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Department
of Agriculture
Food and Nutrition Service



School Nutrition Dietary Assessment Study-IV

Summary of Findings

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Office of Research and Analysis
Food and Nutrition Service, USDA
3101 Park Center Drive
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(703) 305-2017

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School Nutrition Dietary Assessment Study-IV

Summary of Findings

Mary Kay Fox and Elizabeth Condon
Mathematica Policy Research



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SNDA-IV findings are considered to be "influential scientific information" because they can have a substantial impact on important public policies or private sector decisions, as well as the potential to influence the actions of State and local agencies. FNS therefore conducted a formal peer review of the study's technical reports in compliance with the standards in the Office of Management and Budget Final Information and Quality Bulletin for Peer Review issued December 15, 2004.

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Overview



Overview of the Fourth School Nutrition Dietary Assessment Study (SNDA-IV)

The U.S. Department of Agriculture’s (USDA) Food and Nutrition Service (FNS) administers the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) to ensure that children do not go hungry and have access to nutritious meals and snacks that support normal growth and development. Since the early 1990s, FNS has sponsored the School Nutrition Dietary Assessment (SNDA) studies to provide up-to-date information on key characteristics of the school meal programs, the school environments in which the programs operate, the food and nutrient content of school meals and, in some studies, the contributions of school meals to students’ diets.

This report summarizes findings from the fourth SNDA study (SNDA-IV), which collected data from nationally representative samples of school districts and schools in school year (SY) 2009–2010. As in prior SNDA studies, the nutrient content of the average meals *offered* and *served* in the nation’s schools was compared with regulatory standards in effect at the time—the School Meals Initiative (SMI) nutrition standards—as well as selected recommendations included in the *Dietary Guidelines for Americans*. The study also collected information about the availability of competitive foods—foods sold in competition to USDA school meals through a

la carte sales in school cafeterias, vending machines, school stores, and other venues. Finally, the study collected data from a small, separate sample of elementary schools participating in the HealthierUS School Challenge (HUSSC) and compared findings for these schools to elementary schools nationwide.

Key findings in these core topic areas are summarized below. The rest of this report describes the SNDA-IV study in detail and summarizes major findings. It also describes selected changes observed in school meal programs over time. Most of these comparisons focus on changes between SYs 1998–1999 (SNDA-II), 2004–2005 (SNDA-III), and 2009–2010 (SNDA-IV). Nutrition standards for schools meals were the same throughout this period—the SMI standards—and FNS policy was intended to maintain or increase the proportion of schools that met these standards.

Key Findings About School Meals in SY 2009–2010

NSLP Lunches

Most schools *offered* and *served* NSLP lunches that, on average over a typical school week, met the SMI standards for minimum levels of target nutrients.

- Eighty-five percent or more of all schools *offered* average NSLP lunches that met or exceeded the standards for the SMI target nutrients—protein, vitamin A, vitamin C, calcium, and iron.
- With the exception of protein, fewer schools *served* average NSLP lunches that met the SMI standards for target nutrients. This is consistent with the fact that students do not necessarily take one serving of all foods offered to them. Still, the average NSLP lunch *served* in more than three-quarters of all schools met or came within 10 percent of the SMI standards for all target nutrients.
- For both NSLP lunches *offered* and *served*, elementary schools were consistently more likely than either middle or high schools to meet the SMI standards for most target nutrients.

Schools were less likely to offer and serve average NSLP lunches that met the SMI standard for minimum calories. This was especially true for middle and high schools.

- Almost two-thirds (65 percent) of all schools *offered* average NSLP lunches that met the minimum calorie level defined in the SMI standards and another 20 percent came within 10 percent of this standard. In contrast, 39 percent of all schools *served* average NSLP lunches that met the SMI minimum for calories and another 26 percent came within 10 percent of this standard.
- Middle and high schools were less likely than elementary schools to *offer* and *serve* NSLP lunches that met the SMI minimum for calories. Almost half (47 percent) of schools in both groups *offered* average NSLP lunches that met the SMI minimum standard for calories and 27 and 24 percent, respectively, *offered* average NSLP lunches that came within 10 percent of this standard. In contrast, 21 to 22 percent of middle and high schools *served* average NSLP lunches that satisfied the SMI minimum for calories and 23 and 16 percent of middle and high schools, respectively, *served* average NSLP lunches that came within 10 percent of the SMI minimum.
- The SMI standards define a minimum of 825 calories for grades 7 through 12. The average calorie content of NSLP lunches *served* in middle and high schools was 683 and 730, respectively. *Offering* and *serving* average NSLP lunches that are low in calories, relative to the SMI

standard, is not necessarily a negative outcome. Children obtain calories from other meals and snacks consumed both within and outside of school.

A majority of schools offered and served average NSLP lunches that were consistent with the SMI standard for total fat (no more than 30 percent of total calories from fat) or came within 10 percent of this standard.

- On average, 35 percent of all schools *offered* average NSLP lunches that were consistent with the SMI standard for total fat and an additional 25 percent of schools *offered* lunches that came within 10 percent of this standard (which is equivalent to 30.1 to 33.0 percent of total calories from fat).
- Results were comparable for the average NSLP lunch *served*. More than one-third (34 percent) of schools *served* NSLP lunches that were consistent with the SMI standard for total fat and an additional 29 percent of schools *served* lunches that came within 10 percent of this standard.
- Since SY 2004–2005, schools have made significant progress in meeting the SMI standard for total fat. Among elementary schools, the percentage of schools that *served* average NSLP lunches that met the SMI standard for total fat increased from 26 percent in SY 2004–2005 to 39 percent in SY 2009–2010. Among secondary schools, the percentage of schools meeting the SMI standard for total fat in average NSLP lunches *served* more than doubled—from 12 percent in SY 2004–2005 to 27 percent in SY 2009–2010.

More than three-quarters of all schools offered and served average NSLP lunches that were consistent with the SMI standard for saturated fat (less than 10 percent of total calories from saturated fat) or came within 10 percent of this standard.

- About half (51 percent) of all schools *offered* average NSLP lunches that were consistent with the SMI standard for saturated fat. An additional 28 percent of schools *offered* average NSLP lunches that came within 10 percent of this standard (which is equivalent to 10.0 to 10.9 percent of total calories from saturated fat).
- Results were comparable for the average NSLP lunch *served*. Half of all schools *served* average NSLP lunches that were consistent with the SMI standard for saturated

fat. An additional 26 percent of schools *served* average NSLP lunches that came within 10 percent of this standard.

- Since SY 2004–2005, schools have made significant progress in meeting the SMI standard for saturated fat. Among elementary schools, the percentage of schools that *served* average NSLP lunches that met the SMI standard for saturated fat increased from 34 percent in SY 2004–2005 to 53 percent in SY 2009–2010. Among secondary schools, the percentage of schools meeting the SMI standard for saturated fat in average NSLP lunches *served* almost doubled—from 24 percent in SY 2004–2005 to 46 percent in SY 2009–2010.

Few schools *offered* or *served* average NSLP lunches that met *all* of the SMI standards.

- Overall, 14 percent of schools *offered* NSLP lunches that met *all* of the SMI standards. The percentage of schools that *served* average NSLP lunches that met *all* of the SMI standards was 50 percent lower, at 7 percent. The SMI standards for calories, total fat, and saturated fat were the most challenging for schools to meet in NSLP lunches.

SBP Breakfasts

Most schools *offered* and *served* SBP breakfasts that, on average over a typical school week, were consistent with the SMI standards for target nutrients.

- For each of the SMI target nutrients (protein, vitamin A, vitamin C, calcium, and iron), 92 percent or more of all schools *offered* average SBP breakfasts that met the SMI standard.
- Fewer schools met the SMI standards for the average SBP breakfast *served*. This is consistent with the fact that students do not necessarily take one serving of all foods *offered* to them. Still, for each of the SMI target nutrients, the average SBP breakfast *served* in more than 80 percent of all schools met or came within 10 percent of the standard.
- Similar to the pattern observed for NSLP lunches, substantially fewer schools met the SMI standard for minimum calories than the SMI standards for minimum levels of target nutrients. However, unlike the pattern observed for NSLP lunches, there was relatively little difference in the findings for breakfasts *offered* and breakfasts *served*. In both cases, only about 20 percent of schools met the SMI standard for calories and about 20 percent more schools came within 10 percent of this standard.



- Almost all schools *offered* (93 percent) and *served* (85 percent) SBP breakfasts that, on average, met the SMI standard for total fat (no more than 30 percent of total calories from fat).
- More than three-quarters of all schools *offered* and *served* average SBP breakfasts that met the SMI standard for saturated fat (less than 10 percent of total calories from saturated fat). An additional 11 to 13 percent of schools *offered* and *served* SBP breakfasts that came within 10 percent of this standard (which is equivalent to 10.0 to 10.9 percent of total calories from saturated fat).

Few schools *offered* or *served* average SBP breakfasts that met *all* of the SMI standards.

- Overall, 15 percent of schools *offered* average SBP breakfasts that met *all* of the SMI standards and 11 percent of schools *served* average SBP breakfasts that met *all* of the SMI standards. The SMI standard that was the most challenging for schools to meet in SBP breakfasts was the standard for minimum calories.

Key Findings About Competitive Foods in SY 2009–2010

Competitive foods were widely available in schools, particularly in secondary schools.

- Eighty-two percent of elementary schools, 95 percent of middle schools, and 90 percent of high schools had a la carte offerings available at lunch. Smaller percentages of schools (58, 74, and 70 percent, respectively) had a la carte offerings available at breakfast.
- Vending machines were widely available in high schools (85 percent), somewhat less common in middle schools (67 percent), and rare in elementary schools (13 percent).

The vast majority of school districts had some type of ban or restriction on the availability of sweetened beverages and snack foods.

- More than 80 percent of school districts had a ban or restriction related to sweetened beverages and more than 75 percent had a ban or restriction related to snack foods.¹ These bans or restrictions were most commonly implemented on a district-wide basis rather than in specific schools or types of schools.

Key Findings About HUSSC Elementary Schools in SY 2009–2010

Compared with elementary schools nationwide, larger proportions of HUSSC elementary schools met most SMI standards for both NSLP lunches *offered* and *served*.

- For both NSLP lunches *offered* and *served*, a larger share of HUSSC elementary schools met the SMI standards for calories, vitamin C, and iron, on average, than elementary schools nationwide. This was also true for vitamin A in lunches *served*.
- For both NSLP lunches *offered* and *served*, a larger share of HUSSC elementary schools met SMI standards for total fat and saturated fat, on average, than elementary schools nationwide.
- HUSSC elementary schools did a better job than elementary schools overall in *offering* average NSLP lunches that met *all* of the SMI standards. Forty percent of HUSSC elementary schools *offered* average NSLP lunches that met *all* of the SMI standards, compared with 17 percent of all elementary schools nationwide. A comparable pattern was noted for the average NSLP lunch *served*. However, few elementary schools in either group *served* average NSLP lunches that met *all* of the SMI standards (14 percent of HUSSC elementary schools and 9 percent of elementary schools overall).

Compared with elementary schools nationwide, HUSSC elementary schools offered raw vegetables and fresh fruit more frequently.

- Raw vegetables were offered in 63 percent of daily lunch menus in HUSSC elementary schools, compared with 57 percent of daily lunch menus in elementary schools nationwide.
- More than 8 out of 10 lunch menus in HUSSC elementary schools (82 percent) included fresh fruit, compared with just over half (56 percent) of lunch menus in elementary schools nationwide.

Section I



Background

The school meal programs are administered by the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS). The National School Lunch Program (NSLP) is the second largest of 15 nutrition assistance programs administered by FNS. Created 65 years ago, the program operates in virtually all public schools and 94 percent of all schools (public and private combined) in the United States.² In fiscal year (FY) 2010, the program served lunches to 31.7 million children on an average school day.³ Almost two-thirds (65 percent) of these lunches were served free or at a reduced price to children from low-income households. Since 1998, schools participating in the NSLP have had the option of providing snacks to children in eligible afterschool programs. In FY 2010, 1.3 million afterschool snacks were served on an average school day.

The School Breakfast Program (SBP) began as a pilot program in 1966 and was made permanent in 1975. Over the years, the program has steadily expanded. In school year (SY) 2009–2010, the SBP was available in 89 percent of public schools that operated the NSLP. In FY 2010, the program served 11.7 million children on an average school day. The SBP primarily serves children from low-income households—in FY 2010, 84 percent of SBP meals were served free or at a reduced price.

Since the 1980s, FNS has assessed the school meal programs on a periodic basis. The School Nutrition Dietary Assessment (SNDA) studies began in the early 1990s and findings from these studies have provided policymakers with useful information that has fueled important program improvements. For example SNDA-I, completed in SY 1991–1992, found that levels of fat, saturated fat, and sodium in school lunches were not consistent with the *Dietary Guidelines for Americans*.⁴ In response, USDA launched the School Meals Initiative for Healthy Children (SMI), a multifaceted initiative that established new nutrition standards for school meals, revised the approaches used to plan school menus, and provided training and technical assistance for school foodservice operators. Most recently, the Institute of Medicine (IOM), at USDA's request, used data from SNDA-III to help develop recommendations for updating the nutrient- and food-based requirements that govern school meals.⁵

This report summarizes findings from the fourth SNDA study (SNDA-IV), which is based on data collected in the second half of SY 2009–2010 and builds on the methods used in the three previous SNDA studies.

Research Questions

SNDA-IV addressed a broad array of issues of interest to stakeholders at the Federal, State, and local levels. Study research questions can be grouped into three basic categories:

1. What are the characteristics of schools and School Food Authorities (SFAs)⁶ participating in the NSLP and SBP, particularly as they relate to meal service operations and school food and physical activity environments?
2. What are the characteristics of NSLP lunches and SBP breakfasts *offered* and *served* to students?
3. How have characteristics of the meals *offered* and *served* to students, as well as the characteristics of school foodservice programs and school food environments, changed over time?

SNDA-IV also included an assessment of the food and nutrient content of afterschool snacks provided through the NSLP and a small, separate substudy of elementary schools that participate in USDA's HealthierUS School Challenge (HUSCC) initiative.

