School Nutrition Dietary Assessment Study-II

SUMMARY OF FINDINGS

April 2001

USDA

United States Department of Agriculture
Food and Nutrition Service
April 2001
Special Nutrition Programs
Report No. CN-01-SNDAII

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This study was conducted under Contract number 53-3198-05-032 with the Food and Nutrition Service.

This report is available on the Food and Nutrition Service web site: http://www.fns.usda.gov/oane.

SUGGESTED CITATION:
U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation, School Nutrition Dietary Assessment Study-II Summary of Findings. Mary Kay Fox, Mary Kay Crepinsek, Patty Connor, Michael Battaglia. Project Officer, Patricia McKinney. Alexandria, VA: 2001.

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Summary of Findings

This report summarizes findings of the second *School Nutrition Dietary Assessment Study* (SNDA-II). The study provides up-to-date information on the nutritional quality of meals served in public schools that participate in the National School Lunch Program (NSLP) and the School Breakfast Program (SBP). The last nationally representative study of the NSLP and SBP, SNDA-I, was completed in school year (SY) 1991-92. SNDA-I confirmed that school meals met a variety of important nutrition goals. However, the study also found that school lunches were not consistent with *Dietary Guidelines for Americans* recommendations for total fat and saturated fat intake. At the time, school food service programs were not required to offer meals that were consistent with the *Dietary Guidelines*.

Shortly after SNDA-I was published, USDA began work on an initiative to promote consistency with the *Dietary Guidelines* in the school meals programs. In 1995, the Department launched the School Meals Initiative for Healthy Children (SMI). SMI is designed to improve the nutritional quality of school meals by providing schools with educational and technical resources that can be used to assist food service personnel in preparing nutritious and appealing meals and to encourage children to eat more healthful meals.

Key components of SMI include new nutrition standards for school meals and added flexibility in the procedures used to plan and monitor school menus. The new nutrition standards maintain long-standing goals of providing one-third (lunches) and one-fourth (breakfasts) of students' daily needs for calories and key nutrients. In addition, the standards include goals for fat and saturated fat content that are consistent with *Dietary Guidelines* recommendations.

Data from the SNDA-II study provide information on how schools are progressing, in the early stages of SMI, toward meeting USDA's strategic goal of satisfying the SMI nutrition standards by the year 2005. The picture painted by the available evidence is a strong and positive one. In SY 1998-99, when SNDA-II data were collected, breakfasts served in the SBP were already meeting most of the SMI standards. Although there is still work to be done on NSLP meals, schools have made substantial improvements in the nutritional quality of the lunches they are providing and are making good progress toward meeting the SMI standards.

Key findings are summarized below.

- Between SY 1991-92 and SY 1998-99, there was a meaningful and statistically significant trend toward lower levels of fat and saturated fat and increased levels of carbohydrate in the lunches offered to students, relative to calorie content.

- In addition to improvement in overall means, there was a marked increase in the percentage of individual schools that offered lunches that were consistent with *Dietary Guidelines* recommendations for fat and saturated fat (now the SMI standards).

- Program regulations require that the meals selected by (served to) students — not just the meals offered to them — be consistent with SMI standards. Elementary schools are doing somewhat better than secondary schools at meeting this goal. In SY 1998-99, lunches served to students in elementary schools provided, on average, about 33 percent of calories from fat (compared to the SMI standard of no more than 30 percent) and about 12 percent of calories from saturated fat (compared to the standard of less than 10 percent). More than one in five elementary schools met the SMI standard for calories from fat and roughly one in seven met the SMI standard for calories from saturated fat.

- By comparison, the average lunch served in secondary schools in SY 1998-99 provided about 35 percent of calories from fat and 12 percent of calories from saturated fat. One in seven secondary schools met the SMI standard for calories from fat; roughly the same percentage met the standard for saturated fat.

- Even when the average lunch served to students did not meet SMI standards for calories from fat and saturated fat, many schools offered options that were consistent with these standards. Students in 82 percent of elementary schools and 91 percent of secondary schools had the opportunity to select lunches that were consistent with SMI standards for fat and saturated fat.

- Improvements in fat and saturated fat content were achieved without compromising the overall nutrient contribution of school lunches. Lunches served to students in SY 1998-99 provided more than one-third of the Recommended Dietary Allowances (RDAs) for all targeted nutrients. Only lunches served in secondary schools, where students' calorie needs are greatest, fell short of providing one-third of the recommended level of calories.

- School breakfasts have shown comparable improvements in relative fat and saturated fat content since SY 1991-92. In both elementary and secondary schools, the relative fat content of the average breakfast served in SY 1998-99 was consistent with the SMI standard for calories from fat and came very close to meeting the SMI standard for calories from saturated fat. These improvements came at no cost to the overall nutrient content of school breakfasts. Breakfasts served in SY 1998-99, in both elementary and secondary schools, provided one-fourth or more of the RDA for all targeted nutrients. As was the case in SY 1991-92, however, school breakfasts fell short of providing one-fourth of the recommended level of calories.

Background

The National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). Currently, the NSLP operates in more than 84,000 public schools and 12,000 private nonprofit schools and residential child care institutions. On any given day, more than 27 million children receive NSLP lunches. More than half of these lunches are provided free of charge or at a reduced price to children from low-income families. The SBP operates in approximately three-quarters of the schools that offer the NSLP, most commonly in schools that serve large numbers of economically disadvantaged children. On an average day, roughly seven million children receive breakfast through the SBP. More than three-quarters of these meals are provided free of charge.

Meals served in the NSLP and SBP must meet defined nutrition standards in order to be eligible for Federal subsidies (cash reimbursements and donated commodities). Program regulations have always included food-based menu planning guidelines designed to ensure that lunches and breakfasts are nutritionally well-balanced and make meaningful contributions to children's daily nutrient needs. Historically, the NSLP and SBP have been successful in meeting these goals. However, the first *School Nutrition Dietary Assessment Study* (SNDA-I) found that, in school year (SY) 1991-92, school lunches were not consistent with newer goals for total fat and saturated fat intake specified in the 1990 *Dietary Guidelines for Americans*. At the time, school food service programs were not required to meet the *Dietary Guidelines*.

The School Meals Initiative for Healthy Children

Shortly after SNDA-I revealed that school lunches were not consistent with the *Dietary Guidelines*, USDA began developing an initiative to address this problem. A series of public hearings was held and interested parties were invited to submit written comments. In 1995, the Department launched the School Meals Initiative for Healthy Children (SMI). SMI is designed to improve the nutritional quality of school meals by providing schools with educational and technical resources that can be used to assist food service personnel in preparing nutritious and appealing meals and to encourage children to eat more healthful meals.

Key components of SMI include new nutrition standards for school meals and added flexibility in the procedures used to plan and monitor school menus. The new nutrition standards maintain the long-standing goals of providing one-third (lunches) and one-fourth (breakfasts) of students' daily needs for calories and key nutrients. In addition, the standards include goals for fat and saturated fat content that are consistent with *Dietary Guidelines* recommendations.

The Second School Nutrition Dietary Assessment Study (SNDA-II)

In SY 1998-99, FNS sponsored the second *School Nutrition Dietary Assessment Study* (SNDA-II) to provide information on how schools are progressing, in the early stages of SMI, toward meeting the SMI standards. The study also provides current information about menu planning practices used in school food service programs and about related program operations issues.

The study focused exclusively on public schools, which account for roughly 90 percent of all institutional NSLP participants. Data were collected from nationally representative samples of public school food authorities (SFAs) and public schools participating in the NSLP. A total of 430 public SFAs and more than 1,000 public schools participated in the study. Results are generalizable to public SFAs and public schools nationwide but not to the entire NSLP. For ease in presentation, the unrestricted terms "school" and "SFA" are used throughout this report in exhibit titles and most text discussions. Selected section titles and discussions remind the reader that the study focused on public schools.

Two sets of standards were used to evaluate the nutrient content of NSLP and SBP meals (Exhibit 1). The first set is comprised of SMI nutrition standards, as defined in current NSLP and SBP regulations. A second set of standards, based on recommendations in the National Research Council's (NRC) *Diet and Health* report, was defined for nutrients and food components that are not quantified in SMI nutrition standards. *It is important to recognize that schools are not required to meet these additional standards. They are used in this report solely to facilitate understanding of the data.*

Exhibit 1

Nutrition Standards Used in Evaluating School Meals

NUTRIENT	STANDARD
Nutrition Standards Defined in NSLP and SBP Regulations	
Nutrients with established Recommended Dietary Allowances (RDAs):	
Calories, protein, vitamin A, vitamin C, calcium, and iron	**Breakfast:** One-fourth of the RDA
	Lunch: One-third of the RDA
Nutrients included in the *Dietary Guidelines for Americans*:	
	Breakfast and Lunch:
Total fat	≤30% of total calories
Saturated fat	<10% of total calories
National Research Council *Diet and Health* Recommendations	
Carbohydrate	**Breakfast and Lunch:** >55% of total calories
Cholesterol	**Breakfast:** ≤75 mg
	Lunch: ≤100 mg
Sodium	**Breakfast:** ≤600 mg
	Lunch: ≤800 mg

Note: Recommendations for cholesterol and sodium are equivalent to one-third (lunch) and one-fourth (breakfast) of the recommended maximum daily intake.

