this week would be: $(300 \text{ actual number of healthy entrees sold during week} / 5000 \text{ total items sold during week}) * (124,000 \text{ total items sold over entire study} / 20 \text{ week in entire study}) = 372$

This calculation would then be repeated for every week of the study. The mean adjusted sales of healthy entrees during the intervention period could be compared to the mean adjusted weekly sales of healthy entrees during the pre-intervention period accounting for differences in total sales volume between the pre-intervention and intervention period.

It may be difficult to obtain all sales data for the venue you are evaluating. You may start by asking for specific sales data, like the sales of grab and go items in the past month.

Amount of Data Needed

In addition to holidays, other factors may affect sales in ways that cannot be anticipated or predicted. Therefore, it is important to ensure that data are collected over a sufficiently long period of time so that unusual rises or falls in sales on a given day do not overly influence the results of the evaluation. For example, pre- and post-intervention data may consist of several months of sales data, each with multiple full menu cycles represented. Key informant interviews could help assess other fluctuations throughout the year. Conducting evaluations multiple times a year may also help address this issue.

3.5 Understanding Types of Data Sources: Procurement (Purchasing) Records

Overview

Procurement or purchasing data reflects the foods and beverages purchased by the food service operation for subsequent sale (such as pre-packaged foods and beverages) or use in the production of items for sale (i.e., ingredients used to prepare dishes). The foods may be purchased from food distributors, warehouse clubs, or even supermarkets.

One of the advantages in using this type of data is that it is usually collected already as part of normal business practice and therefore does not pose a large additional burden on facility managers. Community settings where foods are served rather than sold to community members may also find this data to be useful.

For cafeterias, procurement data may be compiled for facilities by food distributors. Furthermore, since a significant segment of food distribution in the United States is performed by a small number of large national companies, a large portion of procurement data across facilities may consist of similarly formatted data from several overlapping companies.

Challenges

One principle challenge of using procurement data for evaluation purposes is that it does not always precisely correspond with the foods purchased or eaten by consumers. This is especially true when ingredients purchased are incorporated into recipes prepared at food service facilities. Another disadvantage of using procurement data to evaluate FSG is the potential time lag between when foods are purchased by the facility and when they are purchased by consumers. This time lag may differ by facility and food type. For example, time lags will likely be shorter for perishable foods such as fresh fruits and vegetables and bread products compared to nonperishable foods such as canned goods. Time lags may also differ between facilities depending on storage space available. You can account for these time lags by examining procurement over longer time periods, examining the frequency of purchasing for specific product categories at a given facility, and by asking facility managers about purchasing schedules. Finally, procurement records may not be in a format that can easily be directly imported into a database. As such, extraction of relevant data from procurement records may involve a substantial amount of manual data entry from a large number of documents. This may be true of other data sources as well.

Practical Application of Procurement Data for FSG Evaluation

Procurement data is a useful proxy for changes in the sales of healthy and less healthy foods in cafeterias and many community settings. It is recommended that procurement data be categorized into specific healthy and less healthy food categories that correspond with specific FSG nutrition standard requirements. Some example categories and the corresponding FSG standards from *Food Service Guidelines for Federal Facilities* are listed in Table 2.

Table 2. Examples of Food Category Outcomes for Evaluating Food Service Guidelines Data

See Appendix C for additional guidance on how to interpret the FSG requirements.

Table 2. Examples of Food Category Outcomes for Evaluating Food Service Guidelines Procurement Data