Data

SNDA-IV data are representative of all public SFAs and schools that offer the NSLP in the 48 contiguous States and the District of Columbia. Data were collected from January through June 2010. SFA directors completed a brief web-based survey that collected data on SFA-level policies and practices related to menu planning, a la carte foods, food purchasing, food safety and sanitation, nutrition promotion, and school wellness policies. School foodservice managers (FSMs) completed a detailed menu survey that collected information about all of the foods and beverages offered in school meals and afterschool snacks during a selected week, including detailed food descriptions, portion sizes, and, for breakfasts and lunches, the number of servings provided in reimbursable meals. FSMs also completed a brief survey that collected information about the characteristics of school kitchens, availability of vending machines in foodservice areas, meal pricing, scheduling of meal periods, nutrition promotion activities, and other operational issues. Principals completed a brief web-based survey that collected information on mealtime policies; activities scheduled during meal-times; availability of vending machines, school stores and snack bars; requirements for nutrition education and physical education; opportunities for physical activity during the school day; and school wellness policies. Finally, an individual designated by the principal provided information about the availability of competitive foods in vending machines, school stores, and other venues. Data were collected from 578 public SFAs and up to 895 schools (completed sample sizes vary by data collection instrument).

Section II



Program Operations

The school meal programs operate under Federal regulations and policies that are generally designed and implemented by FNS. Within these parameters, local SFAs and schools have considerable discretion in how they operate their programs. FNS makes technical assistance and guidance materials available to all SFAs, who also receive training, technical assistance, and monitoring from State Child Nutrition agencies. The SNDA studies provide policymakers with an opportunity to assess local program operations on a periodic basis. These assessments provide updated information about a broad range of topics, including programs offered by schools, student participation rates, meal prices, menu planning and meal production practices, and food safety and sanitation.

Programs Offered

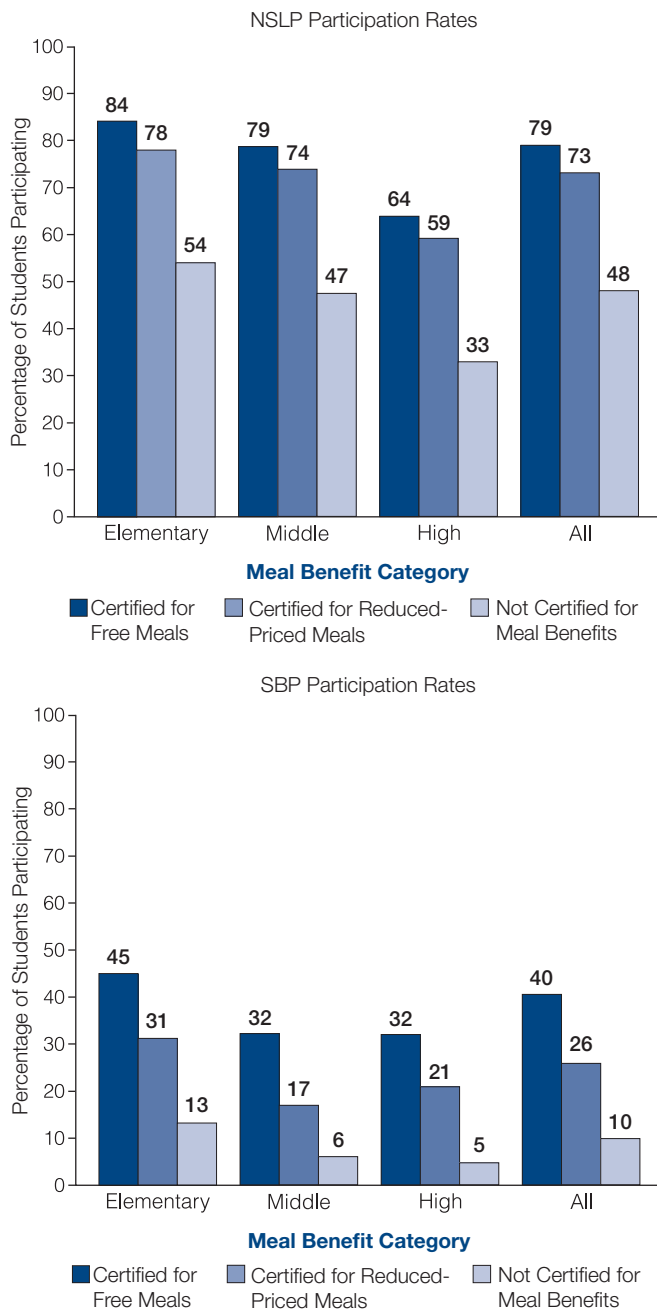
- In SY 2009–2010, most public schools that participated in the NSLP (89 percent) also participated in the SBP.
- More than one quarter (27 percent) of public NSLP schools provided reimbursable afterschool snacks. Elementary schools were more likely to provide afterschool snacks than either middle or high schools (33 versus 23 and 13 percent, respectively).

Student Participation

- On an average day in SY 2009–2010, 63 percent of all students in public NSLP schools participated in the program. Participation varied by type of school and was highest in elementary schools and lowest in high schools (Figure 1). In addition, students certified to receive free or reduced-price lunches participated at higher rates than students not certified to receive meal benefits.
- Overall rates of student participation were notably lower for the SBP than the NSLP. On an average day in SY 2009–2010, 28 percent of all students in schools that participated in the SBP participated in the program. General patterns of SBP participation were similar to those observed for the NSLP; however, the magnitude of the differences between subgroups of students was larger (Figure 1). For example, for the SBP, the rate of participation among students certified to receive free meals was four times higher than the rate of participation among students not certified to receive meal benefits (40 percent versus 10 percent), compared to a 65 percent difference for NSLP participation (79 percent versus 48 percent).

Figure 1.

Low-Income and Elementary Students Participate in the NSLP and SBP at Higher Rates than Other Students



NSLP = National School Lunch Program; SBP = School Breakfast Program.

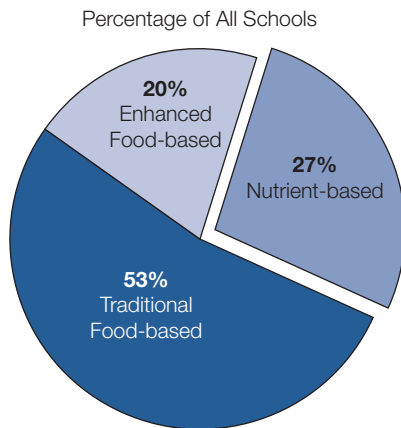
Source: School Nutrition Dietary Assessment Study-IV, Menu Survey, Recruitment Interview and Principal Survey (see Volume I, Table 2.2).

Meal Prices

- The average prices charged for reduced-price meals in SY 2009–2010 were \$0.39 for lunch and \$0.30 for breakfast. By law, SFAs may charge no more than \$0.40 for a reduced-price lunch and no more than \$0.30 for a reduced-price breakfast.
- The average price charged for a paid lunch in SY 2009–2010 was \$1.93. This represents a 21 percent increase from the average price for a paid lunch in SY 2004–2005 (\$1.60).⁷
- The average price charged for a paid breakfast in SY 2009–2010 was \$1.13. This represents a 28 percent increase from the average price for a paid breakfast in SY 2004–2005 (\$0.88).⁸
- The Healthy, Hunger-Free Kids Act of 2010 (HHFKA) (P.L. 111-296) required schools to gradually increase the price charged for full-price meals (with annual increases of no more than \$0.10) until the revenue per meal matches the per-meal Federal reimbursement for free meals.⁹ Previous research has shown that student participation may be affected by meal prices¹⁰, so some stakeholders have raised concerns that this requirement might affect participation. To explore this issue, SNDA-IV assessed the price elasticity of paid meal participation. Price elasticity is a measure of the responsiveness, or elasticity, of the demand for a good or service to a change in price. Findings showed that, overall, a 10 percent increase in the price of a paid lunch was associated with a decline of 1.5 percentage points in the rate of paid lunch participation. A 10 percent increase in the price of a paid breakfast was associated with a decline of 0.5 percentage points in the rate of paid breakfast participation.

Figure 2.

Most Schools Used Food-Based Menu Planning in SY 2009–2010



Note: The percentage for nutrient-based menu planning includes nutrient standard menu planning (NSMP) and assisted nutrient standard menu planning (ANSMP).

SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, School Food Authority Director Survey (see Volume I, Figure 2.1).

Menu Planning Systems

■ In SY 2009–2010, SFAs could choose from five different systems for planning menus. Two systems were food-based (traditional and enhanced) and two were nutrient-based (nutrient standard menu planning [NSMP] and assisted NSMP [ANSMP]). A fifth option allowed SFAs to use other reasonable approaches, which typically varied only slightly from the four main systems and required State approval. More than 7 of 10 schools (73 percent) used food-based menu planning (Figure 2). More than half of all schools (53 percent) used traditional food-based menu planning and another 20 percent used enhanced food-based menu planning. About one-quarter of all schools (27 percent) used nutrient-based menu planning.



Meal Production and Service

- Most schools (80 percent) prepared food on site and almost three-fourths (72 percent) prepared meals for their school only.
- About one in five SFAs (19 percent) used a foodservice management company (FSMC) to run all or part of their school meal programs. Use of FSMCs was more common in medium-sized districts, districts with low levels of child poverty, and urban and suburban districts.
- The offer-versus-serve (OVS) option, which allows students to refuse a certain number of items offered in a reimbursable meal, is mandatory for high schools but optional for elementary and middle schools. Most elementary and middle schools used OVS for all students at both lunch (69 and 77 percent, respectively) and breakfast (73 and 82 percent, respectively).



Food Safety and Sanitation

- In SY 2009–2010, directors in 91 percent of SFAs reported that all of their schools had the food safety plan required by USDA. Most SFAs reported that all of the required components were present.
- About two-thirds (67 percent) of SFA directors reported that food safety certification is required for at least some foodservice personnel.

Section III



Characteristics of School Meals and Afterschool Snacks

To be eligible for Federal reimbursement, meals *offered* and *served* in the NSLP and SBP (see box) must meet defined nutrition standards. The nutrition standards in place during SY 2009–2010 were implemented in 1995 as part of the SMI. The SMI standards, which are based on the 1989 Recommended Dietary Allowances (RDAs) and the 1995 *Dietary Guidelines*, required that lunches provide 33 percent of the RDAs for calories, protein, vitamins A and C, calcium, and

iron, and that breakfasts provide 25 percent of the RDAs (Table 1). The SMI standards also required that both lunches and breakfasts provide no more than 30 percent of calories from fat and less than 10 percent of calories from saturated fat. Finally, the SMI standards encouraged reduced levels of sodium and cholesterol in school meals and increased amounts of fiber, but did not set quantitative targets for these dietary components.

Meals Offered and Meals Served

Estimates of the **average meal offered** assume that students take one serving of each type of food (meal component) offered to them, for example, one milk, one entree, one fruit, and one vegetable. Choices within a meal component group (for example, three different types of milk) are averaged and then the average calories and nutrients in each meal component group are summed.

Estimates of the **average meal served** incorporate information about students' food selection patterns—that is, information about the number and types of foods included in the meals that are actually served to or selected by students. Instead of a simple average of all foods offered, estimates of the average meal served give greater weight to the calorie and nutrient content of the foods and beverages students select more frequently.

Nutrition standards for school meals were recently revised to reflect the most current nutrition guidance provided by the *Dietary Guidelines*, as well as updated information about nutrient requirements included in the Dietary Reference Intakes (DRIs), which replaced the 1989 RDAs.¹¹ The revised standards are based on recommendations included in the IOM report “School Meals: Building Blocks for Healthy Children.”¹² The IOM recommendations, which were designed to increase alignment of school meals with the *Dietary Guidelines*, called for increasing fruits, vegetables, and whole grains in school meals; limiting milk to fat-free or low-fat varieties; substantially reducing the sodium content of school meals over time; controlling saturated fat and calorie levels; and eliminating trans fat while satisfying children’s nutrient requirements. The final rule, issued in January 2012, requires that schools begin implementing the new requirements in SY 2012–2013.¹³

Standards Used to Assess the Calorie and Nutrient Content of School Meals

To assess the calorie and nutrient content of school meals offered and served in SY 2009–2010, SNDA-IV used the SMI standards rather than the new requirements because the SMI standards were in place at the time data were collected. To provide additional insights about nutritional quality, meals offered and served were also compared with 2010 *Dietary Guidelines* recommendations for total fat, sodium, cholesterol, and dietary fiber (Table 1).

To simplify the discussion, the term standard is used to refer to all of the benchmarks used in assessing schools meals. It is important to note, however, that, in SY 2009–2010, schools were not required to meet the standards based on 2010 *Dietary Guidelines* recommendations. Analyses assessed the percentage of schools that offered and served meals that, on

Table 1.
Standards Used in Evaluating the Nutrient Content of School Meals

Nutrient	Lunch Standard	Breakfast Standard
SMI Standards		
Based on 1989 <i>Recommended Dietary Allowances</i> ¹⁴		
Calories	One-third of the REA	One-fourth of the REA
Protein, Vitamins A and C, Calcium, and Iron	One-third of the RDAs	One-fourth of the RDAs
Based on 1995 <i>Dietary Guidelines for Americans</i> ¹⁵		
Total Fat	No more than 30 percent of total calories	
Saturated Fat	Less than 10 percent of total calories	
Standards Based on the 2010 <i>Dietary Guidelines for Americans</i>¹⁶		
Total Fat	25 to 35 percent of total calories	
Cholesterol	Less than 100 mg	Less than 75 mg
Sodium	Less than 767 mg	Less than 575 mg
Dietary Fiber	14 g per 1,000 calories	

Notes: Schools were not required to meet standards based on the 2010 *Dietary Guidelines*.

Standards for cholesterol are based on one-third (lunch) and one-fourth (breakfast) of the suggested maximum daily intake of less than 300 mg.

Standards for sodium are based on one-third (lunch) and one-fourth (breakfast) of the suggested maximum daily intake of less than 2,300 mg.

RDAs = Recommended Dietary Allowances; REA = Recommended Energy Allowance; SMI = School Meals Initiative for Healthy Children.

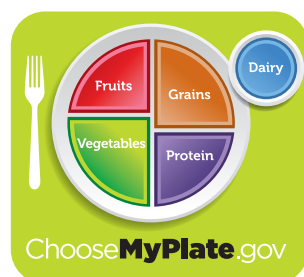
average, satisfied each of the individual standards, as well as the percentage that *offered* and *served* meals that came within 10 percent of each standard. Information about the size of the disparity in nutrient content among schools that did not meet a particular standard can be useful to program administrators in identifying targets for training and technical assistance to support school foodservice personnel in planning meals that do meet the standards.

Potential Contribution of School Meals to Recommended USDA Food Patterns

The USDA Food Patterns translate the *Dietary Guidelines* into food patterns that describe the types and amounts of foods included in a diet that is consistent with 2010 *Dietary Guidelines* recommendations. A healthful food pattern focuses on nutrient-dense foods, such as vegetables, fruits, whole grains, fat-free or low-fat dairy products, and lean protein foods, which are prepared without added solid fats, sugars, starches, or sodium and, when combined, stay within recommended calorie limits. To fully assess the nutritional quality of school meals, it is important to examine their potential contribution to healthful dietary patterns. Previous rounds of the SNDA studies have not addressed this question, so findings from this assessment make an important contribution to the knowledge base on the nutritional quality of school meals.