Menu Planning Practices in School Year 1998-99

Current program regulations provide schools with five different menu planning options: (1) the traditional food-based menu planning system; (2) an enhanced food-based menu system; (3) a computer-based menu planning system known as Nutrient Standard Menu Planning (NSMP); (4) Assisted Nutrient Standard Menu Planning (ANSMP), which allows a school district to arrange or contract for computerized menu planning through an external source; and (5) any other reasonable approach. Other reasonable approaches may include specific modifications (outlined in program regulations) to the food-based menu planning guidelines as well as more major modifications to any of the available menu planning systems. State agencies may establish guidelines for using a modified approach to menu planning and may require that SFAs receive prior approval before implementing such a system.

The traditional food-based menu planning system requires that lunches offered to students include five food items: fluid milk (as a beverage), one serving of meat or meat alternate, a minimum of one serving of a bread or grain product, and two servings of fruit and/or vegetables. The system also defines minimum required portion sizes for children in different grades. The enhanced food-based menu system is very similar to the traditional food-based system but requires more servings of bread and grain products over the course of a week and larger servings of fruits and vegetables.

NSMP and ANSMP require use of a computerized nutrient analysis system to plan menus. SFAs must select one of several USDA-approved NSMP software programs. The only food-based menu planning requirements imposed under NSMP or ANSMP are that milk be offered as a beverage and that at least one entree and one side dish be offered. Within these broad guidelines, menu planners are free to use whatever portions and combinations of food they wish in order to meet the nutrition standards.

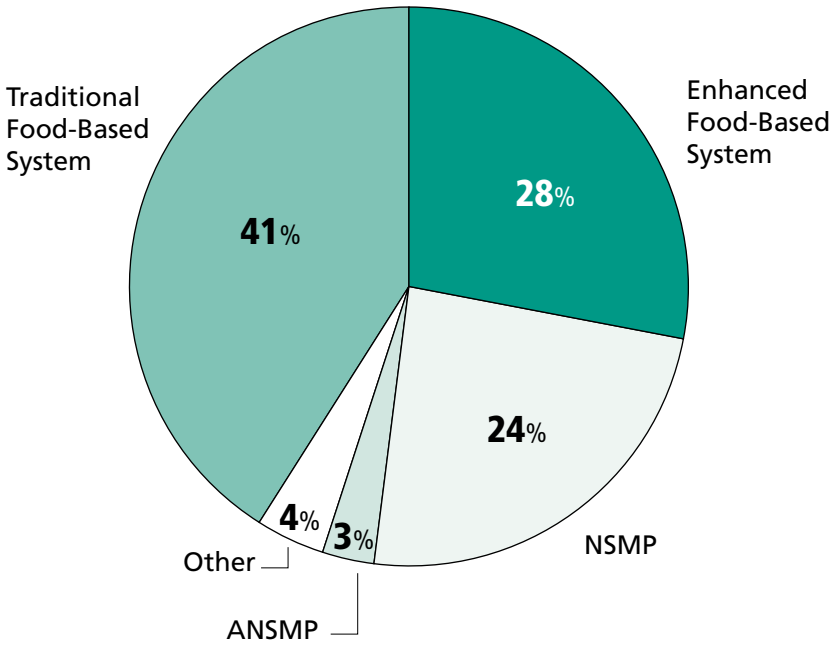
In SY 1998-99, more than two-thirds of all schools used one of the two food-based menu planning options (Exhibit 2). Sixty-nine percent of all schools used one of the two food-based menu planning options. Forty-one percent of schools used the traditional food-based menu planning system and another 28 percent used the enhanced food-based system. The nutrient-based menu planning options were used by 27 percent of all schools (24% NSMP and 3% ANSMP). A small proportion of schools (4%) reported using an alternative approach to menu planning.

Choice of menu planning system varied by region. Compared to the national distribution of menu planning systems, use of NSMP/ANSMP was disproportionately higher and use of the traditional food-based menu planning system was disproportionately lower in the Mountain Plains and Western regions. In contrast, schools in the Southwest region overwhelmingly used the traditional food-based system.

Exhibit 2

More than Two-Thirds of All Schools Used One of the Two Food-Based Menu Planning Options

Percentage of Schools



Choice of menu planning system varied somewhat by type of community. Among urban schools, use of NSMP and ANSMP was higher than the national average. The same was true of the enhanced food-based system among suburban schools. Use of the enhanced food-based system was disproportionately lower among rural schools.

Choice of menu planning system varied by the proportion of low-income children in a school. Use of the traditional food-based menu planning system was disproportionately higher and use of NSMP/ANSMP was disproportionately lower among schools with the highest proportion of low-income students — those with 75 percent or more of students approved for free meal benefits. Schools in the most affluent communities — those with no more than 25 percent of students approved for free meals — used the enhanced food-based menu system more frequently than schools with greater concentrations of low-income students.

Menu Planning Resources

In about half of all schools, some type of computerized nutrient analysis system was used to assess the nutrient content of planned menus. Menu planners in two-thirds of all schools reported having access to a computer-based system for menu planning. Menu planners in half of all schools actually used such a system to analyze the nutrient content of menus. The nutrient analysis software used in non-NSMP/ANSMP schools may or may not have been one of the USDA-approved systems eligible for use with NSMP.

More than half of all schools used a trained nutritionist or registered dietitian to plan menus. Thirty-one percent of schools used a nutritionist who was not a registered dietitian; 15 percent used a registered dietitian; and 12 percent used both types of nutrition professionals.

Incorporating the *Dietary Guidelines for Americans*

As of SY 1998-99, most schools had implemented changes in lunch menus to make them more consistent with the *Dietary Guidelines* for calories from fat and saturated fat. Managers in most of these schools reported that changes had neutral or positive effects on the acceptability of school lunches. Managers in 43 percent of schools where changes had been implemented reported that students liked the new lunches *about the same as* the old lunches. A roughly equivalent proportion (38%) indicated that students liked the new lunches *somewhat better* or *much better* than the old lunches. Only 14 percent of managers reported that changes made to incorporate the *Dietary Guidelines* had a negative impact on meal acceptability.

The general pattern of responses was comparable across school types. However, compared to elementary school and middle school managers, fewer high school managers reported a positive impact (35% vs. 39-40%) and more high school managers reported neutral or negative impacts (61% vs. 55-56%).

Alternatives to NSLP and SBP Meals

Students have access to a variety of breakfast and lunch options other than NSLP and SBP meals. In addition to bringing food from home or, in the case of the SBP, choosing to eat breakfast at home, options include purchasing components of the USDA-reimbursable meal or other foods not offered in reimbursable meals on an *a la carte* basis; buying food from a school store, snack bar, or vending machine; and, for lunch, leaving school to eat elsewhere.

***A la carte* foods were the most common alternative to a USDA-reimbursable meal.** More than nine out of ten schools made beverages or foods available for *a la carte* purchase at lunch time. *A la carte* programs tended to be most extensive in middle schools and high schools and often made it possible for students to purchase meals entirely *a la carte*. In contrast, more than one-third of elementary schools limited *a la carte* offerings to items that may accompany meals brought from home, e.g., milk only (28%) or milk and juice and/or desserts (11%).

***A la carte* foods were available more often at lunch than at breakfast.** Students were less likely to have the option to purchase *a la carte* foods at breakfast. At the elementary school level, only 27 percent of schools offered *a la carte* foods at breakfast, compared to 90 percent at lunch. Forty-eight percent of middle schools and 60 percent of high schools offered *a la carte* foods at breakfast, compared to more than 90 percent at lunch.

***A la carte* sales provided revenue for school food service programs.** During a typical week in SY 1998-99, *a la carte* sales in public NSLP schools generated an average of $913 per 1,000 students. Average weekly *a la carte* revenue for elementary schools ($375 per 1,000 students) was about one-fifth that of middle schools ($1,760) and high schools ($1,985).

Weekly *a la carte* revenue was inversely related to overall NSLP participation rates. (Exhibit 3). Schools with the highest levels of NSLP participation reported the least *a la carte* revenue and schools with the lowest levels of NSLP participation reported the most *a la carte* revenue. The negative relationship between NSLP participation and weekly *a la carte* revenue was apparent for all types of schools.

Vending machines provided another alternative source of food and beverages in one-third of all schools. Vending machines were more prevalent in middle schools (55%) and high schools (76%) than in elementary schools (15%). Roughly a quarter of all schools had vending machines located in or near the cafeteria.

Middle schools, and high schools in particular, were more likely than elementary schools to offer other types of meal alternatives. High schools (41%) and middle schools (35%) were more likely than elementary schools (9%) to offer food or beverages through school stores, snack bars, or canteens. The availability of an open campus policy at lunch (the ability to leave school grounds) was more common in high schools (29%) than in either elementary schools (8%) or middle schools (6%).

