

**SCHOOL NUTRITION AND MEAL COST STUDY: VOLUME 4 – STUDENT PARTICIPATION, SATISFACTION, AND DIETARY INTAKES (SUMMARY)**

**Background**

The United States Department of Agriculture (USDA), Food and Nutrition Service’s (FNS) School Nutrition and Meal Cost Study (SNMCS) is the first nationally representative comprehensive assessment of the National School Lunch Program (NSLP) and School Breakfast Program (SBP) that simultaneously examines the cost of producing school meals and the nutritional quality of those meals, while also examining the contribution of school meals to the 24-hour dietary intake of students. The study addresses a broad array of research questions of interest to stakeholders at the national, State, and local levels.

Study findings are presented in four report volumes plus a summary report that highlights key findings across the volumes. Report Volume 4 provides information on student participation in and parent and student satisfaction with the school meals program, student dietary intakes, and plate waste during school year (SY) 2014-2015.

**Study Methods**

To address research questions associated with student participation, parent and student satisfaction, student dietary intakes, and plate waste, data were collected from a variety of sources:

- A Child/Youth Survey, including a 24-hour dietary recall on a target day, was administered to 2,165 students, and height and weight were measured by trained field staff. A subsample of 583 students completed a second 24-hour recall to estimate usual dietary intake.
- A Parent Interview was administered to 1,850 parents/guardians of sampled students.
- Administrative data were collected to determine participation status of sampled students. Participation is defined as receipt of a reimbursable lunch or breakfast on the target day referenced in a 24-hour recall.
- Plate waste observations were analyzed for 6,253 lunch trays observed in 165 schools and 3,601 trays from breakfast observed in 154 schools.

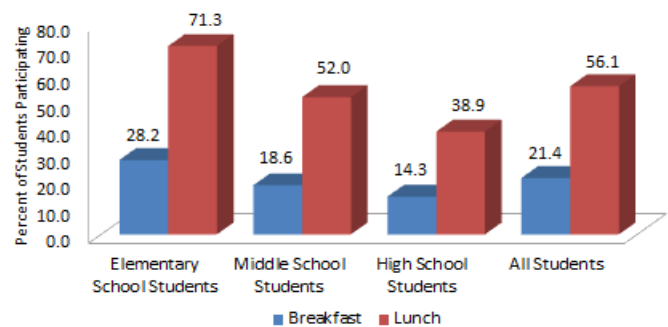
The primary focus of this report was to compare results obtained from NSLP and SBP participants with those of nonparticipants. A propensity score matching method (inverse probability matching) was used to construct comparison groups of nonparticipants that closely

resembled participants along a number of characteristics, such as gender, race/ethnicity, age, and family income.

**Study Findings**

*In SY 2014-2015, student participation in the NSLP was higher than in the SBP, and participation in both programs varied by school type and certain student characteristics.* NSLP participation rates were significantly higher in elementary schools (Figure 1) and among boys, Hispanic and non-Hispanic black students, students from lower income households, and students who were certified to receive free or reduced-price meals. Similar differences in SBP participation were observed, but were more pronounced.

**Figure 1. Average Target-Day Participation Rates in the School Breakfast Program and National School Lunch Program**



*There were higher rates of participation in schools with lunches of higher nutritional value.* The average NSLP participation rate for schools with lunches having high Healthy Eating Index (HEI)-2010 scores was 60 percent, compared with 50 percent for schools with lunches with low HEI-2010 scores.

*Students and parents alike most commonly cited hunger (35 percent of students and 17 percent of parents), liking the food (25 percent of students and 21 percent of parents), and convenience (14 percent of students and 24 percent of parents) as reasons for eating a school lunch.* The most frequently cited reason for nonparticipation was that the student preferred to eat a lunch from home (52 percent of students and 81 percent of parents). About 20 percent of students never eat a school lunch. Of this group, 40 percent reported that they don’t like school lunch/taste in general.

About 42 percent of students eat lunch occasionally (less than 3 times a week). Of those who occasionally eat lunch, 69 percent of their parents reported that their child does not like the food.