The USDA Food Patterns identify average daily amounts of foods, in nutrient-dense forms, to eat from five major food groups:

1. Vegetables
2. Fruits
3. Grains
4. Dairy
5. Protein Foods



The Food Patterns are designed to meet nutrient needs while not exceeding calorie requirements. Food Pattern recommendations for individuals depend on calorie requirements, which are determined by age, gender, and activity level. The system includes 12 different Food Patterns, ranging from 1,000 to 3,200 calories.

To assess the potential contribution of school meals to USDA Food Pattern recommendations, the food group content of aver-

age meals *offered* and *served* in elementary, middle, and high schools was compared with Food Patterns for 1,800, 2,000, and 2,400 calories, respectively. These are the calorie levels used by the IOM in developing recommendations for revised nutrition standards for school meals.¹⁷ To provide additional context, the benchmarks used in the SMI nutrition standards—33 percent for NSLP lunches and 25 percent for SBP breakfasts—were applied in assessing food group content. Thus, if the SMI benchmarks were applied to the USDA Food Patterns, the expectation would be that NSLP lunches and SBP breakfasts would provide one-third and one-fourth, respectively, of the recommended average daily amounts of food groups.

Lunches Offered and Served in Public NSLP Schools

Calorie and Nutrient Content of Average NSLP Lunches

Most schools *offered* and *served* NSLP lunches that, on average over a typical school week, met the SMI standards for minimum levels of target nutrients (Figure 3).

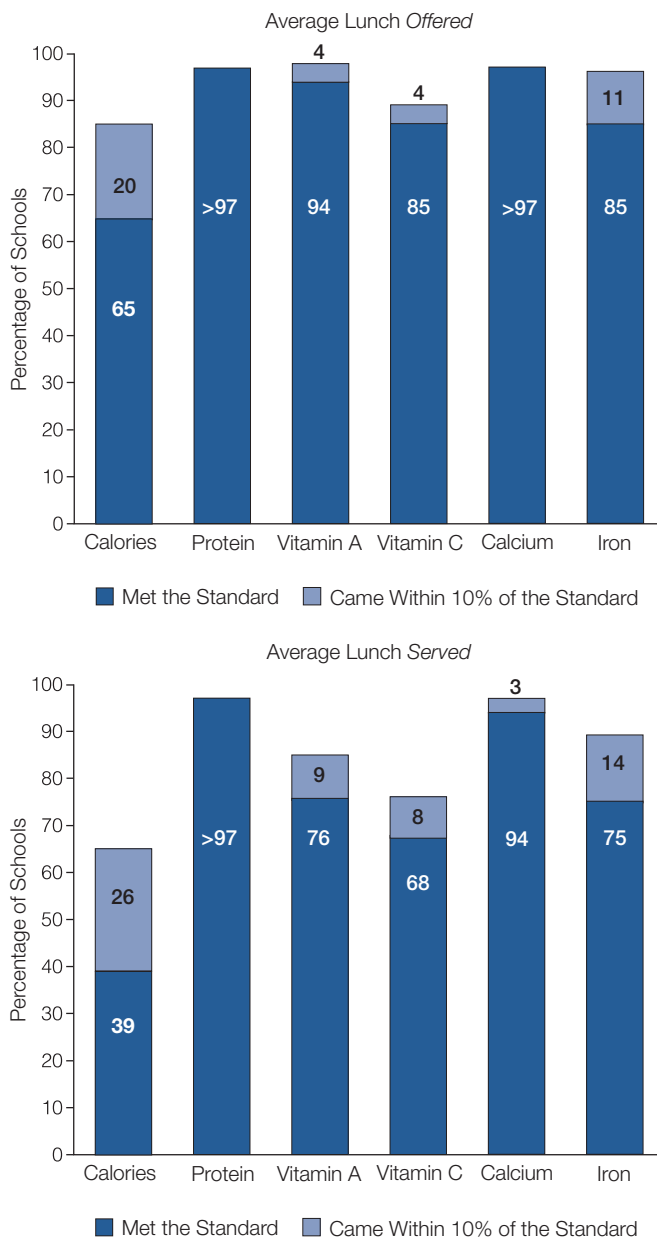
- Eighty-five percent or more of all schools *offered* average NSLP lunches that met or exceeded the standards for the SMI target nutrients—protein, vitamin A, vitamin C, calcium, and iron.
- With the exception of protein, fewer schools *served* average NSLP lunches that met the SMI standards for target nutrients. This is consistent with the fact that students do not necessarily take one serving of all foods offered to them. Still, the average NSLP lunch *served* in more than three-quarters of all schools met or came within 10 percent of the SMI standards for all target nutrients.
- For both NSLP lunches *offered* and *served*, elementary schools were consistently more likely than either middle or high schools to meet the SMI standards for most target nutrients.

Schools were less likely to *offer* and *serve* average NSLP lunches that met the SMI standard for minimum calories. This was especially true for middle and high schools (Figure 3).

- Almost two-thirds (65 percent) of all schools *offered* average NSLP lunches that met the minimum calorie level defined in the SMI standards and another 20 percent came

Figure 3.

Most Schools Offered and Served NSLP Lunches that Met or Came Within 10 Percent of the SMI Standards for Calories and Target Nutrients



Note: >97 is displayed for percentages between 97 and 100 when the point estimate is considered less precise because of a large coefficient of variation. NSLP = National School Lunch Program; SMI = School Meals Initiative for Healthy Children.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Tables E.3, E.4, E.7, and E.8).

within 10 percent of this standard. In contrast, 39 percent of all schools *served* average NSLP lunches that met the SMI minimum for calories and another 26 percent came within 10 percent of this standard.

- Middle and high schools were less likely than elementary schools to *offer* and *serve* NSLP lunches that met the SMI minimum for calories. Almost half (47 percent) of schools in both groups *offered* average NSLP lunches that met the SMI minimum standard for calories and 27 percent and 24 percent, respectively, *offered* average NSLP lunches that came within 10 percent of this standard. In contrast, 21 to 22 percent of middle and high schools *served* average NSLP lunches that satisfied the SMI minimum for calories and 23 and 16 percent of middle and high schools, respectively, *served* average NSLP lunches that came within 10 percent of the SMI minimum.
- The SMI standards define a minimum of 825 calories for grades 7 through 12. The average calorie content of NSLP lunches *served* in middle and high schools was 683 and 730, respectively. Offering and serving average NSLP lunches that are low in calories, relative to the SMI standard, is not necessarily a negative outcome. Children obtain calories from other meals and snacks consumed both within and outside of school.

A majority of schools offered and served average NSLP lunches that either met the SMI standard for total fat (no more than 30 percent of total calories from fat) or came within 10 percent of this standard (Figure 4).

- On average, 35 percent of all schools *offered* average NSLP lunches that were consistent with the SMI standard for total fat and an additional 25 percent of schools *offered* lunches that came within 10 percent of this standard (which is equivalent to 30.1 to 33.0 percent of total calories from fat).
- Results were comparable for the average NSLP lunch *served*. More than one-third (34 percent) of schools *served* NSLP lunches that were consistent with the SMI standard for total fat and an additional 29 percent of schools *served* lunches that came within 10 percent of this standard.

Schools were more likely to meet the 2010 Dietary Guidelines recommendation for total fat than the corresponding SMI standard (Figure 4).

- The 2010 *Dietary Guidelines* recommendation for total fat is less restrictive than the SMI standard (25 to 35 percent of calories from total fat versus no more than 30 percent [see Table 1]). Almost three-quarters of all schools *offered* and *served* NSLP lunches that met the 2010 *Dietary Guidelines* recommendation for fat (70 and 72 percent, respectively) and about 20 percent of schools *offered* and *served* NSLP lunches that came within 10 percent of this standard.

More than three-quarters of all schools *offered* and *served* average NSLP lunches that met the SMI standard for saturated fat (less than 10 percent of total calories from saturated fat) or came within 10 percent of this standard (Figure 4).

- About half, (51 percent) of all schools *offered* average NSLP lunches that were consistent with the SMI standard for saturated fat. An additional 28 percent of schools *offered* average NSLP lunches that came within 10 percent of this standard (which is equivalent to 10.0 to 10.9 percent of total calories from saturated fat).
- Results were comparable for the average NSLP lunch *served*. Half of all schools *served* NSLP lunches that were consistent with the SMI standard for saturated fat. An additional 26 percent of schools *served* average NSLP lunches that came within 10 percent of this standard.

Few schools *offered* or *served* average NSLP lunches that met *all* of the SMI standards.

- Overall, 14 percent of schools *offered* NSLP lunches that met *all* of the SMI standards. The percentage of schools that *served* average NSLP lunches that met *all* of the SMI standards was 50 percent lower, at 7 percent. As discussed above and shown in Figures 3 and 4, the SMI standards for calories, total fat, and saturated fat were the most challenging for schools to meet in NSLP lunches.

Essentially all schools *offered* and *served* average NSLP lunches that met the 2010 *Dietary Guidelines* recommendation for cholesterol, but very few schools *offered* and *served* lunches that were consistent with 2010 *Dietary Guidelines* recommendations for sodium and fiber.

- The mean sodium content of lunches *offered* and *served* in more than three-quarters of all schools exceeded the 2010 *Dietary Guidelines* recommendation for sodium by more than 50 percent. Excess sodium is not unique to school

Figure 4.

Schools Were More Likely to Offer and Serve NSLP Lunches that Met the SMI Standard for Saturated Fat and the 2010 *Dietary Guidelines* Recommendation for Total Fat than the SMI Standard for Total Fat



Note: The standard for saturated fat is the same for the SMI and 2010 *Dietary Guidelines*.

NSLP = National School Lunch Program; SMI = School Meals Initiative for Health Children.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Tables E.4 and E.8).

meals; virtually all Americans consume more sodium than they need. Most sodium comes from processed foods and achieving recommended levels of sodium will require a deliberate reduction in the sodium content of foods available in the marketplace.¹⁸

- Only 4 percent of schools *offered* average NSLP lunches that met the 2010 *Dietary Guidelines* recommendation for dietary fiber and another 8 percent came within 10 percent of meeting the recommendation. The average dietary fiber content of NSLP lunches *offered* in most schools (62 percent) was more than 25 percent below the *Dietary Guidelines* recommendation. Dietary fiber content was even lower in average NSLP lunches *served*.

Trends in the Nutrient Content of Average NSLP Lunches Since SY 1998–1999¹⁹

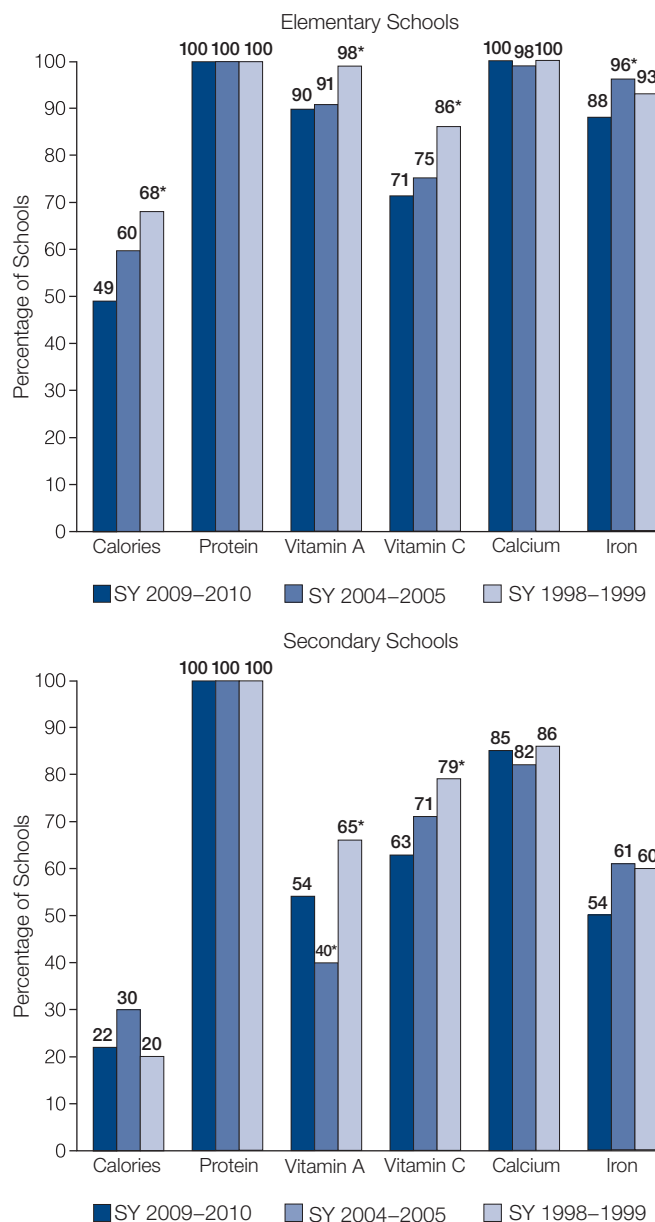
Three SNDA studies have been conducted since the SMI was enacted—SNDA-II in SY 1998–1999; SNDA-III in SY 2004–2005; and the present study, SNDA-IV, in SY 2009–2010. Nutrition standards for schools meals were the same throughout this period—the SMI standards—and FNS policy was intended to maintain or increase the proportion of schools that met these standards. Thus, it is useful to understand how characteristics of school meals have changed over this period. Comparisons focus on estimates of lunches as *served* and present data for elementary and secondary schools (middle and high schools combined) because these are the breakdowns used in previous published comparisons of data from the SNDA studies.

Percentage of Schools Meeting SMI Standards for Calories and Target Nutrients (Figure 5)

- There were no statistically significant differences in the proportions of elementary or secondary schools *servicing* NSLP lunches that satisfied the SMI standard for calories between SYs 2004–2005 and 2009–2010.
- However, between SYs 1998–1999 and 2009–2010, there was a significant drop in the proportion of elementary schools *servicing* NSLP lunches that met the SMI standard for calories (68 versus 49 percent). A parallel drop was not observed among secondary schools.
- At all three points in time, secondary schools were considerably less likely than elementary schools to *serve* lunches that met the SMI standard for calories.

Figure 5.

In SYs 2009–2010 and 2004–2005, Similar Proportions of Schools Served NSLP Lunches that Met SMI Standards for Calories and Most Target Nutrients



*Proportion is significantly different from SY 2009–2010 at the .05 level.