Exhibit 3

NSLP Student Participation Rates Were Inversely Related to Weekly *a la Carte* Revenue

Overall Student Participation Rate	Average Weekly *a la Carte* Revenue per 1,000 Students
Elementary Schools	
Less than 57%	$456
57 - 70%	491
71 - 81%	280
82 - 100%	367
Middle Schools	
Less than 38%	$2,894
38 - 55%	1,929
56 - 71%	1,150
72 - 100%	826
High Schools	
Less than 21%	$2,422
21 - 35%	2,346
36 - 54%	2,218
55 - 100%	1,031
All Schools	
Less than 36%	$2,135
36 - 55%	1,141
56 - 72%	682
73 - 100%	383

Note: Based on distribution of participation rates, by quartile, for each school type.

Characteristics of Lunches Served in Public NSLP Schools

On a typical day in SY 1998-99, approximately 60 percent of all students in public NSLP schools participated in the program. Participation varied by type of school, with participation being highest in elementary schools — 67 percent, on average — and lowest in high schools (39%). Students approved to receive free meals participated at a higher rate (80%) than either students approved to receive reduced-price meals (69%) or students who paid full price (48%).

In SY 1998-99, the average price for a reduced-price lunch was $0.38 in elementary schools, middle schools, and high schools. (Federal regulations set the maximum price for a reduced-price lunch at $0.40). The average price for a standard full-price lunch was $1.30 in elementary schools and $1.44 in middle schools and high schools. Eight percent of schools offered full-price lunches at a price higher than the standard price and six percent offered full-price lunches at a lower price. Higher prices were most often used for larger portions or special menu items. Lower prices were associated with use of monthly or weekly purchase discounts.

Schools offered a variety of food choices in NSLP meals. More than 95 percent of all NSLP menus included two or more types of milk. Almost three-quarters of all menus offered a choice of entree. Forty percent of all menus included two or three entree choices; 18 percent included four or five choices; and 14 percent included six or more options. A choice of entree was more common in secondary (middle and high) schools than in elementary schools. More than one-third of elementary school menus were limited to one entree compared to 15 percent of secondary school menus.

Roughly two-thirds of all NSLP menus offered more than the two fruit and vegetable choices required under the food-based menu planning options. More than one-quarter of all menus included five or more fruit and vegetable choices. The availability of choice among fruits and vegetables and the number of options offered were both greater in secondary school menus than in elementary school menus.

Desserts are not required under any menu planning option. However, 36 percent of all NSLP menus included one or more desserts.

Students did not always take a serving of every type of food offered to them. Milk is offered in every NSLP menu. However, on an average day, 16 percent of lunches selected by students in secondary schools did not include milk. The practice of omitting milk was less common in elementary schools; on average, about six percent of lunches selected by elementary school students did not include milk. When an additional bread or grain product was offered (other than those included in combination entrees or offered with other specific menu items), these items were omitted in more than a third of the lunches served in secondary schools and about a quarter of the lunches served in elementary schools. The greater prevalence of omitted menu items in secondary schools may be influenced by the fact that senior high schools are required to implement the Offer-versus-Serve (OVS) provision which allows students to refuse items that are offered to them. Greater availability and scope of *a la carte* programs may also affect selection patterns of secondary school students.

Overall, NSLP lunches served to students in SY 1998-99 satisfied program standards for calories and RDA nutrients but did not satisfy standards for calories from fat or saturated fat (Exhibit 4). The overall pattern of findings was similar for elementary schools and secondary schools. However, there were important differences between the two types of schools. The discussions that follow compare and contrast results for elementary and secondary schools.

Exhibit 4

Mean Nutrient Profile of Lunches Served in SY 1998-99, by School Type, Compared to NSLP Nutrition Standards and NRC Recommendations

	STANDARD/ RECOMMENDATION	ELEMENTARY SCHOOLS	SECONDARY SCHOOLS	ALL SCHOOLS
Mean Percent of RDA				
Total calories	33%	35%	30%	33%
Protein	33%	105	64	91
Vitamin A	33%	67	43	59
Vitamin C	33%	59	54	58
Calcium	33%	58	40	52
Iron	33%	44	35	41
Mean Percent of Calories from				
Total Fat	≤30%	33.1%	34.5%	33.6%
Saturated Fat	<10%	11.9	12.1	12.0
Carbohydrate	>55%[1]	51.4	50.0	50.9
Mean Amount				
Cholesterol (mg)	≤100[1]	65	68	66
Sodium (mg)	≤800[1]	1,259	1,382	1,303

[1] NRC recommendation, not NSLP standard.

As served, NSLP lunches provided more than one-third of the RDA, except for calories in secondary schools (Exhibit 5). For all key nutrients, the average NSLP lunch served to students in SY 1998-99 exceeded the program standard of one-third of the RDA. Secondary school lunches fell short of the one-third RDA standard for calories, providing an average of 30 percent of the RDA.

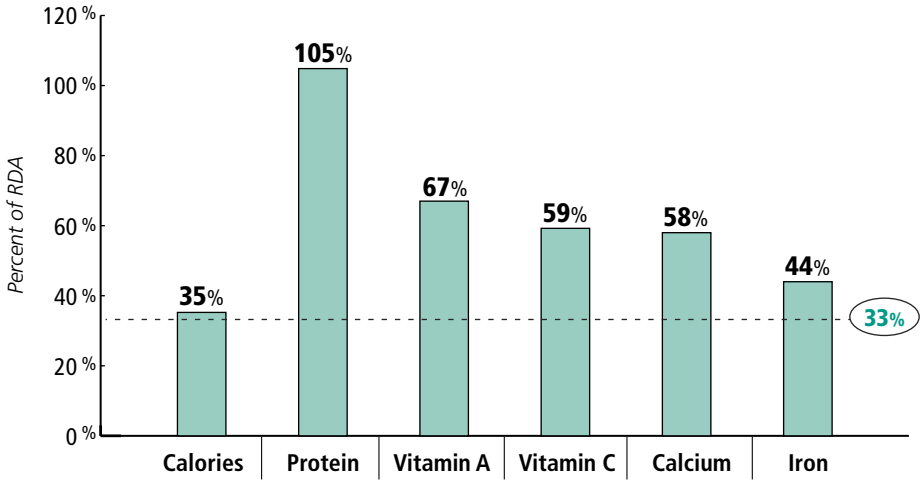
Almost 70 percent of elementary schools served lunches that met the one-third RDA standard for calories while only 20 percent of secondary schools did so. The sharp difference between elementary schools and secondary schools is likely attributable to both the greater calorie needs of older students and the fact, as discussed above, that secondary school students were more likely than elementary school students to omit components of the offered NSLP meal.

The levels of fat and saturated fat in NSLP lunches exceeded program standards (Exhibit 6). On average, lunches served in elementary schools provided 33 percent of calories from fat and lunches served in secondary schools provided 35 percent of calories from fat (compared to the standard of no more than 30%). Lunches served in both elementary schools and secondary schools averaged 12 percent of calories from saturated fat (compared to the standard of less than 10%).

Exhibit 5

Lunches Served to Students in SY 1998-99 Provided More than One-Third of the RDA, With the Exception of Calories in Secondary Schools

Elementary School Lunches



Secondary School Lunches

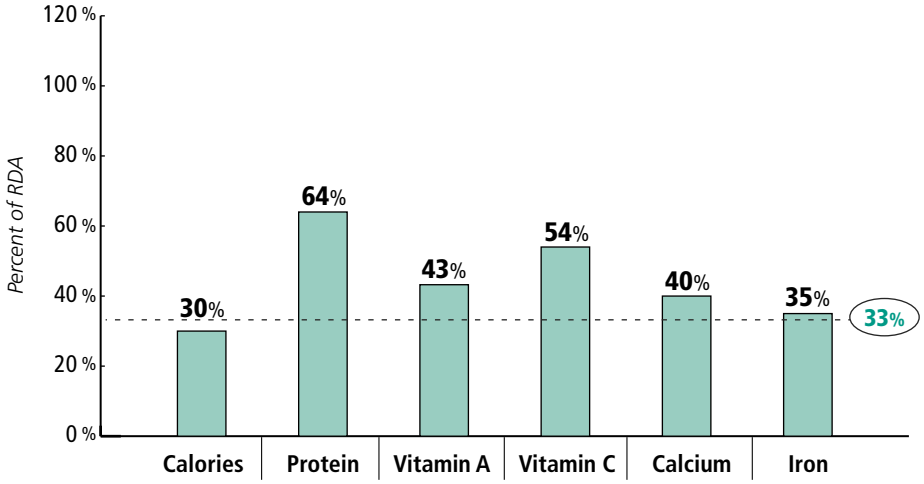
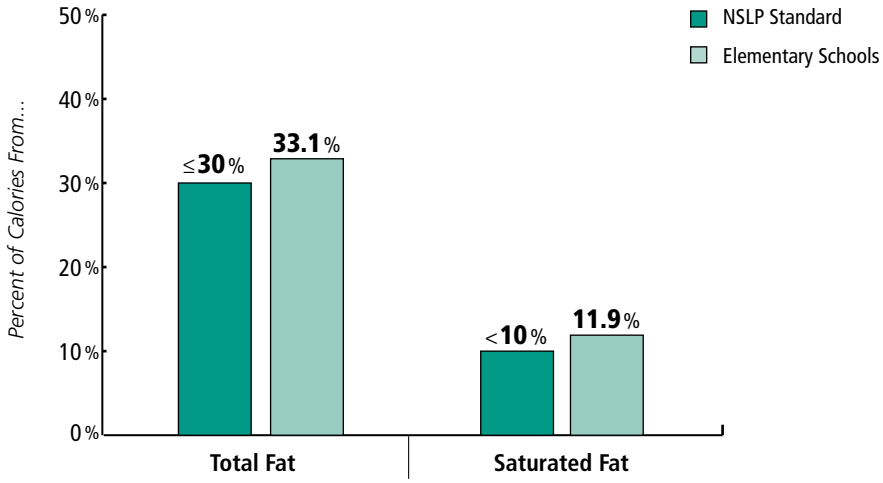