**Participating students and their parents were generally satisfied with school meals, with opinions about school breakfast somewhat more positive.** More than one-third (36 percent) of students who had ever eaten a school lunch reported that they liked the school lunch, while more than half (52 percent) reported that the school lunch was only okay. More than half (56 percent) of students who had ever eaten a school breakfast reported that they liked the school breakfast. Over 80 percent of parents of students who had ever eaten a school meal were very satisfied or somewhat satisfied with the school meals.

**With regard to food groups, NSLP participants were more likely than matched nonparticipants to consume milk, vegetables, fruit or 100 percent fruit juices, whole grain-rich bread products, and less likely to consume desserts, snack, and beverages other than milk or 100 percent fruit juice.** However, these differences generally did not persist over a student's 24-hour daily intake on the target day. There were no statistical differences in usual intakes of vegetables, fruits, grains, protein foods, oils, or empty calories but NSLP participants did have higher daily intakes of whole grains.

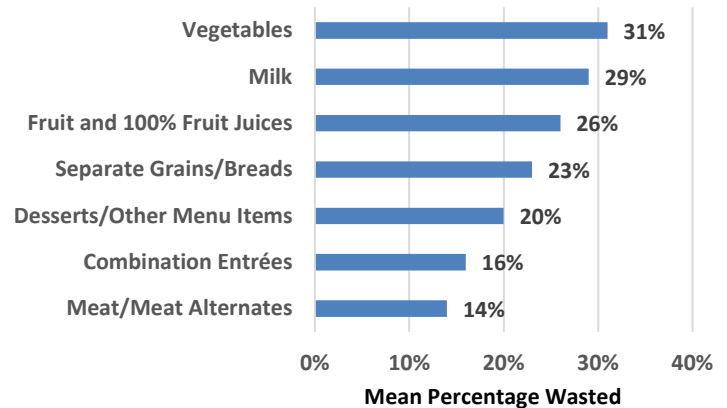
**Lunches consumed by NSLP participants were lower in calories, total fat, saturated fat, and sodium than lunches consumed by matched nonparticipants; as with food groups, however, these differences were not observed on students' intakes over 24 hours.** Lunches consumed by NSLP participants provided 128 fewer calories, on average, than lunches consumed by matched nonparticipants. However, total caloric intake for participants and nonparticipants over 24 hours was comparable (1,975 calories versus 1,980 calories).

**Plate waste was higher in elementary schools than in middle or high schools.** On average, more than one-quarter of the calories and nutrients available in elementary school lunches were wasted, while 12 to 15 percent of calories were wasted in middle and high schools.

**Plate waste at lunch across all school types varied by major food group (Figure 2).** Thirty-one percent of vegetables, 29 percent of milk, 26 percent of fruit and 100% fruit juice, and 23 percent of separate grains/breads were discarded from lunch trays. Plate waste was lower for combination entrées (16 percent) and meat/meat alternates (14 percent). Overall, plate waste at breakfast was highest for milk (41 percent), followed by fruits and 100% fruit juice (27 percent).

**The use of the offer-versus-serve (OVS) option was associated with significantly lower levels of plate waste among elementary schools.** Among elementary schools, the use of OVS at lunch was associated with significantly lower percentages of waste for calories (26 percent versus 32 percent) and fruits and vegetables (24 percent versus 35 percent).

**Figure 2. Types of Foods Wasted in National School Lunch Program (NSLP) Lunches**



**The majority of both NSLP participants and matched nonparticipants had acceptable usual daily intakes of macronutrients.** However, about 60 percent of NSLP participants and matched nonparticipants had usual daily intakes of saturated fat above the level recommended by the *Dietary Guidelines for Americans* and more than 81 percent had usual daily intakes of sodium above the tolerable upper intake level of the Dietary Reference Intakes.

**The consumption of NSLP lunches was associated with a higher quality daily diet, as measured by Healthy Eating Index (HEI)-2010 scores.** Overall, NSLP participants received a significantly higher total HEI-2010 score than matched nonparticipants (65.2 out of a possible 100 versus 60.6) based on a single 24-hour dietary recall. This difference is largely due to higher scores among NSLP participants for whole grains, dairy (Figure 3), and refined grains (data not shown).

