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School Nutrition and Meal Cost Study: Study Design, Sampling and Data Collection (Summary)

Background

The School Nutrition and Meal Cost Study (SNMCS) addressed a broad array of research questions grouped under four research objectives:

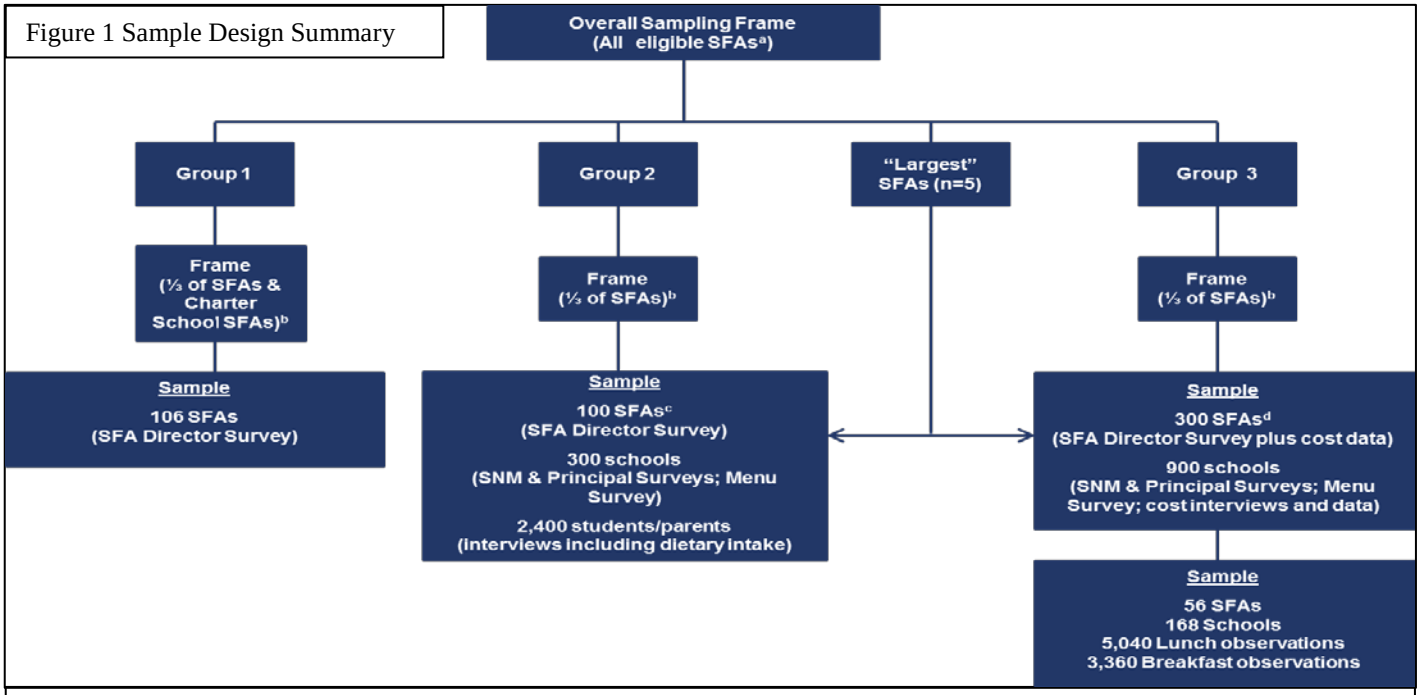
1. Describe School Food Authority (SFA) and school environments, foodservice operating policies and practices, student participation, and other characteristics of SFAs and schools participating in the National School Lunch Program (NSLP) and School Breakfast Program (SBP).
2. Determine the food and nutrient content of school meals and afterschool snacks and overall nutritional quality of the meals.
3. Determine the cost to produce reimbursable school meals (including indirect and local administrative costs) and examine ratios of revenues to costs.
4. Describe and assess student characteristics, participation, student/parent satisfaction (including plate waste), and dietary intake.

To address the research questions, the study collected a broad range of data from nationally representative samples of public SFAs, schools, students and parents in School Year (SY) 2014–2015. In addition, data were collected on the types and amounts of food wasted (plate waste) in reimbursable lunches and breakfasts served to or selected by students. Findings from the extensive analyses of data collected in the SNMCS are presented in four report volumes and a summary report. This methodology report describes the design of the SNMCS, as well as sampling, recruitment, data collection, and data processing procedures.