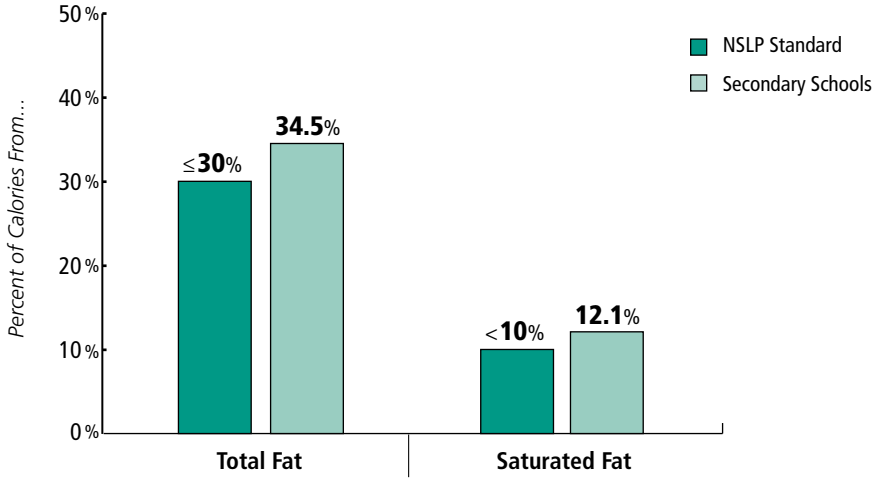
Exhibit 6

Lunches Served to Students in SY 1998-99 Did Not Meet NSLP Standards for Calories From Fat and Saturated Fat

Elementary School Lunches



Secondary School Lunches



Some individual schools did meet program standards for total fat and saturated fat (Exhibit 7). The average lunch served in 21 percent of elementary schools and 14 percent of secondary schools met the NSLP standard for calories from fat. The average lunch served in 15 percent of elementary schools and 13 percent of secondary schools met the program standard for calories from saturated fat.

NSLP lunches met the NRC recommendation for cholesterol but did not meet NRC recommendations for sodium or for calories from carbohydrate (Exhibit 8). The average cholesterol content of lunches served in elementary and secondary schools was 65 mg and 68 mg, respectively, which is less than one-third of the recommended maximum daily intake of 300 mg. Average lunches served in 98 percent of all schools met the recommendation for cholesterol content.

In contrast, mean sodium content of NSLP lunches exceeded the NRC recommendation of no more than 800 mg (one-third of the recommended maximum daily intake of 2,400 mg) by 57 percent (elementary schools) to 73 percent (secondary schools). Overall, lunches served in about one percent of all schools were consistent with the NRC recommendation for sodium. Almost all of the schools that met this recommendation were elementary schools.

Finally, lunches served in both elementary schools and secondary schools were low in calories from carbohydrate, relative to the NRC recommendation of more than 55 percent of total calories. This is not unexpected given the percentage of calories provided by fat — it is difficult to meet the recommendation for calories from carbohydrate without meeting the standard for calories from fat. Only 18 percent of elementary schools and 14 percent of secondary schools met the recommendation for calories from carbohydrate.

There were no meaningful differences in the average nutrient content of lunches served in schools that used different menu planning options. Although there were scattered differences in the mean nutrient content of lunches served in schools using different menu planning options, none of the differences affected conclusions about whether the average lunch served met NSLP standards or NRC recommendations. Among elementary schools, lunches served in NSMP/ANSMP schools provided a smaller percentage of the RDA for calories (34% vs. 36%) than lunches served in schools that used the traditional food-based menu planning system. In addition, lunches served in elementary schools that used the enhanced food-based menu planning system provided, on average, fewer calories from saturated fat than lunches served in schools that used the traditional food-based system (although both estimates rounded to 12 percent).

Among secondary schools, lunches served in schools that used the enhanced food-based menu planning system provided, on a percentage basis, fewer calories from fat (34% vs. 35%) and saturated fat (12% vs. 13%) and more calories from carbohydrate (51% vs. 49%) than lunches served in schools that used the traditional food-based menu planning system.

Exhibit 7

Lunches Served In Some Individual Schools Did Meet NSLP Standards for Calories from Fat and Saturated Fat

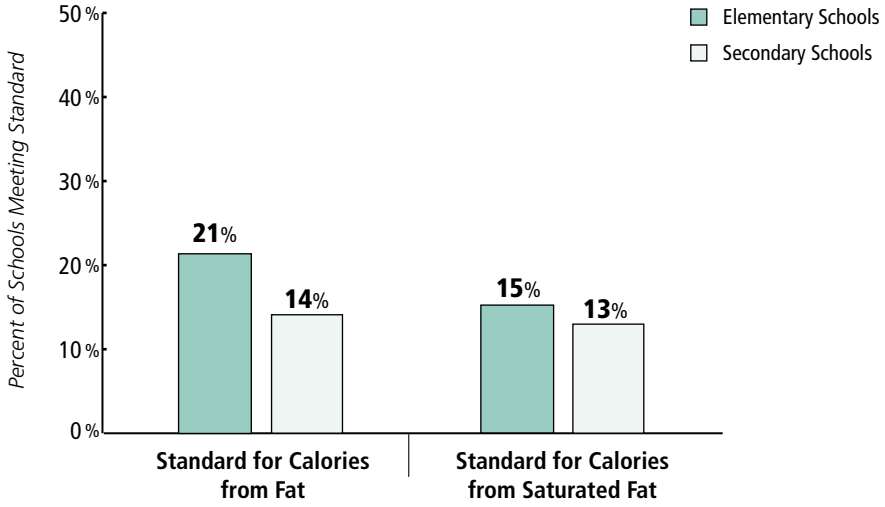
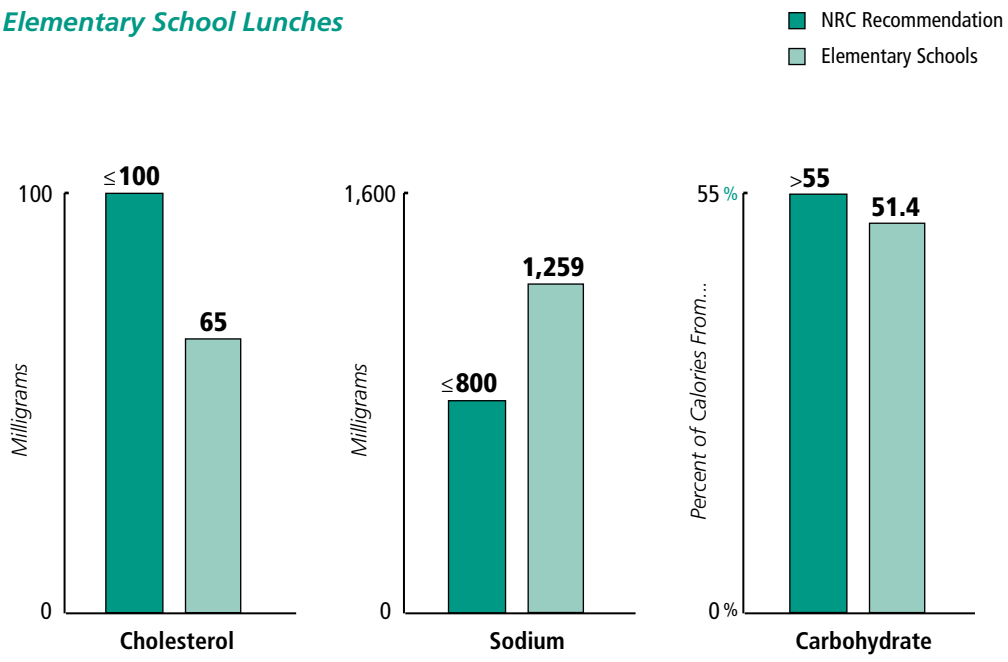