NSLP = National School Lunch Program; SMI = School Meals Initiative for Healthy Children; SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 11.1) and School Nutrition Dietary Assessment Studies-III and -II, Menu Surveys.

- Compared with SY 2004–2005, NSLP lunches served in SY 2009–2010 in both elementary and secondary schools were generally as likely to satisfy the SMI standards for most target nutrients.
- Between SYs 1998–1999 and 2009–2010, there was a significant drop in the proportion of elementary schools serving lunches that met the SMI standards for vitamins A and C and iron. The proportion of secondary schools meeting the SMI standards for vitamins A and C also decreased significantly over this period. At both points in time, most schools met the relevant standards; however, the proportions were notably lower for secondary schools.

Percentage of Schools Meeting SMI Standards for Total Fat and Saturated Fat (Figure 6)

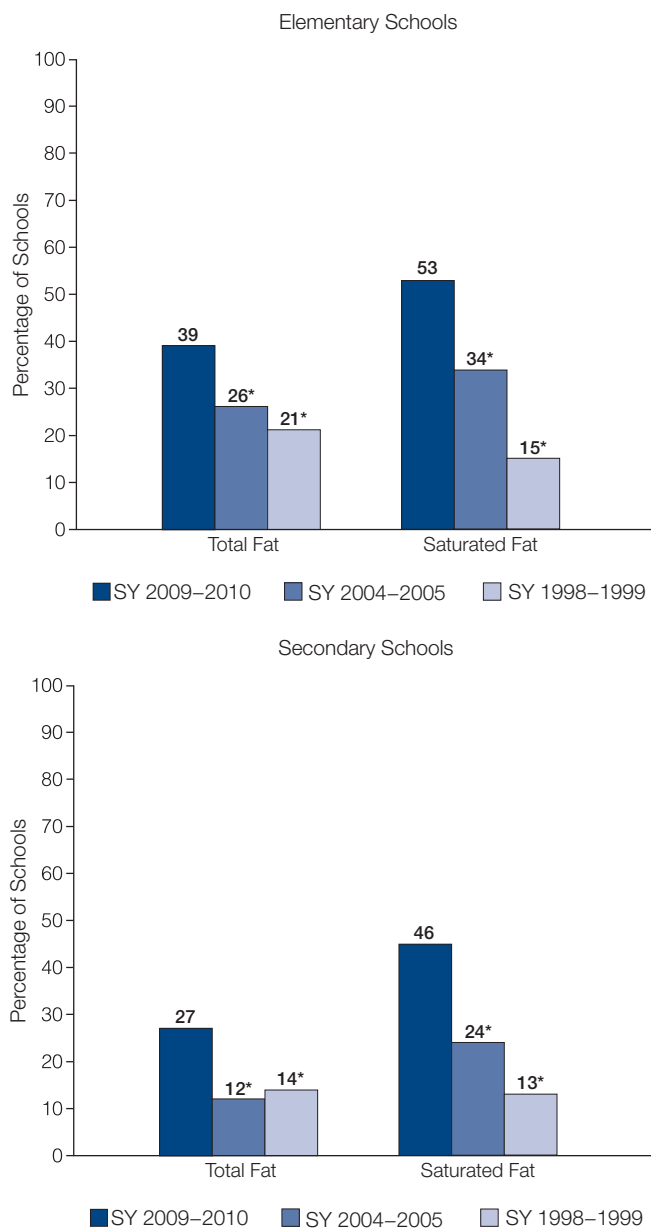
- Both elementary and secondary schools have made steady progress in meeting the SMI standards for total fat since SY 1998–1999. Both types of schools were significantly more likely to serve an average NSLP lunch that met the SMI standard for the percentage of calories from fat in SY 2009–2010 than in SY 2004–2005 or SY 1998–1999.
- Between SYs 2004–2005 and 2009–2010, the proportion of schools meeting the SMI standard for total fat increased by 50 percent among elementary schools (from 26 to 39 percent) and more than doubled among secondary schools (from 12 to 27 percent).
- More than half (53 percent) of elementary schools and nearly half (46 percent) of secondary schools met the SMI standard for saturated fat in SY 2009–2010. This marks an increase of about 20 percentage points since SY 2004–2005 in the proportion of elementary and secondary schools that met the saturated fat standard.

Percentage of Schools Meeting Other Standards and Recommendations

- Between SY 2004–2005 and SY 2009–2010, there was no change in the percentage of schools that served average NSLP lunches that met all of the SMI standards. At both points in time, about 7 percent of all schools served such lunches.
- As noted previously, schools were not required to serve NSLP lunches that met specific quantitative standards for cholesterol or sodium, but were encouraged to keep lev-

Figure 6.

The Percentage of Schools Serving NSLP Lunches that Met SMI Standards for Total Fat and Saturated Fat Has Increased Significantly Since SYs 2004–2005 and 1998–1999



Note: The SMI standard for total fat is no more than 30 percent of calories from fat and the SMI standard for saturated fat is less than 10 percent of calories from saturated fat.

* Proportion is significantly different from SY 2009–2010 at the .05 level.

NSLP = National School Lunch Program; SMI = School Meals Initiative for Healthy Children; SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 11.2) and School Nutrition Dietary Assessment Studies-III and -II, Menu Surveys.

els of these dietary components low in planned menus. The average amount of cholesterol in lunches *served* at all three points in time was well below the benchmark of no more than 100 mg.

- Schools have not made notable progress toward meeting the sodium target over time. At all three points in time, less than 10 percent of elementary or secondary schools *served* lunches with an average sodium content that was within 200 mg of the recommended maximum.

Availability of Lunches that Met Standards

In schools where the average NSLP lunch *offered* was not consistent with a particular standard, students might have had the opportunity to select a meal that did meet the standard. For example, provided that lower-fat menu choices were available, it is possible that individual students could have selected lunches consistent with the SMI standards for total fat and/or saturated fat. SNDA-IV assessed the availability of lunches that met the standards that were the most challenging for schools to meet. This included the SMI standards for total fat, saturated fat, and iron, and the 2010 *Dietary Guidelines* recommendations for sodium and dietary fiber.

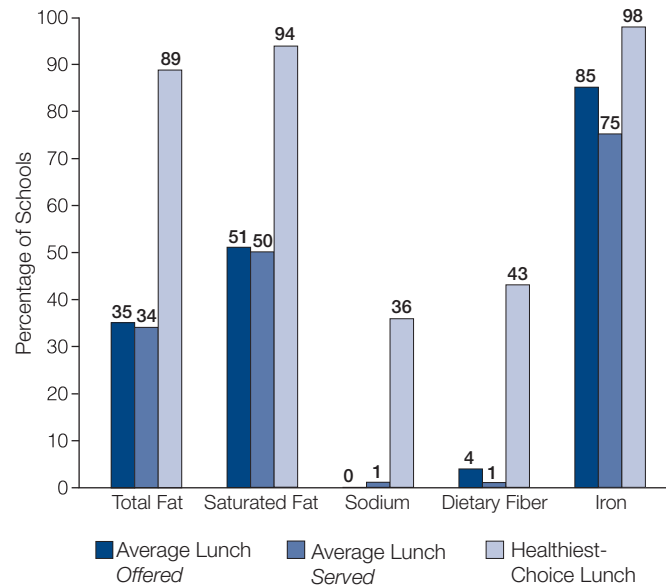
The analysis for each nutrient was based on the healthiest choices *offered* each day (for example, the lowest-fat choices or the highest-dietary-fiber choices) in each school. Although the availability of meals that meet the more challenging nutrition standards does not guarantee that students will select such meals, information about the availability of these meals can provide policymakers with helpful insights about the relative ease or difficulty of *offering* meals that meet specific nutrition standards.

Key findings from this analysis include the following:

- The vast majority of schools *offered* students the opportunity to select lunches that met the SMI standards for total fat, saturated fat, and iron (Figure 7).
- Students had the opportunity to select lunches that met the 2010 *Dietary Guidelines* recommendations for sodium and dietary fiber in about 40 percent of all schools (36 and 43 percent, respectively) (Figure 7). Thus, students had the opportunity to select lunches that met these standards in substantially more schools than suggested by findings for the average lunch *offered* and *served*.
- Relative to the average lunch *offered*, all of the healthiest-choice lunches did a better job of meeting the more

Figure 7.

The Average Healthiest-Choice Lunch Did a Better Job Meeting the Most Challenging Nutrition Standards than the Average NSLP Lunch Offered or the Average NSLP Lunch Served



NSLP = National School Lunch Program.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 6.2 and Tables E.3, E.7, and F.5).

challenging nutrition standards, especially the SMI standards for total fat and saturated fat and the 2010 *Dietary Guidelines* recommendation for dietary fiber. However, for all but the highest-dietary-fiber and the highest-iron lunches, the average healthiest-choice lunch was less likely to meet the SMI standard for calories than the average lunch *offered*.

Food Group Content of Average NSLP Lunches (Figures 8a–c)

- The average NSLP lunch *offered* and *served* in all three types of schools provided one-third or more of the daily amounts of grains, dairy foods, and oils recommended in the USDA Food Patterns, or came very close to meeting this target.
- The average NSLP lunch *offered* in all three types of schools provided more than one-third of recommended amounts of fruits (42 to 50 percent). The amount of fruit in the average NSLP lunch *served* was notably smaller (22 to 32 percent of recommended amounts), suggesting that many students did not include a serving of fruit in their lunches.

Figure 8a.

The Average NSLP Lunches Offered and Served Generally Provided One-third or More of Recommended Daily Amounts of Grains, Dairy Foods, and Oils, but Were High in Calories from Solid Fats and Added Sugars

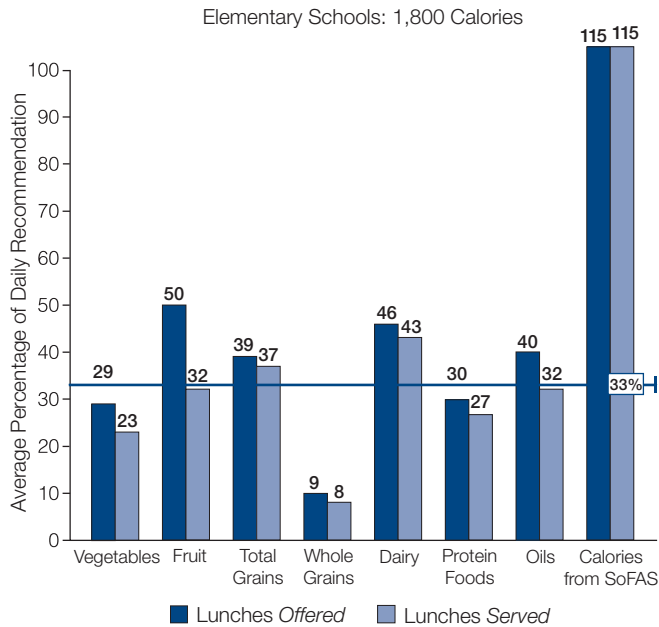


Figure 8b.

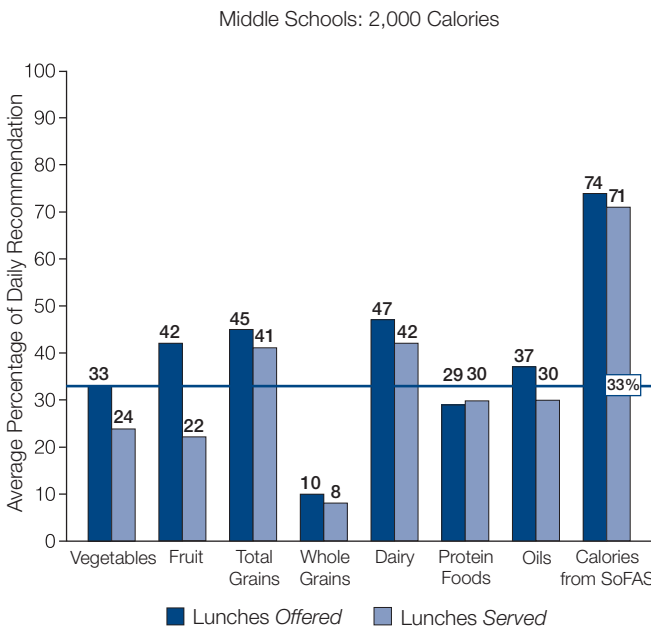
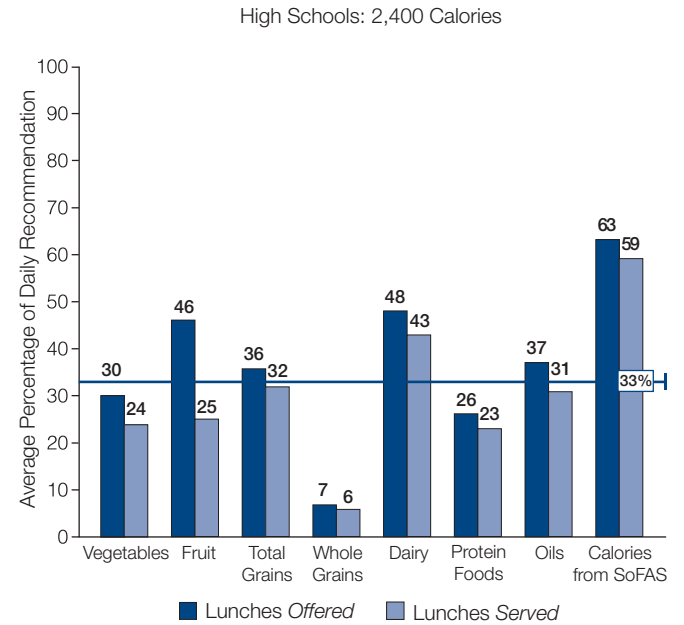


Figure 8c.



Notes: Daily recommendations are based on USDA Food Patterns. Calorie levels used for each type of school are based on the calorie levels used by the Institute of Medicine in developing recommendations for revised nutrition standards for school meals.

The 33-percent benchmark is used for illustrative purposes only and is based on the SMI standard that NSLP meals should provide one-third of students' average daily calorie and nutrient needs.

NSLP = National School Lunch Program; SoFAS = solid fats and added sugars.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 8.1).