Study Design

The overall objective of the SNMCS sample design was to provide statistically precise estimates while minimizing data collection costs and respondent burden. The sampling approach involved first randomly dividing a sampling frame of all public SFAs into three separate

Figure 1 Sample Design Summary



Note: Sample sizes refer to target number of participating SFAs, schools, students, lunch observations, and breakfast observations

[a]School Food Authorities (SFAs) serving public schools in the contiguous (48) United States plus the District of Columbia. SFAs serving only institutional populations, or operated by States or the Federal Government were excluded, along with SFAs serving only private schools.

[b]One-third of SFAs after the 5 largest SFAs were removed; Group 1 frame also included all SFAs serving charter schools only.

[c]Group 2 sample included the 5 largest SFAs and 15 schools from those SFAs, plus 95 other SFAs and 285 schools from those SFAs.

[d]Group 3 sample included the same 5 largest SFAs and 15 schools (different than the ones selected for Group 2) from those SFAs; in addition, 295 SFAs and 885 schools were targeted to participate.

- Group 1 includes SFAs, but no schools were sampled. SFAs that serve only charter schools were represented in this group. Group 1 SFAs participated in the SFA Director Survey to provide the precision required for estimating SFA characteristics and policies.
- Group 2 includes SFAs, schools, and students and their parents. Group 2 SFAs participated in the SFA Director, School Nutrition Manager (SNM), and Principal Surveys. Interviews were conducted with students (and their parents) in these schools as well as dietary recalls.
- Group 3 includes SFAs, schools, and lunch and breakfast observations. A subset of SFAs and schools provided additional data needed to estimate meal costs. Plate waste was observed at a subsample of Group 3 schools.

Data Collection

Most data were collected from January to June 2015. Planning and pre-visit interviews took place from September 2014 to February 2015. Group 3 SFAs provided final data on costs and revenues for SY 2014-2015 in fall and winter of SY 2015-2016.

SFA directors in all three groups, along with principals and SNMs in Groups 2 and 3 provided data via self-administered web-based questionnaires. SNMs completed the web-based Menu Survey that collected detailed information about the foods offered and served in reimbursable meals and afterschool snacks during 1 school week, called the "target week." In Group 3 schools, an expanded Menu Survey collected additional information needed to estimate the total food costs of each meal served during the target week. On-site interviews with the SFA Director, Business Manager, School Nutrition Managers and Principals collected detailed information on a variety of cost-related topics in Group 3 SFAs.

In Group 2 schools, students and their parents were interviewed to collect information on student characteristics, dietary intakes, and participation in and satisfaction with school meals. For the 24-hour dietary recalls, students reported all dietary intakes spanning a midnight-to-midnight recall period to provide an estimate of students' intakes of food energy and nutrients on a typical school day. Elementary school students completed the 24-hour dietary recall with the assistance of their parents. A second day of dietary intake data was collected over the phone for a representative subset (approximately 27 percent) of students to enable calculations to estimate usual food and nutrient intake.

Observations of plate waste provided information on the proportion of foods wasted in reimbursable meals by students in Group 3 schools. Observations were evenly spread over all meal periods and lines for breakfast and lunch. About 15 breakfasts and 40 lunches were tagged for observation. Field interviewers recorded foods served, the number of portions taken by the sampled student, and the amount of food left on each tagged tray.

Response Rates

Overall, SFAs and schools were very cooperative with weighted response rates for various data collection instruments ranging from 83 to 97 percent. Gaining cooperation from students and parents was more challenging, especially in schools that required active parental consent. Weighted response rates for students and parents ranged from 64 to 89 percent.

Data Processing Procedures

Processing the menu survey and dietary recall data involved coding the data into USDA's Survey Net system using standardized procedures to obtain energy and nutrient and food group data for each food reported on a menu or in a dietary recall. Survey Net (version 4.2) is linked to the Food and Nutrient Database for Dietary Studies (FNDDS, version 2011–2012) and provides food codes, descriptions, gram weights, and energy and nutrient composition for each food.

The assignment of prices to foods served in sample schools during the target week utilized food price documentation provided by SFAs and data on foods served from the Menu Survey. Separate procedures were used to assign prices to commercially purchased single food items, commercially purchased recipe ingredients, direct-delivered USDA Foods, and processed items containing USDA Foods.

For More Information

U.S. Department of Agriculture, Food and Nutrition Service, School Nutrition and Meal Cost Study: Study Design, Sampling, and Data collection, by Eric Zeidman et.al. Project Officer, John Endahl, Alexandria, VA: April 2019. Available online at: www.fns.usda.gov/research-and-analysis.

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