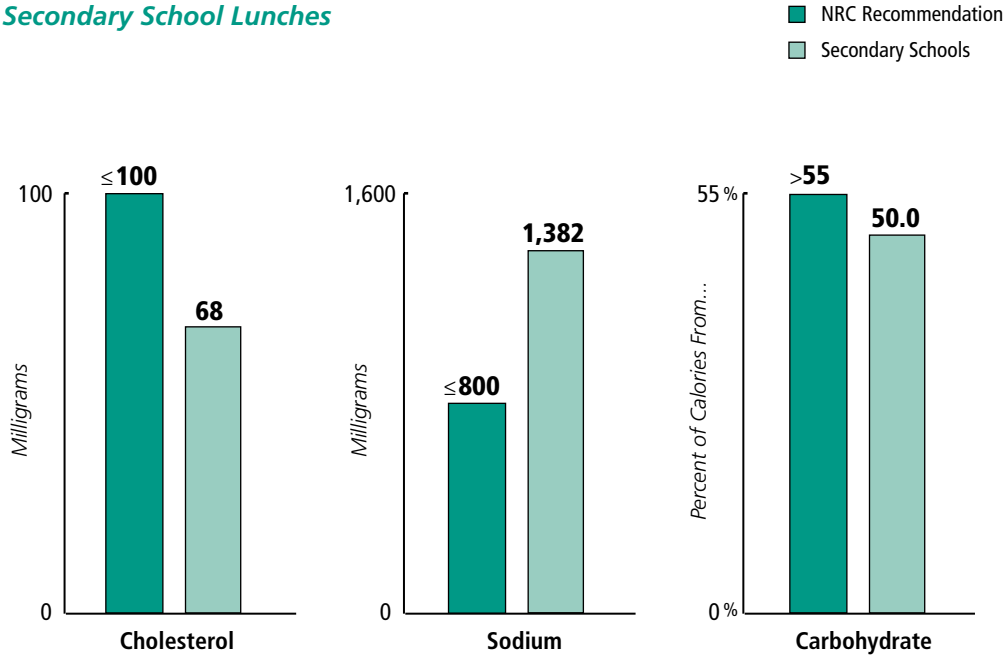
Exhibit 8

Lunches Served to Students Met the NRC Recommendation for Cholesterol but Did Not Meet Recommendations for Sodium or Calories From Carbohydrate

Elementary School Lunches



Secondary School Lunches



Characteristics of Breakfasts Served in Public NSLP Schools

In SY 1998-99, more than three-quarters of all public NSLP schools offered the SBP. Ten percent of NSLP schools offered a non-USDA breakfast program or morning snack program. These programs were most prevalent in high schools. Twenty percent of all NSLP schools offered neither a breakfast program nor a morning snack program.

On an average day, 22 percent of all students in SBP schools participated in the program. Participation varied by type of school, with participation being highest in elementary schools — 26 percent, on average — and lowest in high schools (11%). Students approved to receive free meals participated at a higher rate (39%) than either students approved to receive reduced-price meals (20%) or students who paid full price (8%).

In SY 1998-99, the average price for a reduced-price breakfast was approximately $0.28 in elementary schools, middle school, and high schools. (Federal regulations set the maximum price for a reduced-price breakfast at $0.30). The average price for a full-price breakfast was $0.70 in elementary schools, $0.76 in middle schools, and $0.75 in high schools. Very few schools (1%) used more than one price for full-price breakfasts.

Schools offered some choice in SBP meals. More than 80 percent of all daily SBP menus included two or more types of milk. (Fewer milk options were offered at breakfast than at lunch because fewer schools offered flavored milk at breakfast.) More than half of all SBP menus offered a choice of fruit, vegetable, or juice (more than one) and more than two-thirds offered more than one bread or grain product. Combination entrees (e.g., breakfast sandwiches consisting of an English muffin, biscuit, or bagel with an egg and cheese) were less common, appearing in only about a third of all breakfast menus. When combination entrees were included, generally only one such item was offered. Fewer than 30 percent of all breakfast menus offered meats or meat alternates other than those included in combination entrees.

Students did not always take a serving of every type of food offered to them. On an average day, approximately 14 percent of breakfasts selected by secondary school students and eight percent of breakfasts selected by elementary school students did not include milk. In addition, 12 percent of students who had an opportunity to include a serving of fruit, juice, or vegetables in their breakfasts did not do so.

Overall, SBP breakfasts served to students in SY 1998-99 satisfied most program standards and NRC recommendations (Exhibit 9). Although the overall pattern of findings was similar for elementary schools and secondary schools, there were important differences between the two types of schools. The discussions that follow compare and contrast results for elementary and secondary schools.

Exhibit 9

Mean Nutrient Profile of Breakfasts Served in SY 1998-99, by School Type, Compared to SBP Nutrition Standards and NRC Recommendations

	STANDARD/ RECOMMENDATION	ELEMENTARY SCHOOLS	SECONDARY SCHOOLS	ALL SCHOOLS
Mean Percent of RDA				
Total calories	25%	23%	20%	22%
Protein	25%	52	34	46
Vitamin A	25%	39	25	34
Vitamin C	25%	81	72	78
Calcium	25%	43	29	38
Iron	25%	37	28	34
Mean Percent of Calories from				
Total Fat	≤30%	26.5%	28.3%	27.1%
Saturated Fat	<10%	10.1	10.5	10.2
Carbohydrate	>55%[1]	61.5	59.2	60.7
Mean Amount				
Cholesterol (mg)	≤75[1]	43	55	47
Sodium (mg)	≤600[1]	574	672	607

[1] NRC recommendation, not SBP standard.

SBP breakfasts provided one-fourth or more of the RDA, with the exception of calories (Exhibit 10). On average, breakfasts served in SY 1998-99 to students in both elementary schools and secondary schools met or exceeded the one-fourth RDA standard for all key nutrients. SBP breakfasts were especially rich in vitamin C, providing, on average, more than 70 percent of the RDA. The average breakfast fell short of the one-fourth RDA standard for calories, however. Elementary school and secondary school breakfasts provided, respectively, an average of 23 percent and 20 percent of the RDA for calories.

Breakfasts served in more than 80 percent of all schools provided less than one-fourth of students' daily energy needs. The percentage of secondary schools in which the SBP standard for calories was satisfied (8%) was about a third that of elementary schools (22%). In addition, more elementary schools than secondary schools met the standards for calcium (99% vs. 78%), vitamin A (95% vs. 48%), and iron (93% vs. 57%). These differences are attributable to both differences in students' food selection patterns, as discussed above, as well as to older students' increased nutrient needs. For example, mean levels of vitamin A and iron were comparable in breakfasts served in elementary and secondary schools, however, RDAs for secondary school students are greater.

SBP breakfasts met the program standard for total fat and came close to meeting the standard for saturated fat (Exhibit 11). Breakfasts served to SBP participants provided between 27 percent (elementary schools) and 28 percent (secondary schools) of calories from fat, compared to the SBP standard of no more than 30 percent. Breakfasts provided roughly 10 percent of calories from saturated fat, compared to the standard of less than 10 percent.

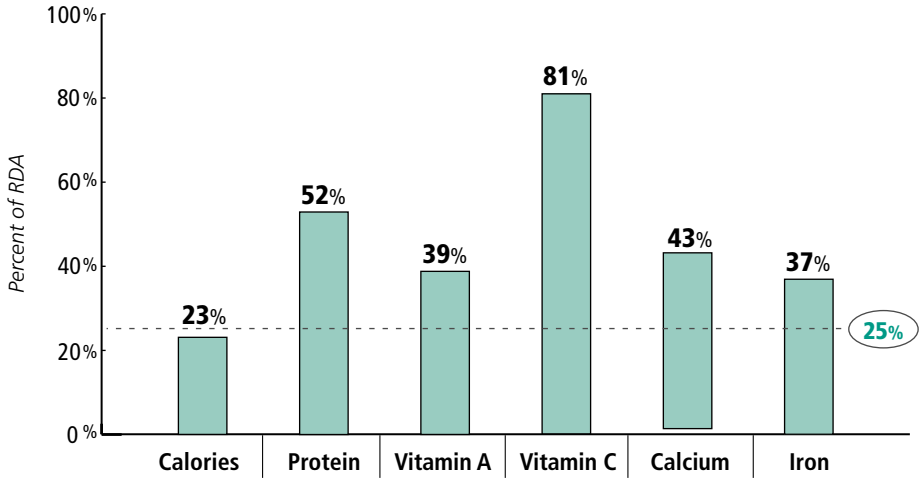
More than 70 percent of all schools met the SBP standard for total fat and more than half met the standard for saturated fat. The average breakfast served in 75 percent of elementary schools and 64 percent of secondary schools provided no more than 30 percent of calories from fat. Breakfasts served in 54 percent of elementary schools and 46 percent of secondary schools met the SBP standard for the percentage of calories from saturated fat.