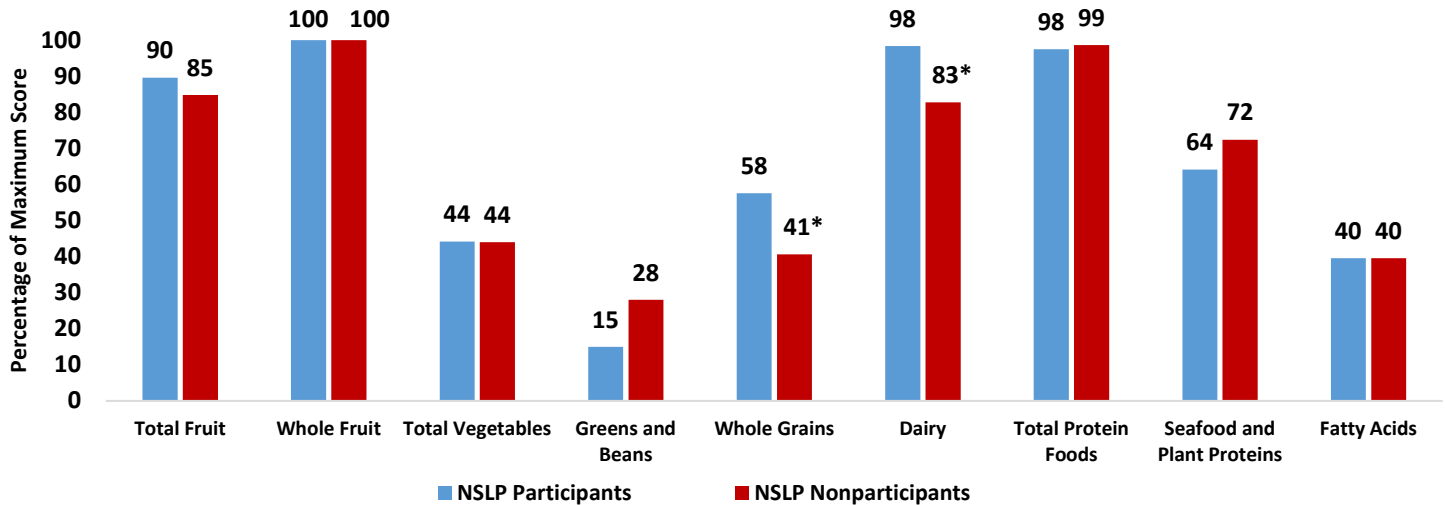
**Among students who did not participate in the SBP, more than 1 in 10 elementary and middle school students and more than 25 percent of high school students did not consume any type of breakfast.**

**Overall, NSLP participants were significantly more likely than matched nonparticipants to consume one or more competitive foods (29 percent versus 21 percent).** This pattern was observed for all three school types, but the difference was largely concentrated among high school students (43 percent versus 26 percent). These foods were typically found in cafeteria lines that sold both reimbursable meals and a la carte foods and beverages.

*Desserts, snacks, and other beverages were the most commonly consumed competitive foods for both NSLP participants and nonparticipants, but a significantly higher percentage of NSLP participants consumed these foods.* On average, both NSLP participants and matched

nonparticipants who consumed competitive foods obtained more than 150 calories from these foods.

**Figure 3. Healthy Eating Index-2010 Scores, as a Percentage of Maximum Scores, for National School Lunch Program (NSLP) Participants and Matched Nonparticipants: All Students**



\*Difference participants and nonparticipants is significantly different from zero at the 0.05 level.

### For More Information

U.S. Department of Agriculture, Food and Nutrition Service, School Nutrition and Meal Cost Study Final Report Volume 4: Student Participation, Satisfaction, and Dietary Intakes by Mary Kay Fox et.al. Project Officer, John Endahl, Alexandria, VA: April 2019. Available online at: [www.fns.usda.gov/research-and-analysis](http://www.fns.usda.gov/research-and-analysis).