Nutrition Standards in Food Service Guidelines for Federal Facilities	Potential Proxy Measures Using Procurement Data	Potential Proxy Measures Using POS Data	Potential Proxy Measures Using Production Data	Potential Proxy Measures Using Menu Data
Fruit <ul style="list-style-type: none"> Offer a variety of at least 3 fruit options daily, with no added sugars. Fruit can be fresh, canned, frozen, or dried Offer seasonal fruit 	<ul style="list-style-type: none"> Pounds/units of: <ul style="list-style-type: none"> Fresh fruit purchased Frozen fruit purchased Canned fruit packed in 100% juice purchased Percent of canned fruits purchased packed in only 100% juice out of all canned fruit Number of varieties of fresh fruit purchased 	<ul style="list-style-type: none"> Sale of: <ul style="list-style-type: none"> Whole fruit Fruit cocktail Cut/prepared fruit Fruit chosen for entrée side 	<ul style="list-style-type: none"> Number of trays/units prepared, offered, or sold for: <ul style="list-style-type: none"> Cut fruit for salad bar Entrée side option 	<ul style="list-style-type: none"> Number of times the following are planned to be served: <ul style="list-style-type: none"> Whole fruit Cut fruit Canned fruit packed in 100% juice Number of varieties of fresh fruit planned to be served
Vegetables <ul style="list-style-type: none"> Offer a variety of at least 3 non-fried vegetable options daily. Vegetables can be fresh, frozen, or canned and served cooked or raw Offer seasonal vegetables 	<ul style="list-style-type: none"> Pounds/units of: <ul style="list-style-type: none"> Fresh vegetables purchased Frozen vegetables purchased Canned vegetables purchased Number of varieties of fresh vegetables purchased 	<ul style="list-style-type: none"> Sales of <ul style="list-style-type: none"> Vegetable side dishes Side salads Entrée salads Salad bar 	<ul style="list-style-type: none"> Number of trays/units prepared, offered, or sold for: <ul style="list-style-type: none"> Hot vegetable side dishes Salad bar vegetable selections 	<ul style="list-style-type: none"> Number of times the following are planned to be served <ul style="list-style-type: none"> Hot vegetable side dishes Entrée salads Side salads

Grains

- Offer half of total grains as "whole grain-rich" products daily
- Offer a "whole grain-rich" product as the first (i.e., default) choice

- Proportion of bread products (loaf bread, rolls, bagels) purchased that are at least 51% whole grain
- Proportion of rice and pasta products purchased that are at least 51% whole grain
- Proportion of breakfast cereals purchased with whole grain as first ingredient

- Sales of:
 - Whole grain pasta or brown rice-based entrées
 - Brown rice, whole grain bread, or whole grain pasta sides
 - Sandwiches prepared on whole grain rolls, wraps, or bread

- Trays of whole grain bread or rolls used at sandwich making station
- Trays of whole grain-based side dishes such as brown rice, whole grain pasta, or whole grain rolls
- Pots/trays of oatmeal or other whole grain hot cereals prepared or sold

- Whole grain-based side dishes offered such as brown rice, whole grain pasta, or whole grain rolls
- Whole grain-based entrée dishes offered such as whole grain pasta or brown rice-based entrées
- Whole grain based products offered for sandwiches
- Whole grain hot or cold breakfast cereals offered

Dairy/Yogurt/ Cheese/Fluid Milk

- Offer a variety of low-fat dairy products (or dairy alternatives) daily, such as milk, yogurt, cheese, and fortified soy beverages
- When yogurt is available, offer at least one low-fat plain yogurt

- Proportion of milk, cheese, yogurt, and cottage cheese products purchased that are $\leq 1\%$ fat
- Proportion of yogurt purchased that are low-fat plain

- Sales of:
 - Low-fat milk
 - Low-fat cheese sticks
 - Cheese and cracker snack packs using low-fat cheese
 - Low-fat yogurt
 - Low-fat cottage cheese
 - Low-fat plain yogurt

- Number of trays/units prepared, offered, or sold for:
 - Low-fat shredded cheese, yogurt, or cottage cheese for salad bar
 - Low-fat cheese used at sandwich making station

- Low-fat milk, cheese, yogurt, or cottage cheese offered on menu
- Low-fat plain yogurt offered on menu