SBP breakfasts met NRC recommendations for cholesterol and calories from carbohydrate. Breakfasts served in elementary schools also met the NRC recommendation for sodium (Exhibit 12). On average, breakfasts served in both elementary schools and secondary schools provided less than 75 mg of cholesterol (equivalent to one-fourth of the recommended maximum intake of 300 mg). Eighty-five percent of all schools met this standard. In addition, the average breakfast served in both elementary schools and secondary schools satisfied the NRC recommendation for calories from carbohydrate (62% and 59%, respectively, compared to the recommendation of more than 55%). Roughly eight out of ten schools met this standard. The average breakfast served in elementary schools

Exhibit 10

Breakfasts Served to Students in SY 1998-99 Provided at Least One-Fourth of the RDA, With the Exception of Calories

Elementary School Breakfasts



Secondary School Breakfasts

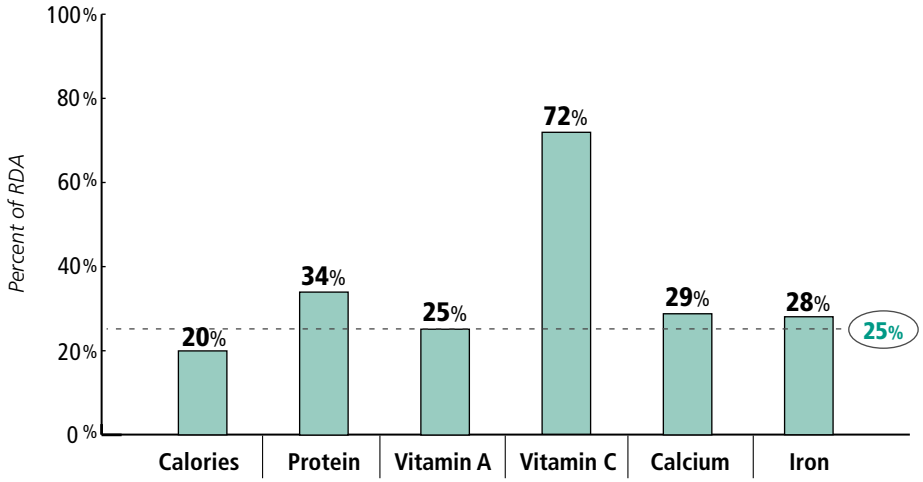
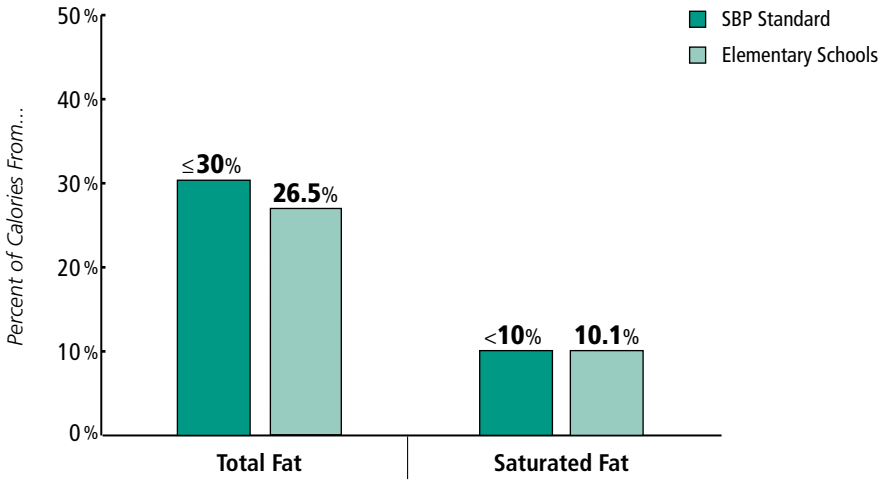


Exhibit 11

Breakfasts Served to Students in SY 1998-99 Met the SBP Standard for Calories From Fat and Almost Met the Standard for Calories From Saturated Fat

Elementary School Breakfasts



Secondary School Breakfasts

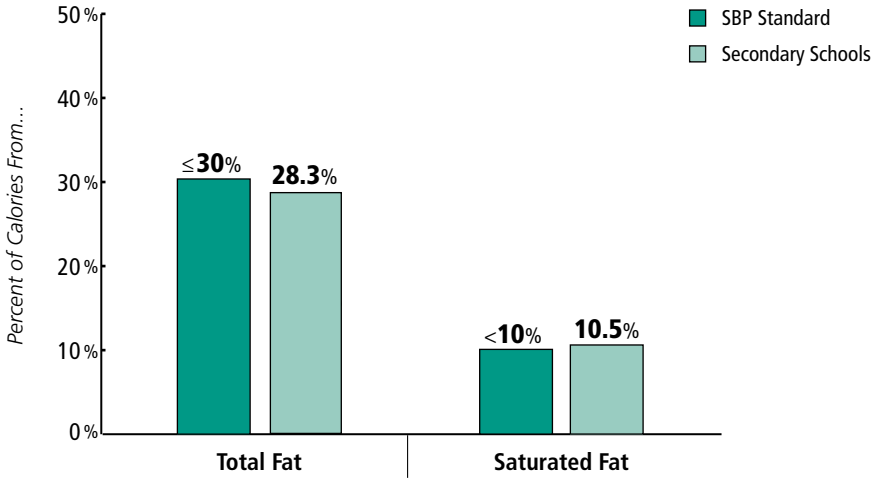
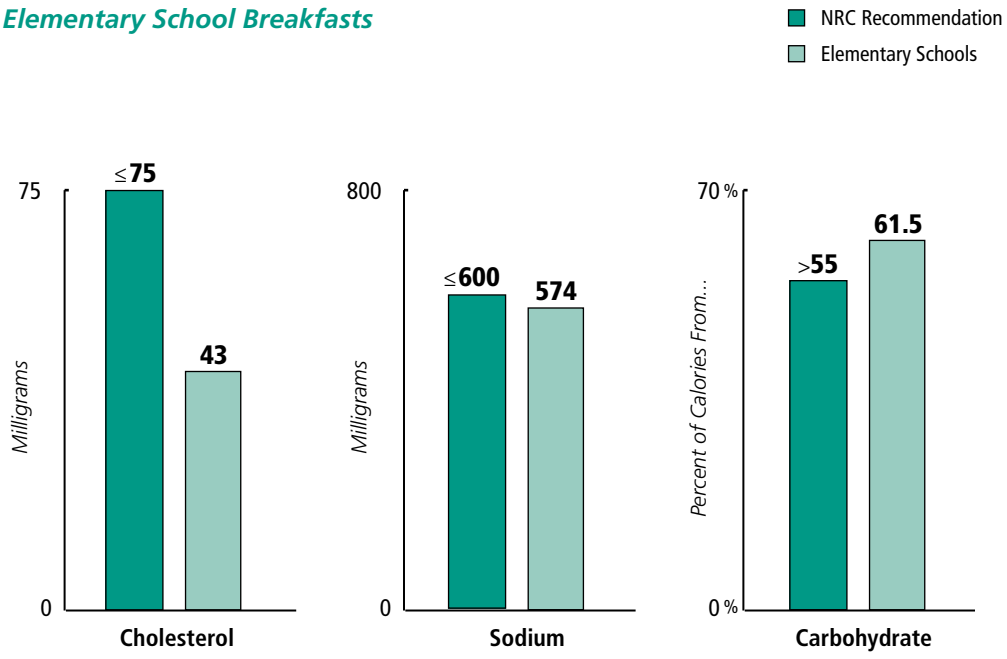


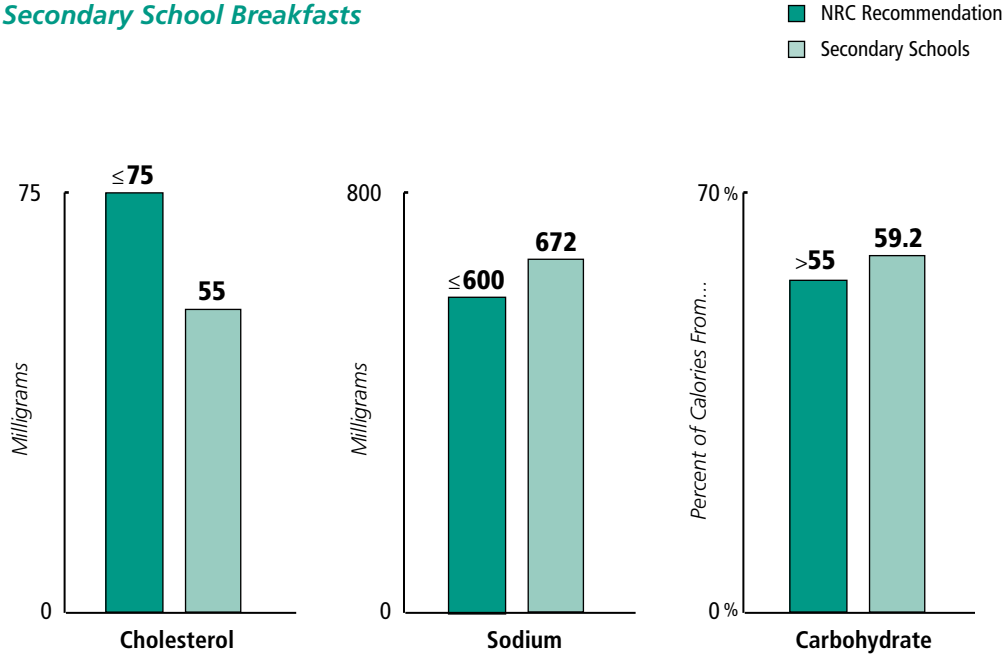
Exhibit 12

Breakfasts Served to Students Met NRC Recommendations for Cholesterol and Calories from Carbohydrate but Did Not Consistently Meet the Recommendation for Sodium

Elementary School Breakfasts



Secondary School Breakfasts



also satisfied the NRC recommendation for sodium (no more than 600 mg or one-fourth of the maximum recommended daily intake), however, the average breakfast served in secondary schools exceeded this benchmark. Sixty-three percent of elementary schools met the recommendation for sodium, compared to 42 percent of secondary schools.