- On average, NSLP lunches as *offered* provided about 30 percent of recommended daily amounts of vegetables; as *served*, NSLP lunches provided about one-quarter of recommended daily amounts of vegetables.
- Average NSLP lunches *offered* and *served* were low in whole grains, providing 6 to 10 percent of recommended daily amounts.
- On average, NSLP lunches *offered* and *served* in elementary and middle schools provided roughly 30 percent of the recommended daily amounts of protein foods. NSLP lunches *offered* and *served* in high schools provided about one-quarter of recommended daily amounts of protein foods.
- Average NSLP lunches *offered* and *served* were high in calories from solid fats and added sugars (SoFAS), particularly in elementary schools. Elementary school students have the lowest calorie requirements and, consequently, their diets have little room for calories from SoFAS. The number of SoFAS calories in the average NSLP lunch *offered* and *served* in elementary schools was 15 percent above the maximum recommended for the entire day. The number of SoFAS calories in the average NSLP lunch *offered* and *served* in middle and high schools was equivalent to about 60 to 75 percent of the recommended daily maximum.

SoFAS calories in average NSLP lunches *offered* were contributed by a wide variety of foods.

- In both NSLP lunches *offered* and *served*, about 62 percent of SoFAS calories came from solid fats and about 38 percent came from added sugars. The solid fats in the average NSLP lunch *offered* were contributed by a wide variety of foods; however, combination entree items and meat/meat alternates contributed 59 percent of solid fats and milk contributed 15 percent of solid fats.²⁰ SoFAS calories contributed by added sugars also came from a wide variety of foods. Flavored milks accounted for 31 percent of added sugars in NSLP lunches *offered*, followed by combination entrees and meat/meat alternates (19 percent).
- The relative contribution of specific foods to SoFAS calories in NSLP lunches is influenced by both the amount of solid fat and added sugar in the food and the frequency with which it is offered. The top five contributors to SoFAS calories in average NSLP lunches *offered* were 1% flavored milk (10 percent), cookies, cakes and brownies (8 percent), pizza and pizza products (6 percent), condiments, toppings, and spreads

(6 percent), and flavored skim/nonfat milk (5 percent). There was some variation in the relative contribution of these foods to SoFAS calories in lunches *offered* in elementary and secondary schools and, among secondary schools, hamburgers and cheeseburgers rather than flavored skim/nonfat milk was the fifth leading contributor of SoFAS calories.

Breakfasts Offered and Served in Public NSLP Schools

Calorie and Nutrient Content of Average SBP Breakfasts

Most schools *offered* and *served* average SBP breakfasts that were consistent with the SMI standards for target nutrients, but fewer schools met the SMI standard for calories (Figure 9).

- For each of the SMI target nutrients, 92 percent or more of all schools *offered* average SBP breakfasts that met the SMI standards.
- Fewer schools met the SMI standards for the average SBP breakfast *served*. This is consistent with the fact that students do not necessarily take one serving of all foods offered to them. Still, for each of the SMI target nutrients, more than 80 percent of all schools *served* average SBP breakfasts that met or came within 10 percent of the standard.
- Similar to the pattern observed for NSLP lunches, substantially fewer schools met the SMI standard for calories than the SMI standards for target nutrients. For both breakfasts *offered* and breakfasts *served*, only about 20 percent of schools met the SMI standard for calories and about 20 percent more came within 10 percent of this standard.

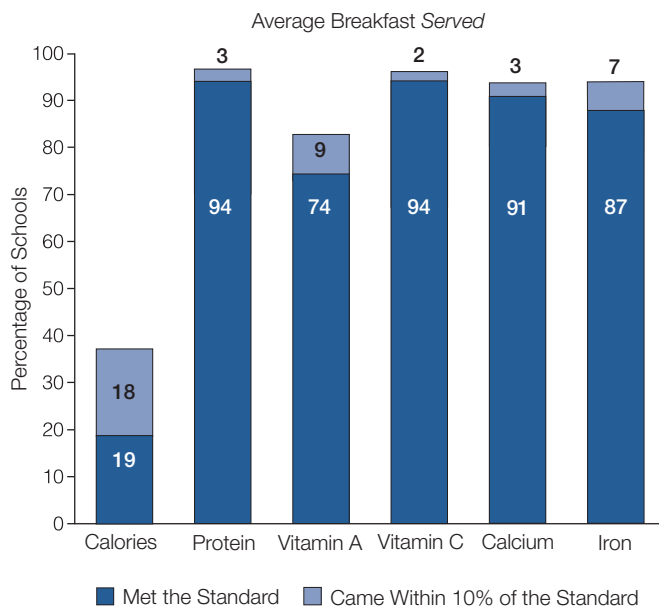
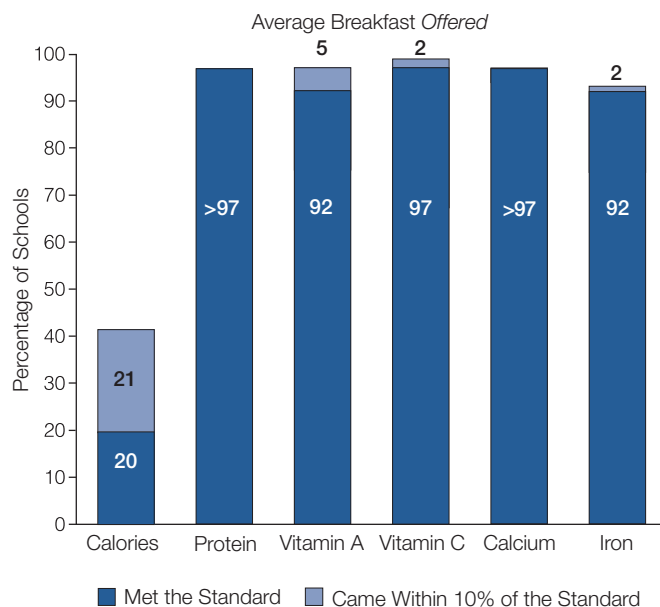
Most schools *offered* and *served* average SBP breakfasts that met the SMI standard for total fat (no more than 30 percent of total calories from fat) or came within 10 percent of this standard (Figure 10).

- Overall, 98 percent of schools *offered* SBP breakfasts and 94 percent of schools *served* SBP breakfasts that, on average, met the SMI standard for total fat or came within 10 percent of meeting this standard (which is equivalent to 30.1 to 33.0 percent of total calories from fat).

Schools were less likely to meet the 2010 Dietary Guidelines recommendation for total fat than the corresponding SMI standard (Figure 10).

Figure 9.

Most Schools Offered and Served SBP Breakfasts that Met or Came Within 10 Percent of the SMI Standards for Target Nutrients, but Less than Half of All Schools Met or Came Within 10 Percent of the SMI Standard for Calories



Note: >97 is displayed for percentages between 97 and 100 when the point estimate is considered less precise because of a large coefficient of variation. SBP = School Breakfast Program; SMI = School Meals Initiative for Healthy Children.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Tables G.4 and G.8).

- This is the opposite of the pattern observed for NSLP lunches. The reason for the difference is that breakfasts were lower in fat than lunches. On average, fat provided about 22 to 24 percent of the calories in breakfasts. This level was consistent with the SMI standard for total fat (no more than 30 percent of total calories), but fell below the lower end of the range of fat intake recommended for school-age children in the 2010 *Dietary Guidelines* (25 to 35 percent of total calories).
- The fact that, on average, breakfasts *offered* in the SBP were somewhat low in fat, relative to the 2010 *Dietary Guidelines* is not necessarily a negative finding. Fat is a nutrient of interest because most Americans consume too much fat. Thus, meals that exceed the *Dietary Guidelines* recommendation for total fat, on average, are a concern because they contribute to the potential for overconsumption. However, meals that are somewhat low in average calories from fat are less of a concern because, in children's overall diets, these meals may balance out other meals and snacks that are higher in relative fat content.

More than 85 percent of all schools offered and served average SBP breakfasts that met the SMI standard for saturated fat (less than 10 percent of total calories from saturated fat) or came within 10 percent of this standard (Figure 10).

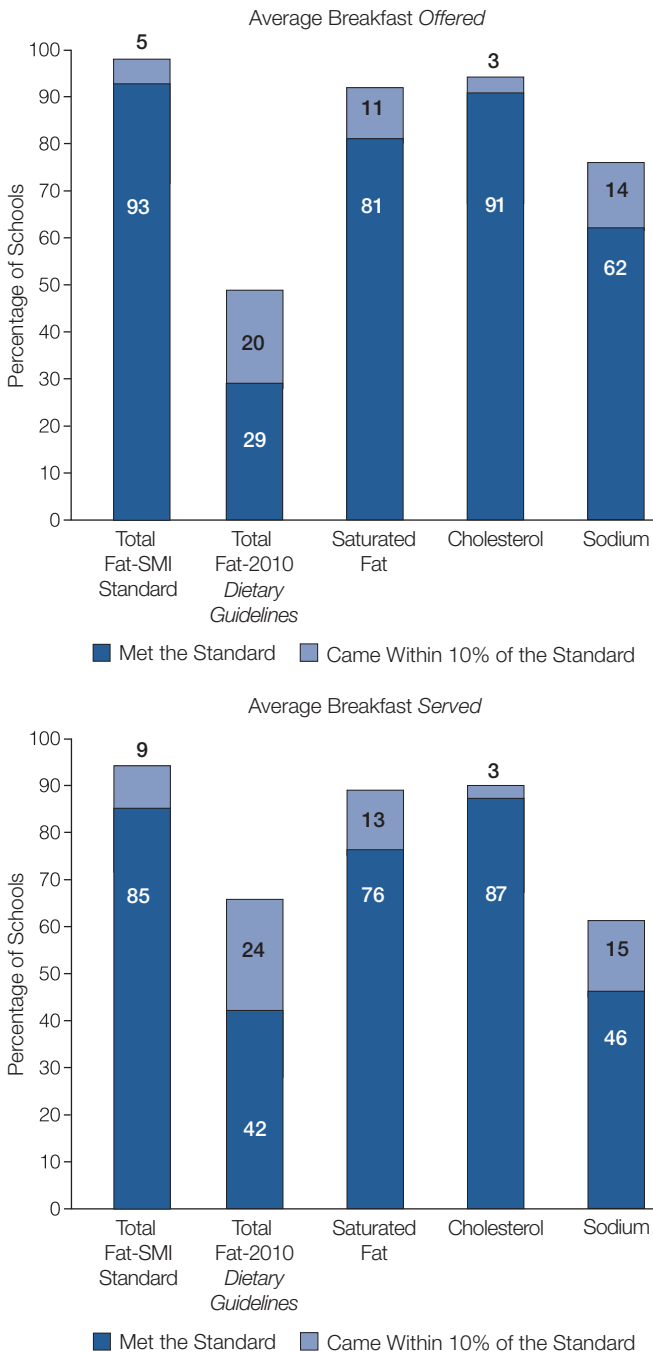
- More than three-quarters of all schools *offered* and *served* average SBP breakfasts that were consistent with the SMI standard for saturated fat.
- An additional 11 percent of schools *offered* average SBP breakfasts that came within 10 percent of this standard (which is equivalent to 10.0 to 10.9 percent of total calories from saturated fat), and an additional 13 percent of schools *served* average breakfasts that came within 10 percent of this standard.

Few schools offered or served average SBP breakfasts that met all of the SMI standards (data not shown in figure).

- Overall, 15 percent of schools *offered* average SBP breakfasts that met *all* of the SMI standards and 11 percent of schools *served* average SBP breakfasts that met *all* of the SMI standards. As discussed above and shown in Figures 9 and 10, the SMI standard that was the most challenging for schools to meet in SBP breakfasts was the standard for minimum calories.

Figure 10.

Most Schools Offered and Served SBP Breakfasts that, on Average, Met or Came Within 10 Percent of the SMI Standards for Total Fat and Saturated Fat, as well as the 2010 Dietary Guidelines Recommendations for Cholesterol and, to a Lesser Extent, Sodium



Note: The standard for saturated fat is the same for the SMI and the 2010 Dietary Guidelines. The standards for cholesterol and sodium are based on the 2010 Dietary Guidelines.

SBP = School Breakfast Program; SMI = School Meals Initiative for Healthy Children.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Tables G.4 and G.8).

About 90 percent of all schools offered and served average SBP breakfasts that met the 2010 Dietary Guidelines recommendation for cholesterol, and sizeable proportions of schools offered and served breakfasts that were consistent with the 2010 Dietary Guidelines recommendation for sodium (Figure 10).

- About 90 percent of all schools offered and served breakfasts that met the 2010 Dietary Guidelines recommendations for cholesterol.
- Relative to NSLP lunches, schools did a better job meeting the 2010 Dietary Guidelines recommendation for sodium at breakfast, particularly for breakfasts as offered. The average SBP breakfast offered in 62 percent of schools was consistent with the 2010 Dietary Guidelines recommendation for sodium, and the average breakfast offered in another 14 percent of schools came within 10 percent of this standard.
- Schools were less likely to meet the sodium standard for breakfasts as served (46 percent versus 62 percent for breakfasts as offered), which suggests that students tended to select higher-sodium breakfast foods more frequently than lower-sodium options.
- Essentially no schools offered or served SBP breakfasts that were consistent with the 2010 Dietary Guidelines recommendation for dietary fiber (data not shown in figure). The dietary fiber content of the average breakfast offered and served in most schools was more than 50 percent below the recommended level of 14 grams per 1,000 calories.

Trends in the Nutrient Content of Average SBP Breakfasts Since SY 1998–1999²¹

As noted previously, three SNDA studies have been conducted since the SMI was enacted—SNDA-II in SY 1998–1999; SNDA-III in SY 2004–2005; and the present study, SNDA-IV, in SY 2009–2010. Nutrition standards for school meals were the same throughout this period—the SMI standards—and FNS policy was intended to maintain or increase the proportion of schools that met these standards. Thus, it is useful to understand how characteristics of school meals have changed over this period. Comparisons focus on estimates of meals as served and present data for elementary and secondary schools (middle and high schools combined) because these are the breakdowns used in previous published comparisons of data from the SNDA studies.