Beverages

<ul style="list-style-type: none">Provide free access to chilled, potable water.When milk and fortified soy beverages are available, offer low-fat beverages with no added sugarsWhen juice is available, offer 100% juice with no added sugarsAt least 50% of available beverage choices contain \leq 40 calories per 8 fluid ounces [excluding 100% juice and unsweetened fat free or low-fat (1%) milk]	<ul style="list-style-type: none">Proportion of juice products purchased that are 100% juiceProportion of bottled/canned soda, iced tea, energy, and sports drinks purchased that are zero/reduced calorieProportion of fountain drink soda kegs purchased that are zero/reduced calorieProportion of low- or nonfat milk and soy beverages with no added sugars purchasedFrequency of 100% vegetable juice purchasedAmount of bottled water purchased	<ul style="list-style-type: none">Sales of:<ul style="list-style-type: none">100% fruit or vegetable juice beveragesBottled/canned soda, iced tea, energy and sports drinks that are zero/reduced calorieBottled waterLow- or nonfat milk and soy beverages with no added sugars	<ul style="list-style-type: none">Containers of chilled free drinking water used during day or meal service	<ul style="list-style-type: none">100% fruit or vegetable juice offered in menuZero/reduced calorie bottled/canned soda, iced tea, energy and sports drinks on menuLow- or nonfat milk with no added sugars offered on menuFortified soy milk with no added sugars offered on menu
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Note that the use of procurement data from large food service facilities can require substantial work categorizing specific products purchased into useful categories. Evaluators may need to seek out additional information on the nutrition properties of specific products or standardize dissimilar units used to record sales of products within a category. For example, categorizing cereals according to whole grain content may require looking up nutrition information for specific cereal brands. Categorizing fresh vegetable purchasing may require combining different types of vegetables where some are sold in cases containing unit counts and others are sold by cases based upon weight.

3.6 Understanding Types of Data Sources: Production Records

Production records are used to record the amount of foods that are prepared, used, and discarded by food service staff for particular dishes. For example, these records would record how many trays of a particular entrée and side dishes were prepared on a given day, how many of these trays were served, and how many remained or were discarded.

These records are often used as part of normal food service business practices to measure waste and forecast how much of a food item should be prepared when it is served again in the future. An advantage of using production record data is that it measures amounts of complete dishes prepared and served during specific time periods rather than just the raw material ingredients procured over a larger time interval. Production records may also offer more specificity than POS data regarding entrees and side dishes, which may not be sufficiently differentiated in POS systems to measure sales of healthy or less healthy offerings. Production data also represents one of the only means to measure the healthfulness of foods selected from a salad bar since salad bar sales are usually recorded by weight and not by specific item selected.

A primary disadvantage of production data is that they may be prepared in an ad-hoc manner, may not be recorded consistently among staff, and may not be retained electronically over time. Nonetheless, if you plan ahead with the cooperation of facility managers, it may be possible to use production records to measure sales of healthy and less healthy entrees and side items prepared in the facility that are not easily captured by other types of data.

3.7 Understanding Types of Data Sources: Menus

Menus may offer relevant data for evaluation in settings where food is served, and consumers have little choice of which foods they receive. Some examples of these settings include correctional facilities, early care and education (ECE), and afterschool programs. In these scenarios, types and amounts of foods offered are useful proxies for the foods consumed. Conversely, menu data is usually not useful for outcome evaluation where foods are *sold* because a variety of healthy and less healthy foods are available to choose from and consumers may not choose healthy items.

If entrées, side dishes, and other items are prepared in-house, recipes may be required to determine nutrient composition. Nutrient analysis software is often needed to accurately determine the nutrient composition of composed meals and snacks. Data on packaged foods may be available on the packaging or online.

Relevant outcomes from menu data may include servings of fruits, vegetables, low-fat dairy, or whole grains, milligrams of sodium, as well as calories from added sugars and saturated fat. Use of diet quality indices such as the Healthy Eating Index may also be useful but computationally intensive. Further information of the Healthy Eating Index can be found here: <https://www.fns.usda.gov/resource/healthy-eating-index-hei>. A list of menu nutrient analysis software can be found here: <https://www.fns.usda.gov/tn/usda-approved-nutrient-analysis-software>.

Appendix A: Sample Short-Term Measures from L.A. County

Appendix B: Sample Written FSG Agreements

- [Executive Order 2018-001 Healthy Vending Policy on Baltimore County Property](#)
- [Food Service Guidelines in CDC -Owned or -Operated Dining and Vending Facilities](#)
- [Meigs Co. Health Department Food and Beverage Policy 2018](#)
- [State Bulk Food Solicitation 2017](#)
- [State Bulk Food Solicitation 2017 - Exhibit B1](#)

Appendix C: Example Modifiable FSG Compliance Checklist (Excel)