Breakfasts served in schools that used NSMP/ANSMP derived significantly fewer calories from saturated fat than breakfasts served in schools that used the traditional food-based menu planning system. Breakfasts served in schools that used NSMP/ANSMP were consistent with the SBP standard of less than 10 percent of calories from saturated fat. In contrast, breakfasts served in schools that used the traditional food-based menu planning system derived roughly 11 percent of calories from saturated fat, a level which exceeds the SBP standard.

In comparison to breakfasts served in schools that used the traditional food-based menu planning system, NSMP/ANSMP schools also provided a smaller percentage of the RDA for calories (elementary schools only), a smaller percentage of calories from fat, a greater percentage of calories from carbohydrate (secondary schools only), and less sodium (elementary schools only). With two exceptions, however, breakfasts served in both groups of schools met most of the relevant standards. The first exception is that neither group of schools met the one-fourth RDA standard for calories. The other exception involves the sodium content of elementary school breakfasts. The average sodium content of breakfasts served in NSMP/ANSMP schools (528 mg) met the NRC recommendation of no more than 600 mg, while the average for schools that used the traditional food-based menu planning system (605 mg) was slightly higher than the recommended level.

Comparison of Weighted and Unweighted Nutrient Analyses *(Served Versus Offered)*

Current NSLP and SBP menu planning requirements and monitoring standards are built around use of a weighted nutrient analysis (although the CN Reauthorization Act of 1998 waived the requirement through SY 2003 for school districts that obtain a waiver). A *weighted* nutrient analysis incorporates information about student selection patterns and does not assume that every student takes one serving of every type of food offered. This approach provides a picture of the *average meal served* to or *selected* by students. In contrast, an *unweighted* nutrient analysis does not consider the relative frequency with which different types of food are served/selected. The analysis constitutes a simple average of all foods offered. An unweighted nutrient analysis provides a picture of the *average meal offered* to students. The principal difference between the two analytic approaches is that a weighted analysis reflects student choices, a factor which school food service programs may influence but can not control.

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NSLP Lunches

Estimates of the calorie and nutrient content of the average lunch were different for weighted and unweighted the analyses, but conclusions about the one-third RDA standard were similar (Exhibit 13). An unweighted nutrient analysis of school lunch menus resulted in greater estimated contributions to RDAs than a weighted analysis. However, with the exception of calories in secondary school lunches, both analyses indicated that lunches provided one-third or more of the RDA. Thus, whether the analysis was based on the average lunch served to students (weighted analysis) or the average lunch offered (unweighted analysis), school lunches in SY 1998-99 met the one-third RDA standard for calories (except secondary schools) and all key nutrients.

Conclusions about whether lunches met NSLP standards for total fat and saturated fat were identical for weighted and unweighted analyses (Exhibit 14). Among elementary schools, the two analyses resulted in virtually identical estimates of the percentage of calories provided by fat. Among secondary schools, the weighted analysis resulted in a slightly greater estimate of the percentage of calories provided by fat (35% vs. 34%). Weighted and unweighted estimates of the percentage of calories from saturated fat were identical for elementary schools. For secondary schools, the weighted analysis produced a slightly higher estimate, although both estimates rounded to 12 percent. Regardless of the analysis method used, the average school lunch in SY 1998-99 did not meet established nutrient standards for total fat or saturated fat.

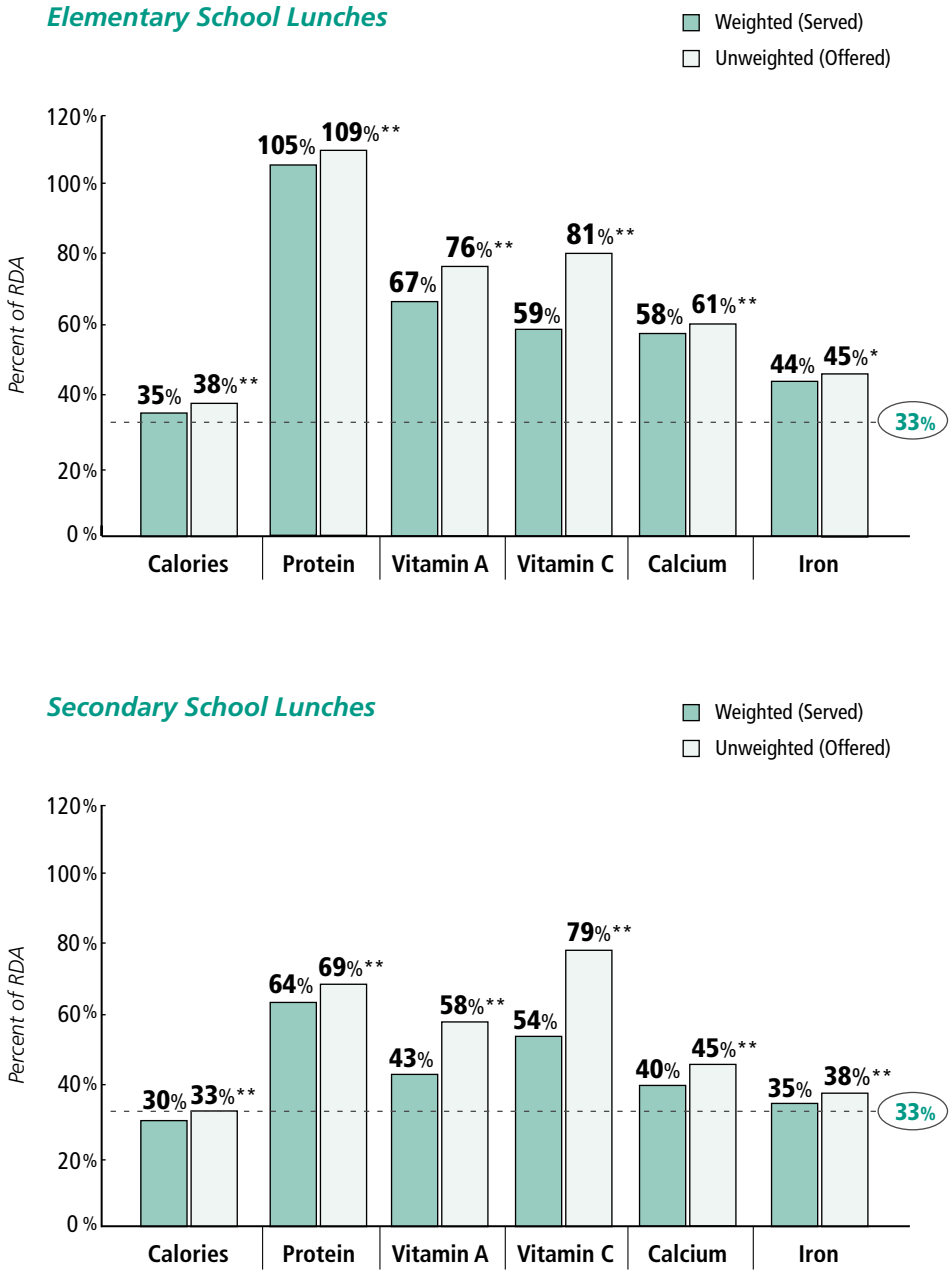
Conclusions about whether lunches met NRC recommendations for cholesterol, sodium, and calories from carbohydrate were identical for weighted and unweighted analyses (Exhibit 15). Both weighted and unweighted analyses indicated that the average lunch met the NRC recommendation for cholesterol but did not meet recommendations for sodium content or for calories from carbohydrate.

Conclusions about the percentage of individual schools that met NSLP standards or NRC recommendations varied for weighted and unweighted analyses. The percentage of schools that met the standard was almost always greater when an unweighted analysis was used and this effect was most pronounced among secondary schools (Exhibit 16). Among elementary schools, differences between the two analysis methods in the percentage of schools considered to have met NSLP standards or NRC recommendations were statistically significant only for calories and vitamin C. For both of these nutrition standards, the percentage of schools classified as having met the standard was greater when an unweighted analysis was used.