Percentage of Schools Meeting SMI Standards for Calories and Target Nutrients (Figure 11)

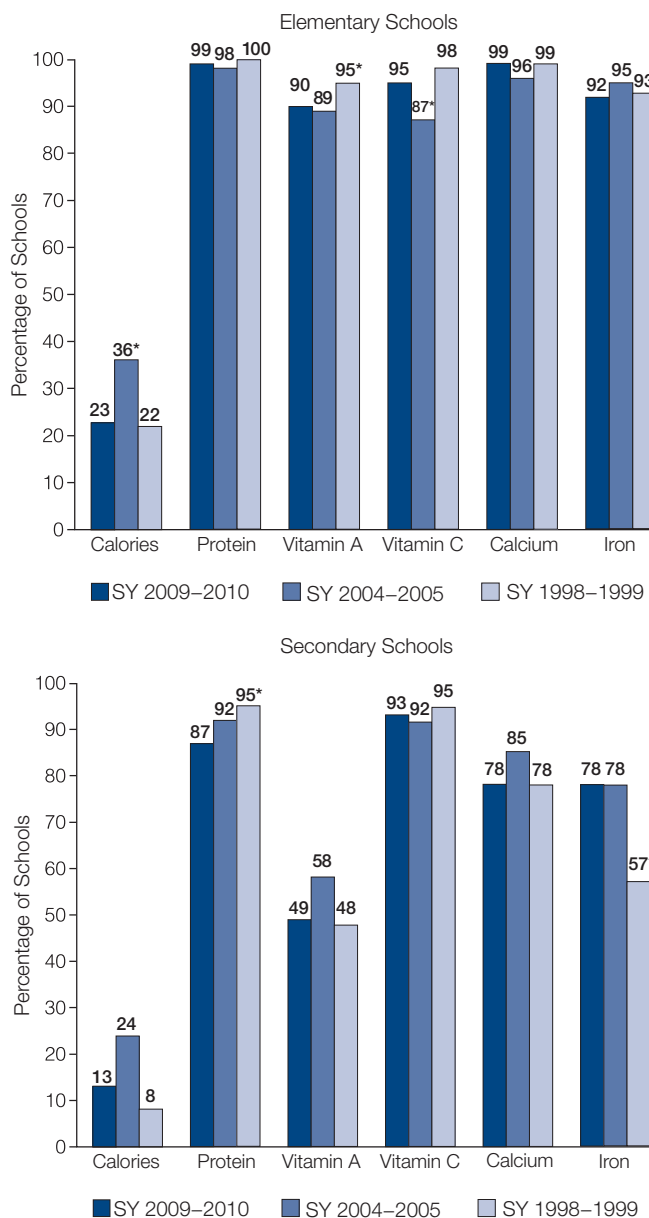
- Significantly fewer elementary schools met the SMI standard for calories in SY 2009–2010 than in SY 2004–2005 (23 versus 36 percent). A parallel drop was noted for secondary schools, but the difference between SYs 2009–2010 and 2004–2005 was not statistically significant. At all three points in time, secondary schools were considerably less likely than elementary schools to *serve* breakfasts that met the SMI standard for calories.
- Compared with SY 2004–2005, SBP breakfasts *served* in SY 2009–2010 in both elementary and secondary schools were generally as likely to satisfy the SMI standards for protein, vitamins A and C, calcium, and iron.
- Between SYs 1998–1999 and 2009–2010, there was a significant drop in the proportion of elementary schools *serving* breakfasts that met the SMI standard for vitamin A (95 versus 90 percent).
- Among secondary schools, there was a significant drop in the proportion of schools that met the SMI standard for protein (95 versus 87 percent) and a significant increase in the proportion that met the SMI standard for iron (57 versus 78 percent) between SYs 1998–1999 and 2009–2010.

Percentage of Schools Meeting SMI Standards for Total Fat and Saturated Fat (Figure 12)

- As noted for NSLP lunches, both elementary and secondary schools made steady progress over time in meeting the SMI standards for total fat and saturated fat in SBP breakfasts. Differences between school years were less dramatic than those observed for NSLP lunches, however, because breakfasts have always been lower in fat and saturated fat than lunches.
- Between SYs 2004–2005 and 2009–2010, there was no significant change in the proportion of elementary schools that *served* breakfasts that satisfied the SMI standards for total fat and saturated fat or in the proportion of secondary schools that satisfied the SMI standard for saturated fat.
- The proportion of secondary schools that *served* breakfasts that met the SMI standard for total fat increased significantly between SYs 2004–2005 and 2009–2010 (from 67 to 80 percent).

Figure 11.

In SYs 2009–2010 and 2004–2005, Similar Proportions of Schools Served SBP Breakfasts that Met SMI Standards for Target Nutrients, but in SY 2009–2010, Fewer Schools Met the SMI Standard for Calories



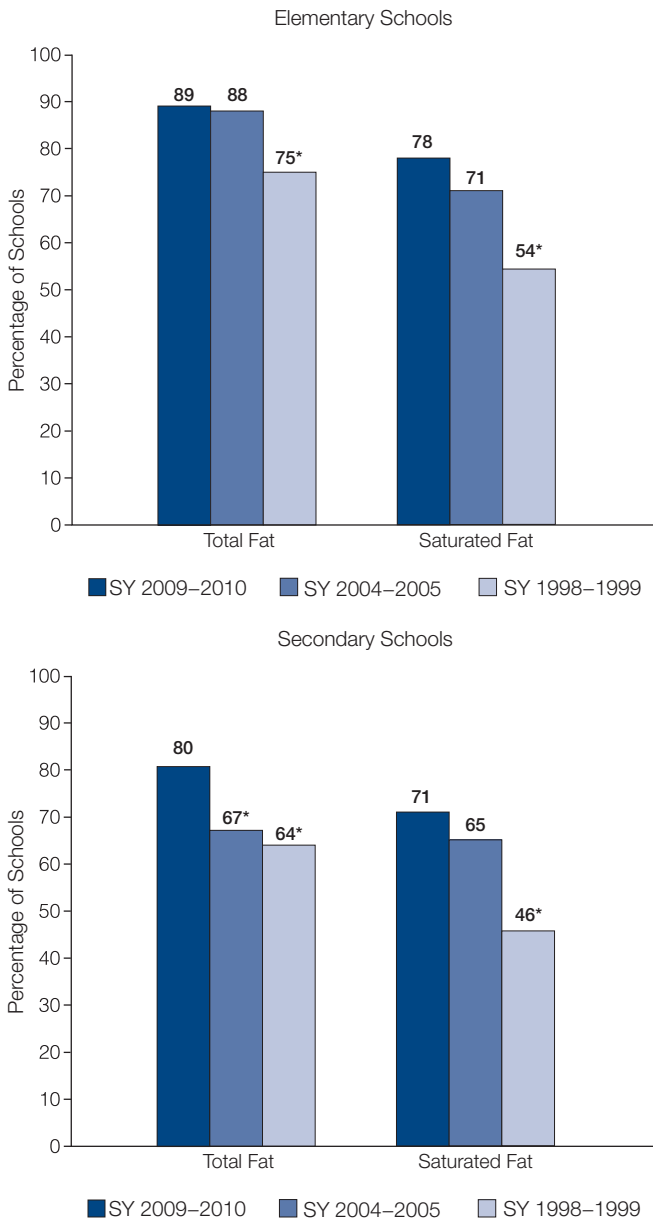
* Proportion is significantly different from SY 2009–2010 at the .05 level.

SBP = School Breakfast Program; SMI = School Meals Initiative for Healthy Children; SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 11.5) and School Nutrition Dietary Assessment Studies-III and -II, Menu Surveys.

Figure 12.

The Percentage of Schools *Serving* SBP Breakfasts that Met SMI Standards for Total Fat and Saturated Fat Has Increased Significantly Since SY 1998–1999 but There Were Few Significant Increases Between SYs 2004–2005 and 2009–2010



Note: The SMI standard for total fat is no more than 30 percent of calories from fat and the SMI standard for saturated fat is less than 10 percent of calories from saturated fat.

* Proportion is significantly different from SY 2009–2010 at the .05 level.

SBP = School Breakfast Program; SMI = School Meals Initiative for Healthy Children; SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 11.6) and School Nutrition Dietary Assessment Studies-III and -II, Menu Surveys.

- Compared with SY 1998–1999, schools in SY 2009–2010 were significantly more likely to *serve* average SBP breakfasts that met the SMI standards for both total fat and saturated fat.

Percentage of Schools Meeting Other Standards and Recommendations

- Between SY 2004–2005 and SY 2009–2010, there was a statistically significant drop in the percentage of schools that *served* average SBP breakfasts that met *all* of the SMI standards (from 20 to 11 percent). This pattern is consistent with a decrease over this period in the percentage of schools that met the SMI standard for minimum calories.

There have been no statistically significant changes over time in the proportion of schools meeting the standards used to assess cholesterol and sodium content of average breakfasts.

- At all three points in time, the majority of schools (76 to more than 90 percent) *served* breakfasts that met the standard for cholesterol.
- At all three points in time, the proportion of schools meeting the standard for sodium has generally been substantially lower than for all other standards except calories. The proportion of schools meeting the standard for sodium increased by about 10 percentage points between SYs 2004–2005 and 2009–2010; however, this increase was not statistically significant.

Food Group Content of Average SBP Breakfasts (Figures 13a–c)

- The average SBP breakfast *offered* and *served* in all three types of schools provided one-quarter or more of the recommended daily amounts of fruit, grains, and dairy foods, or came very close to meeting these targets.
- The average SBP breakfast *offered* and *served* in all three types of schools provided limited amounts of whole grains (5 to 11 percent of recommended amounts), lean protein foods (6 to 9 percent), and oils (3 to 5 percent). Vegetables were infrequently offered in SBP breakfasts.

Figure 13a.

The Average SBP Breakfasts Offered and Served Generally Provided One-quarter or More of Recommended Daily Amounts of Fruit, Grains, and Dairy Foods, but Were High in Calories from Solid Fats and Added Sugars

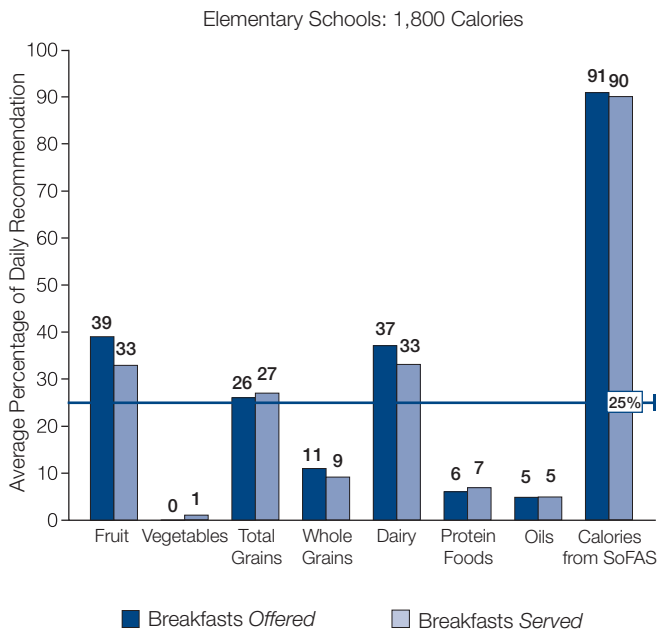


Figure 13b.

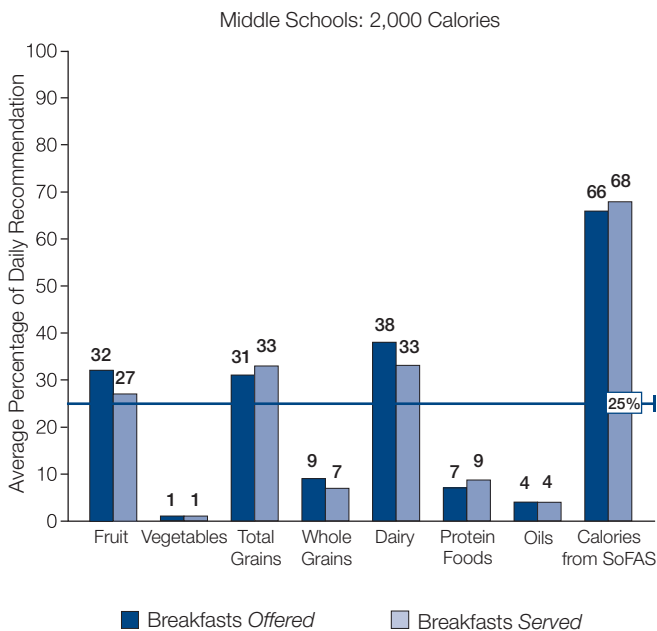
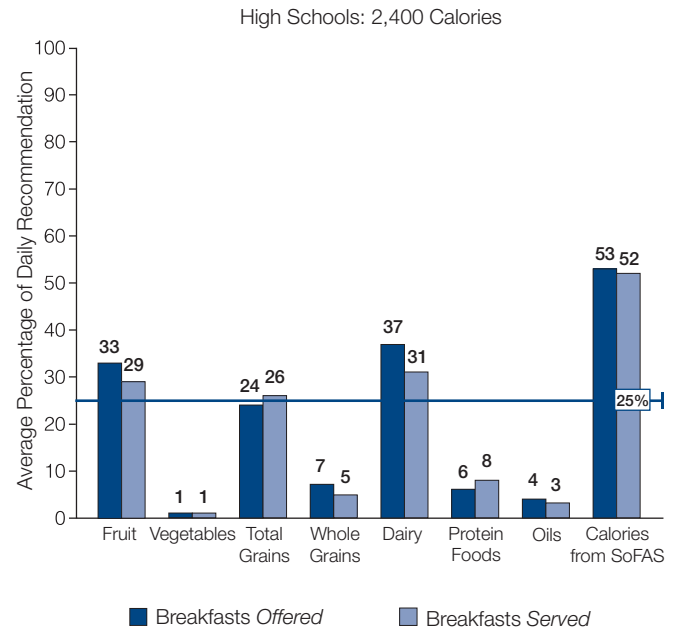


Figure 13c.



Notes: Daily recommendations are based on USDA Food Patterns. Calorie levels used for each type of school are based on the calorie levels used by the Institute of Medicine in developing recommendations for revised nutrition standards for school meals.

The 25-percent benchmark is used for illustrative purposes only and is based on the SMI standard that SBP meals should provide one-fourth of students' daily calorie and nutrient needs.

SBP = School Breakfast Program; SoFAS = solid fats and added sugars.

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey (see Volume I, Figure 8.3).

- Average SBP breakfasts *offered* and *served* were high in calories from SoFAS, particularly in elementary schools where students have the lowest calorie requirements and, consequently, less room in their diets for SoFAS calories. The number of SoFAS calories in the average SBP breakfast *offered* and *served* in elementary schools was equivalent to about 90 percent of the maximum recommended for the entire day. The number of SoFAS calories in the average SBP breakfast *offered* and *served* in high and middle schools was equivalent to about 50 to 70 percent of the recommended daily maximum, respectively.

In the average SBP breakfast *offered*, grains and grain products and milk were leading contributors to both solid fats and added sugars.

- Overall, solid fats and added sugars each contributed about half of the total calories from SoFAS in the aver-

age SBP breakfast *offered*. In the average SBP breakfast *served*, which reflects students' food selection patterns, solid fats contributed a larger share of SoFAS calories than added sugars (54 percent versus 46 percent). There was some variation in this pattern by school type. Solid fats accounted for a significantly larger share of SoFAS calories in the average breakfasts *served* in middle and high schools, relative to elementary schools (55 and 58 percent, respectively, versus 52 percent), and added sugars accounted for a significantly smaller share of SoFAS calories (45 and 42 percent, respectively, versus 48 percent).

- As a group, grains and grain products were the leading contributors to both solid fats and added sugars in the average SBP breakfasts *offered*.²² Foods in this group contributed 40 percent of the solid fats and 45 percent of the added sugars in SBP breakfasts *offered*. Milk was the next leading contributor of solid fats and added sugars, accounting for 24 percent of solid fats and 23 percent of added sugars in the average SBP breakfast *offered*.
- The relative contribution of specific foods to SoFAS calories in SBP breakfasts is influenced by both the amount of solid fat and added sugar in the food and the frequency with which it is offered. Overall, the top five contributors to SoFAS calories in the average SBP breakfast *offered* were sweet rolls, donuts, and toaster pastries (13 percent), condiments, toppings, and spreads (12 percent), cold cereal (10 percent), 1% flavored milk (10 percent), and muffins and sweet/quick breads (5 percent). Together, these five foods accounted for half of the SoFAS calories in SBP breakfasts. There was some variation in the relative contribution of these foods to SoFAS calories in elementary and secondary schools and, among secondary schools, breakfast sandwiches rather than muffins and sweet/quick breads was the fifth leading contributor of SoFAS calories.

Afterschool Snacks Offered in Public NSLP Schools

Since 1998, schools that participate in the NSLP have been eligible to receive cash reimbursement for snacks served in afterschool programs. To be eligible for reimbursement, snacks must be served in afterschool programs that provide children with regularly scheduled educational or enrichment activities in a supervised environment. In addition, snacks

must be served free or at a reduced price to children from low-income families and must contain at least two of the following four components: (1) a serving of fluid milk; (2) a serving of vegetables, fruits, or 100% fruit or vegetable juice; (3) a serving of meat or meat alternate; or (4) a serving of whole grain or enriched bread or cereal.

SNDA-IV is the first study to collect data from a national sample of schools providing reimbursable afterschool snacks. Key findings include the following:

- Nationally, 27 percent of schools that participate in the NSLP provide reimbursable afterschool snacks. Elementary schools are more likely to provide snacks than middle or high schools (33 percent versus 23 and 13 percent, respectively).
- A majority (69 percent) of schools that provide afterschool snacks do so on a daily basis, either by dropping the snacks off or making arrangements for afterschool program staff to pick up the snacks.
- More than half of all schools that provide afterschool snacks reported offering students a grain/bread item (75 percent), milk (60 percent), or fruit/100% juice (51 percent) as one of the two meal components required for an afterschool snack.
- Overall, there was very little choice among food groups in afterschool snacks. Among schools that offered milk as a component in the afterschool snack, most offered only one type (unflavored 1% milk was the most commonly offered milk). The same pattern was seen with fruits, vegetables, and 100% juice, as well as grains and breads.
- On average, snacks provided almost half (47 percent) of the recommended maximum of SoFAS calories for a 1,800-calorie diet. More than half (55 percent) of the SoFAS calories in the average snack came from solid fats and 45 percent came from added sugars.
- The top five contributors to SoFAS calories in afterschool snacks were crackers and pretzels (30 percent), 1% flavored milk (10 percent), cookies, cakes and brownies (10 percent), flavored skim/nonfat milk (9 percent), and unflavored 1% milk (5 percent). Together, these five foods accounted for 64 percent of the SoFAS calories in afterschool snacks.

Section IV



School Food and Physical Activity Environments

Historically, USDA has had limited control over school-level policies and practices that, although not directly associated with the school meal programs, may influence children’s dietary intakes and overall health. This includes, for example, policies and practices related to nutrition education and promotion, physical education, opportunities for physical activity, and the availability of competitive foods. In concert with characteristics of the meals offered to students through the NSLP and SBP, these policies and practices constitute a school’s food and physical activity environment. Research has shown that school environments are associated with students’ dietary behaviors, physical activity levels, and body weight.²³ For this reason, changing school environments has been suggested as a population-based approach to reducing childhood obesity.²⁴

In recent years, Congress has enhanced USDA’s ability to have a broader influence on schools’ food and physical activity environments. The Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265) required that all SFAs participating in the NSLP implement a comprehensive school wellness policy beginning in SY 2006–2007. The HHFKA expanded the scope of these wellness policies; required additional stakeholder involvement in the development, implementation and review of the policies; and required public

updates on the content and implementation of the policies. The intent of the new provisions was to strengthen school wellness policies so they become useful tools in evaluating, establishing, and maintaining healthy school environments.²⁵ Schools were expected to review their existing policies and begin planning for the required expansions in SY 2011–2012. In addition, the HHFKA required that USDA establish nutrition standards for all foods sold or served in schools at any time during the school day.

Presence and Implementation of Local Wellness Policies

- In SY 2009–2010, SFA directors in 96 percent of SFAs reported that a district-level wellness policy was in place, and most SFAs (73 percent) had a designated wellness coordinator.
- Directors in more than three-quarters of SFAs reported that required wellness policy components related to nutrition education and physical activity were fully or partially implemented. These components were still being planned in another 6 to 9 percent of SFAs.
- The prevalence of wellness policies has increased sharply since SY 2004–2005 at both the school and district levels.

In SY 2004–2005, the proportion of schools reporting a district policy ranged from 14 percent for high schools to 29 percent for elementary schools. By SY 2009–2010, the proportion of schools reporting a district-level wellness policy had increased to 70 percent of high schools and 77 percent of elementary schools. This increase is consistent with the mandate for comprehensive wellness policies that was established in the Child Nutrition and WIC Reauthorization Act of 2004.

- In SY 2009–2010, the vast majority of SFAs had some type of ban or restriction on the availability of sweetened beverages or snack foods on school grounds. More than 80 percent of SFAs had some type of ban or restriction related to sweetened beverages and more than 75 percent had a ban or restriction related to other foods/snack items. These bans or restrictions most often applied to all schools in the SFA (rather than applying to only some schools).²⁶
- Between SYs 2004–2005 and 2009–2010, there was a dramatic increase in the percentage of districts that reported district-wide bans or restrictions on sweetened beverages or other foods/snack items. In SY 2004–2005, only 6 and 10 percent of SFA directors reported a district-wide ban or restriction on sweetened beverages or other foods/snack items, respectively. In SY 2009–2010, the percentage of SFA directors that reported a district-wide ban or restriction on sweetened beverages was more than nine times higher (53 percent), and the percentage reporting a district-wide ban or restriction related to other foods/snack items was more than 4.5 times higher (46 percent). Both of these differences were statistically significant.

School Requirements for Nutrition Education, Physical Education, and Opportunities for Physical Activity

- Most schools, ranging from 61 percent of elementary schools to 72 percent of middle schools, required some amount of classroom-based nutrition education in SY 2009–2010. Among schools requiring classroom-based nutrition education, 89 percent required nutrition education for all grades.
- Overall, 95 percent of schools had a requirement for physical education (PE). High schools were more likely than either elementary or middle schools not to have a PE requirement (10 versus 3 percent).



- Based on principals' reports about required PE classes and the amount of time students spend in PE, fewer than one in five schools (18 percent) met or exceeded guidelines from the National Association for Sport and Physical Education (NASPE), which recommends that schools provide 150 minutes per week of instructional PE for elementary school students and 225 minutes per week for middle and high school students each week of the school year.
- Among schools that require year-round PE (a core component of the NASPE recommendation), 22 percent of schools met the NASPE guideline. High and middle schools were more likely to do so than elementary schools (44 and 30 percent versus 16 percent).
- About two-thirds (66 percent) of all schools reported offering students regular opportunities for physical activity during the school day in settings other than PE classes. This practice was much more common among elementary schools than either middle or high schools (86 percent versus 45 and 28 percent, respectively).

Competitive Foods

- Foods made available to students outside of school meals are referred to as *competitive foods*. Competitive foods can be offered through a la carte sales in school cafeterias or through other venues, including vending machines, school stores, snack bars, and fund raisers. In SY 2009–2010, 82 percent of elementary schools, 95 percent of

middle schools, and 90 percent of high schools had a la carte offerings available at lunch. Smaller percentages of schools (58, 74 and 70 percent, respectively) had a la carte offerings available at breakfast.

- Vending machines were widely available in high schools (85 percent), but were somewhat less common in middle schools (67 percent) and were rare in elementary schools (13 percent).
- On average, middle schools that had beverage vending machines in SY 2009–2010 allocated more space to 100% juice and water than to other types of beverages (carbonated sodas, energy/sports drinks, juice drinks, and chocolate drinks) (58 versus 41 percent).²⁷ In contrast, high schools allocated more space to other beverages than to 100% juice and water (52 versus 44 percent).
- Schools that had snack machines in SY 2009–2010 allocated most (85 percent, on average) of the available space to snack foods (as opposed to baked goods and other types of food). Snack chips accounted for an average of 32 percent of the available space in snack machines. In middle schools, low-fat chips were more prevalent than regular chips (22 versus 15 percent); in high schools, the two types of chips were equally prevalent (16 to 17 percent).
- Based on principals' reports, school stores that sold foods and beverages and snack bars were available in 13 and 4 percent of all schools, respectively. Both of these competitive food venues were available in more middle schools than elementary schools and in more high schools than middle schools.

Trends in the Availability of Competitive Foods Since SY 2004–2005²⁸

In both SNDA-III (SY 2004–2005) and SNDA-IV (SY 2009–2010), data on the availability of competitive foods were collected from multiple respondents. FSMs provided information about whether foods and beverages were available for a la carte purchase outside the school meal programs. Principals provided information about the availability of vending machines and school stores. In addition, competitive foods checklists provided information about the availability of vending machines, school stores, and other venues. In SNDA-III, which included on-site data collection for many sampled schools, field interviewers completed these checklists. In SNDA-IV, which did

not include on-site data collection, most checklists were completed by a school staff member designated by the principal. In some schools, the school staff member completed the checklists over the telephone.

A la Carte Foods and Beverages

- There was no significant change between SYs 2004–2005 and 2009–2010 in the availability of a la carte foods and beverages. At both points in time, a la carte offerings were available at lunch in more than three-quarters of elementary schools and about 90 percent or more of middle and high schools. Fewer schools offered a la carte options at breakfast, and the percentage that did so remained relatively constant between SYs 2004–2005 and 2009–2010 in elementary and middle schools. The percentage of high schools offering a la carte items at breakfast was about 12 percentage points lower in SY 2009–2010 than in SY 2004–2005, but this difference was not statistically significant.

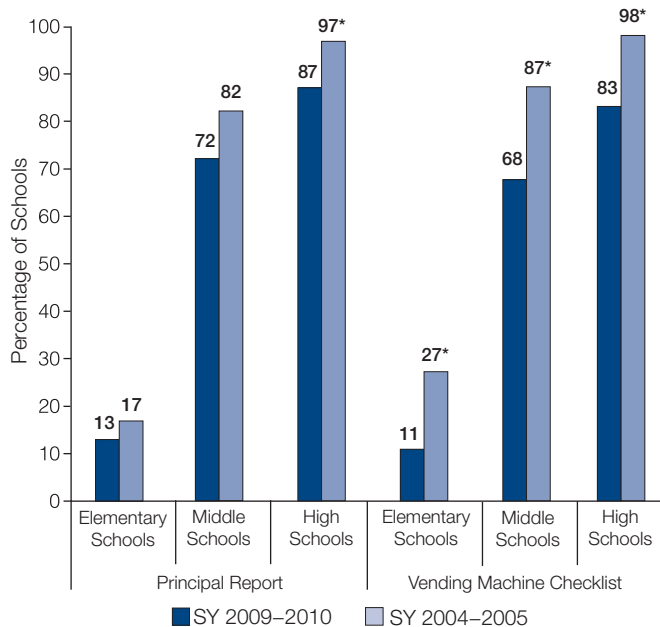
Vending Machines (Figure 14)

- Findings about changes in the availability of vending machines between SYs 2004–2005 and 2009–2010 vary by data source.²⁹ According to the vending machine checklists, significantly fewer schools had vending machines available in SY 2009–2010 than in SY 2004–2005. This was true for elementary, middle, and high schools alike and the decrease between the two periods ranged from 15 to 19 percentage points.
- In contrast, data from the principal surveys show a significant decrease in the availability of vending machines only among high schools—from 97 percent of high schools in SY 2004–2005 to 87 percent of high schools in SY 2009–2010.

In both SNDA-III and SNDA-IV, there were discrepancies between estimates of the percentage of schools with vending machines based on principal surveys and the vending machine checklists. In SNDA-III, estimates based on the checklist were consistently higher than estimates based on the principal survey. The difference ranged from 1 to 10 percentage points across school types and was greatest for elementary schools (for example, 27 versus 17 percent for the SNDA-III (SY 2004–2005) estimates of the availability of vending machines in elementary schools, based on the vend-

Figure 14.

Vending Machines Were Widely Available in Middle and High Schools in Both SY 2009–2010 and SY 2004–2005



* Proportion is significantly different from SY 2009–2010 at the .05 level.
SY = school year.

Source: School Nutrition Dietary Assessment Study-IV, Principal Survey and Vending Machine Checklist (see Volume I, Table 11.11) and School Nutrition Dietary Assessment Study-III, Principal Survey and Vending Machine Checklist.

ing machine checklist and principal survey, respectively). In SNDA-IV, discrepancies between the two data sources were smaller (2 to 4 percentage points) and the pattern of differences was reversed, with estimates based on the checklist being slightly but consistently lower than estimates based on the principal survey.

It is likely that the different data collection approaches used for the checklists in SNDA-III and SNDA-IV (field interviewers versus principal designees) contributed to the differences observed at the two points in time. At the time this report was prepared, we were unable to locate any corroborating evidence that the presence of vending machines decreased in the nation's schools between SYs 2004–2005 and 2009–2010 as dramatically as the vending machine checklist data would suggest. Thus, findings based on the comparison of data from the vending machine checklists should be interpreted with great caution. On balance, SNDA-IV researchers favor findings from the principal surveys.

School Stores and Snack Bars

- There was no significant change in the reported availability of school stores or snack bars between SYs 2004–2005 and 2009–2010.
- At both points in time, school stores and snack bars were notably less common than a la carte foods and beverages or vending machines. Based on principals' reports, school stores that sold foods or beverages were available in less than 10 percent of elementary schools, less than 20 percent of middle schools, and about one-quarter of high schools.
- Snack bars were even less common—reportedly available in 1 to 2 percent of elementary schools, 2 to 5 percent of middle schools, and about 10 percent of high schools at both points in time.

Section V



Schools Participating in the HealthierUS School Challenge

The HealthierUS School Challenge (HUSSC) was established in 2004 to recognize schools that create healthier school environments through their promotion of good nutrition and physical activity. HUSSC is designed to build on USDA's Team Nutrition initiative, which provides schools with nutrition education materials for children, families, and educators; technical assistance materials for foodservice directors, managers, and staff; and materials to build school and community support for healthy eating and physical activity. The chance to be recognized as a HUSSC school provides an incentive for schools to take increasingly bold steps to address the problems of childhood overweight and obesity.

Participation in HUSSC is voluntary. To be certified as part of HUSSC, a school must enroll in Team Nutrition and submit a formal application. Schools must verify that they meet HUSSC criteria for lunch menu planning practices and nutrient content that are more stringent than the standards that other schools must meet. HUSSC schools must also have a local school wellness policy that supports the HUSSC initiative and affirms that schools play a critical role in promoting student health and preventing obesity. HUSSC schools are certified for a period of four years and make a commitment to meet or exceed the HUSSC criteria for that four-year period.

Schools can reapply at the end of each certification period. A separately funded substudy in SNDA-IV collected information from a small sample of HUSSC schools. The goal of the substudy was to provide a snapshot of how HUSSC schools are doing, relative to other schools, in meeting the SMI standards and in implementing wellness policies.

Sample Design for the HUSSC Substudy

The HUSSC substudy used a non-random sample of HUSSC schools. The number of schools participating in the program at the time SNDA-IV data were collected (SY 2009–2010) was relatively small and was not nationally representative of all schools participating in the NSLP. Because the vast majority of schools that participated in HUSSC at that time were elementary schools, the sample for the HUSSC substudy was limited to public elementary schools.³⁰

The sampling frame was a file provided by FNS, which included information for all public elementary schools certified as HUSSC schools for SY 2009–2010. A non-random sample of 36 HUSSC schools was selected (from a list of 375 eligible schools) and was stratified by State, community type, enrollment, and grade span. Schools that were already part of the main SNDA-IV sample were excluded and only one

HUSSC school per SFA was selected. The resulting sample of HUSSC schools provided broad representation across FNS regions and variation across schools in community type, size (enrollment), and grade span. Findings from this purposeful sample are not formally representative of all public elementary schools participating in HUSSC in SY 2009–2010. However, the fact that the sample of 36 schools represented 9.7 percent of the eligible population of HUSSC schools (a relatively large proportion of the population in sampling terms) lends face validity to the ability of the sample to provide a reasonable snapshot of HUSSC elementary schools in SY 2009–2010 and insights about how HUSSC schools compared with elementary schools nationwide.

Sample Sizes and Data Sources

Of the 36 sampled HUSSC schools, 31 were successfully recruited into the study. The final sample of HUSSC schools included four additional elementary schools from the main SNDA-IV sample that were certified HUSSC schools in SY 2009–2010 (according to the list of HUSSC schools provided by FNS), for a total of 35 schools. All of the data collected for the main SNDA-IV study were collected from HUSSC schools. In addition, the methods used to analyze data for the HUSSC substudy were identical to those used in the main SNDA-IV study.

Key Findings for HUSSC Elementary Schools


NSLP Lunches

- For both NSLP lunches *offered* and *served*, a larger share of HUSSC elementary schools met the SMI standards for calories, vitamin C, and iron, on average, than elementary schools nationwide. This was also true for vitamin A in lunches *served*.
- For both NSLP lunches *offered* and *served*, a larger share of HUSSC elementary schools met SMI and 2010 *Dietary Guidelines* standards for total fat and saturated fat, on average, than elementary schools nationwide.
- HUSSC elementary schools did a better job than elementary schools nationwide in *offering* average NSLP lunches that met *all* of the SMI standards. Forty percent of HUSSC elementary schools *offered* average NSLP lunches that met *all* of the SMI standards, compared with 17 percent of all

elementary schools nationwide. A comparable pattern was noted for the average NSLP lunch *served*. However, few elementary schools in either group *served* average NSLP lunches that met *all* of the SMI standards (14 percent of HUSSC elementary schools and 9 percent of elementary schools overall).

- The proportion of daily lunch menus in HUSSC schools that included unflavored 1% milk was notably larger than the proportion in elementary schools nationwide (90 versus 74 percent) and the proportion of daily lunch menus that included unflavored 2% milk was notably lower (9 versus 28 percent). In addition, daily lunch menus in HUSSC schools were more likely to include skim milk, compared with lunch menus in elementary schools nationwide (54 versus 47 percent for unflavored skim milk, and 45 versus 39 percent for flavored skim milk). This pattern of findings likely reflects the fact that one of the criteria for HUSSC certification in SY 2009–2010 was that schools offer only 1% and fat-free milks.
- Raw vegetables were more commonly offered in HUSSC schools than elementary schools nationwide (63 percent of daily lunch menus versus 57 percent). Differences between HUSSC schools and elementary schools nationwide in the types of vegetables offered were relatively modest but were consistent with HUSSC criteria that required that dark green or orange vegetables be offered three times per week and legumes be offered at least once per week.
- More than 8 of 10 lunch menus in HUSSC schools (82 percent) included fresh fruit, compared with slightly more than half (56 percent) of lunch menus in elementary schools nationwide. Fewer than 1 in 5 lunch menus in HUSSC schools (18 percent) included 100% fruit juice, compared with more than one-quarter (26 percent) of lunch menus in elementary schools nationwide. Both of these findings are consistent with HUSSC criteria that required fresh fruit at least once per week (two days per week for the highest-level HUSSC awards) and limited 100% juice to once per week.

SBP Breakfasts

- There were relatively few differences between HUSSC elementary schools and elementary schools nationwide in the proportion of schools meeting SMI standards for target nutrients for breakfast. This is not surprising, given that the HUSSC certification criteria in place during SY 2009–2010 did not address breakfasts. Moreover, on average, more than 90 percent of HUSSC elementary schools and all elementary schools nationwide met the SMI standards for all target nutrients for breakfasts *offered* and breakfasts *served*.
 - Among HUSSC elementary schools, only 9 percent met the SMI standard for calories for the average SBP breakfast *offered*. The proportion of schools that met this standard was more than double for elementary schools nationwide, but was still quite low (24 percent). The disparity between HUSSC elementary schools and elementary schools nationwide in the proportion of schools meeting the SMI standard for calories was smaller for the average SBP breakfast *served* (17 versus 23 percent).
 - For SBP breakfasts *offered* and *served*, the majority of both HUSSC elementary schools and elementary schools nationwide met SMI standards for total fat and saturated fat.
 - Relatively few elementary schools in either group *offered* or *served* average SBP breakfasts that met *all* of the SMI standards. For the average SBP breakfast *offered*, fewer HUSSC elementary schools met *all* of the SMI standards than elementary schools overall (6 percent versus 19 percent). However, this difference evened out in the average SBP breakfast *served* (14 percent versus 15 percent), which reflects students' food selections. The SMI standard that posed the greatest challenge for both HUSSC elementary schools and all elementary schools nationwide was the standard for minimum calories.
- 
- Only about one-quarter of HUSSC elementary schools and an equivalent share of elementary schools nationwide met the 2010 *Dietary Guidelines* recommendation for total fat for the average breakfast *offered*. Schools that did not meet the 2010 *Dietary Guidelines* recommendation *offered* average SBP breakfasts that were low in fat, relative to this standard.
 - More schools in both groups met the 2010 *Dietary Guidelines* recommendation for total fat for the average breakfast *served*. This indicates that students tended to select higher-fat breakfast items (which increased the average percentage of calories from fat). More HUSSC elementary schools met the 2010 *Dietary Guidelines* recommendation for total fat in breakfasts *served* than all elementary schools nationwide (46 versus 33 percent).

For More Information

In January 2012, USDA issued new standards for school meals to be phased in over three years beginning with SY 2012–2013; available at [<http://www.fns.usda.gov/cnd/governance/legislation/nutritionstandards.htm>]. The data reported here, therefore, serve as a marker of progress since the School Meals Initiative for Healthy Children (SMI) nutrition standards were introduced in 1995 and a baseline for measuring future improvements under the new standards. The results also provide a benchmark for FNS to use in determining how to best improve the programs. For in-depth results, please consult the following technical reports:

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis, *School Nutrition Dietary Assessment Study-IV: Volume I: School Foodservice Operations, School Environments, and Meals Offered and Served*, by Mary Kay Fox, Elizabeth Condon, Mary Kay Crepinsek, Katherine Niland, Denise Mercury, Sarah Forrestal, Charlotte Cabili, Vanessa Oddo, Anne Gordon, Nathan Wozny, and Alexandra Killewald. Project Officer: Fred Lesnett, Alexandria, VA: November 2012.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis, *School Nutrition Dietary Assessment Study-IV: Volume II: Sampling and Data Collection Methods*, by John Hall, Eric Zeidman, Mary Kay Fox, Mary Kay Crepinsek, and Elizabeth Condon. Project Officer: Fred Lesnett, Alexandria, VA: November 2012.

Public-use datafiles can be obtained by writing or calling us at:

Office of Research and Analysis
Food and Nutrition Service, USDA
3101 Park Center Drive
Alexandria, VA 22302
(703) 305-2017

Endnotes

- ¹ The survey did not collect information about the source of the ban or restriction. Some districts may have been implementing bans or restrictions that were mandated by State policy.
- ² Ralston, K., C. Newman, A. Clauson, J. Guthrie, and J. Buzby. “The National School Lunch Program: Background, Trends, and Issues.” ERR-61, U.S. Department of Agriculture, Economic Research Service, July 2008.
- ³ U.S. Department of Agriculture, Food and Nutrition Service, National Annual Summary Tables (NSLP and SBP). Available at [www.fns.usda.gov/pd/cnpmain.htm]. Accessed July 2, 2012; U.S. Department of Agriculture, Food and Nutrition Service, May 2011 Program Information Report (afterschool snacks). Available at [www.fns.usda.gov/fns/data.htm]. Accessed July 2, 2012.
- ⁴ Burghardt, J.A., A. Gordon, N. Chapman, P. Gleason, and T. Fraker. “The School Nutrition Dietary Assessment Study: School Food Service, Meals Offered, and Dietary Intakes.” Nutrition Assistance Program Report Series, U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation, Alexandria, VA: October 1993.
- ⁵ Institute of Medicine. *School Meals: Building Blocks for Healthy Children*. Washington, DC: The National Academies Press, 2010.
- ⁶ SFAs administer the school meal programs at the local level and are usually individual school districts or small groups of districts.
- ⁷ U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition, and Analysis, “School Nutrition Dietary Assessment Study-III: Volume I: School Foodservice, School Food Environment, and Meals Offered and Served,” by Anne Gordon, Mary Kay Crepinsek, Renee Nogales and Elizabeth Condon. Project Officer: Patricia McKinney, Alexandria, VA: 2007.
- ⁸ U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition, and Analysis, “School Nutrition Dietary Assessment Study-III: Volume I: School Foodservice, School Food Environment, and Meals Offered and Served,” by Anne Gordon, Mary Kay Crepinsek, Renee Nogales and Elizabeth Condon. Project Officer: Patricia McKinney, Alexandria, VA: 2007.
- ⁹ FNS implemented new regulations to address this requirement, effective July, 2011. Available at [www.fns.usda.gov/cnd/Governance/Legislation/Pricing_Equity_Facts.pdf]. Accessed July 2, 2012.
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- ¹⁸ Institute of Medicine. *School Meals: Building Blocks for Healthy Children*. Washington, DC: The National Academies Press, 2010.
- ¹⁹ All references to SY 1998–1999 are based on SNDA-II and all references to SY 2004–2005 are based on SNDA-III. Complete references for these reports are shown below:
- U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation, “School Nutrition Dietary Assessment Study-II: Final Report” by Mary Kay Fox, Mary Kay Crepinsek, Patty Connor, and Michael Battaglia. Project Officer: Patricia McKinney. Alexandria, VA: 2001.
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- ²⁰ The analysis of food sources of solid fats, added sugars, and SoFAS calories was done only for lunches *offered*.
- ²¹ All references to SY 1998–1999 are based on SNDA-II and all references to SY 2004–2005 are based on SNDA-III. Complete references for these reports are shown below:
- U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation, “School Nutrition Dietary Assessment Study-II: Final Report” by Mary Kay Fox, Mary Kay Crepinsek, Patty Connor, and Michael Battaglia. Project Officer: Patricia McKinney. Alexandria, VA: 2001.
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Endnotes (continued)

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²³ Fox, M.K., A. Gordon, A. Wilson, and R. Nogales. “Availability of Competitive Foods in U.S. Public Schools.” *Journal of the American Dietetic Association*, vol. 109, suppl. 2, 2009: pp. S57–S66; Lanningham-Foster, L., S.K. McCrady, R.C. Foster, C. Manohar, T.B. Jensen, N.G. Mitre, J.O. Hill, and J.A. Levine. “Changing the School Environment to Increase Physical Activity in Children.” *Obesity*, vol. 16, no. 8, 2008: pp.1849-1853.

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²⁶ The survey did not collect information about the source of the ban or restriction. Some districts may have been implementing bans or restrictions that were mandated by State policy.

²⁷ Because of the small number of elementary schools with vending machines, these data were not tabulated for elementary schools.

²⁸ All references to SY 2004–2005 are based on SNDA-III. The complete reference for this report is: U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition, and Analysis, “School Nutrition Dietary Assessment Study-III: Volume I: School Foodservice, School Food Environment, and Meals Offered and Served,” by Anne Gordon, Mary Kay Crepinsek, Renee Nogales and Elizabeth Condon. Project Officer: Patricia McKinney, Alexandria, VA: 2007.

²⁹ Statistics reported in this section consider only data from principal surveys and vending machine checklists, the two sources for which conclusions differed about changes in the availability of vending machines between SY 2004–2005 and SY 2009–2010. Statistics on the prevalence of vending machines in SY 2009–2010 reported elsewhere in this report and in Volume 1, Chapter 3 of the SNDA-IV final report differ slightly and are based on responses from all study instruments, including FSM surveys.

³⁰ In July 2012, the HUSSC criteria were updated to reflect the 2010 *Dietary Guidelines*. The schools included in the HUSSC substudy qualified under the somewhat less stringent set of criteria in effect during SY 2009–2010. Details about these criteria are provided in Volume I, Appendix L of the SNDA-IV final report.

United States Department of Agriculture

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3101 Park Center Drive

Alexandria, VA 22302

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