Among secondary schools, differences in the percentage of schools considered to have met NSLP standards or NRC recommendations were statistically significant for all standards and recommendations examined except protein, the percentage of calories from saturated fat, and sodium. With one exception (cholesterol), the unweighted analysis was more likely than the weighted analysis to classify a school as having met the standard or recommendation.

Exhibit 13

Estimates of the Calorie and Nutrient Content of the Average Lunch Were Different for Weighted and Unweighted Analyses but Conclusions About the One-Third RDA Standard Were Similar



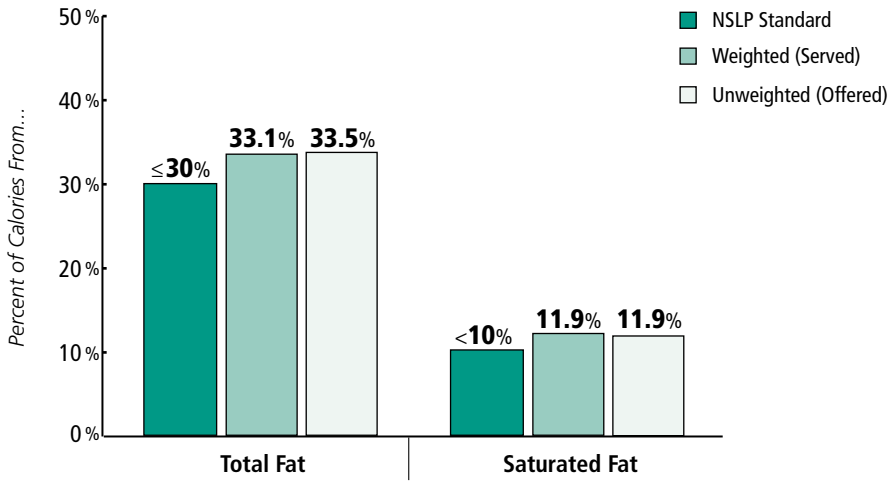
* Difference is statistically significant at the .01 level.

**Difference is statistically significant at the .001 level.

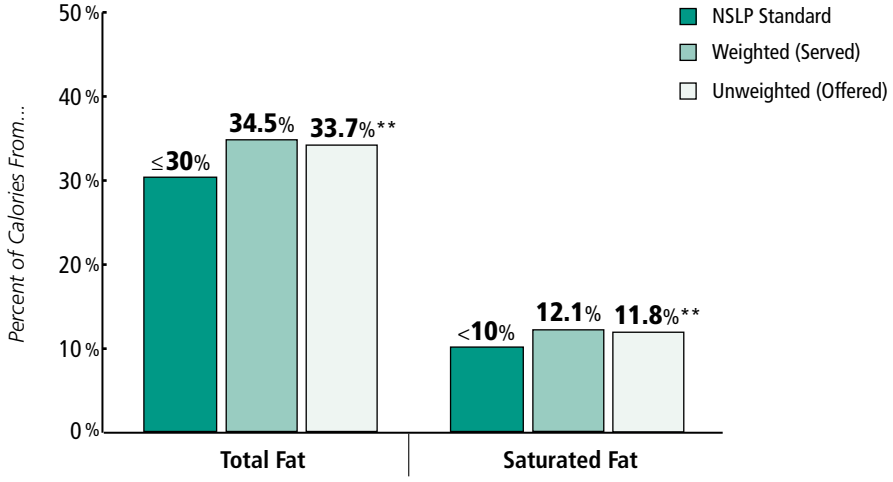
Exhibit 14

Estimates of the Percentage of Calories from Fat and Saturated Fat in Lunches Were Similar for Weighted and Unweighted Analyses

Elementary School Lunches



Secondary School Lunches

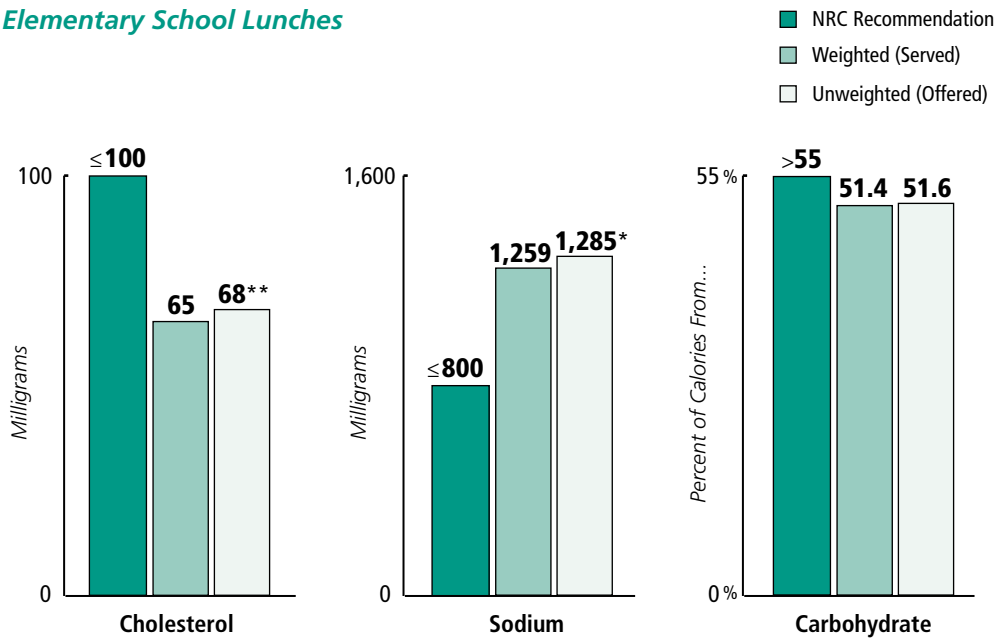


**Difference is statistically significant at the .001 level.

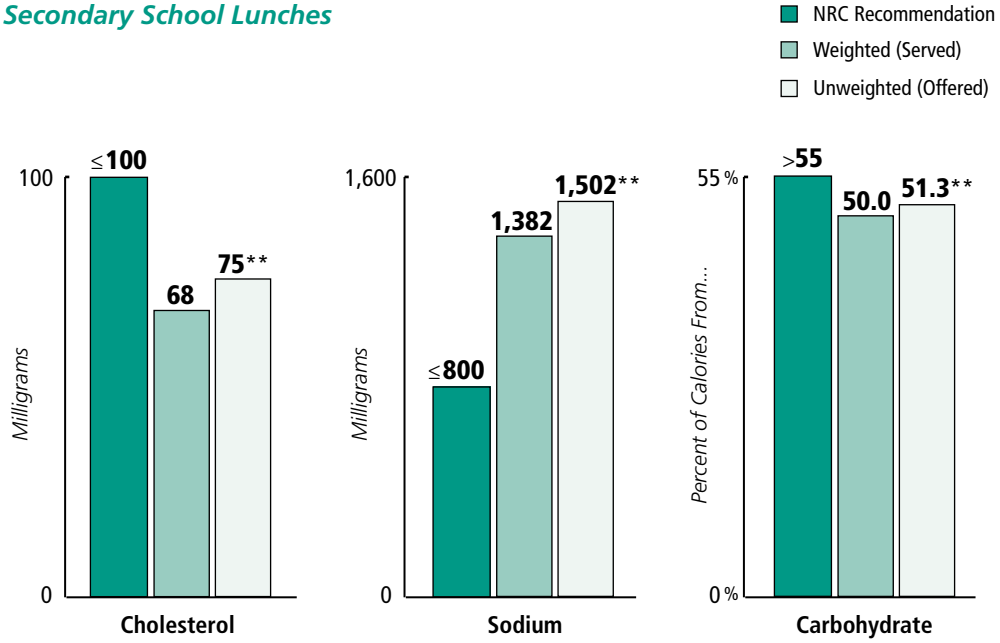
Exhibit 15

Estimates of Cholesterol and Sodium Content Were Different for Weighted and Unweighted Analyses but Conclusions About Whether Lunches Met NRC Recommendations Were Identical

Elementary School Lunches



Secondary School Lunches



* Difference is statistically significant at the .01 level.

**Difference is statistically significant at the .001 level.

Exhibit 16

Percentage of Schools That Satisfied NSLP Standards and NRC Recommendations for Lunch Based on Weighted and Unweighted Analyses

	ELEMENTARY SCHOOLS		SECONDARY SCHOOLS	
	Weighted (Served)	Unweighted (Offered)	Weighted (Served)	Unweighted (Offered)
STANDARD/RECOMMENDATION	**Percentage of Schools**			
Defined NSLP Standards				
Calories	68%	82%**	20%	45%**
Protein	100	100	100	100
Vitamin A	98	99	65	90**
Vitamin C	86	94**	79	94**
Calcium	100	100	86	100**
Iron	93	96	60	71**
Percent of Calories from Fat	21	18	14	21**
Percent of Calories from Saturated Fat	15	15	13	16
NRC Recommendations				
Percent of Calories from Carbohydrate	18	20	14	22**
Cholesterol	99	95	96	90**
Sodium	1	1	<1	<1

**Difference between weighted and unweighted analyses is statistically significant at the .001 level.

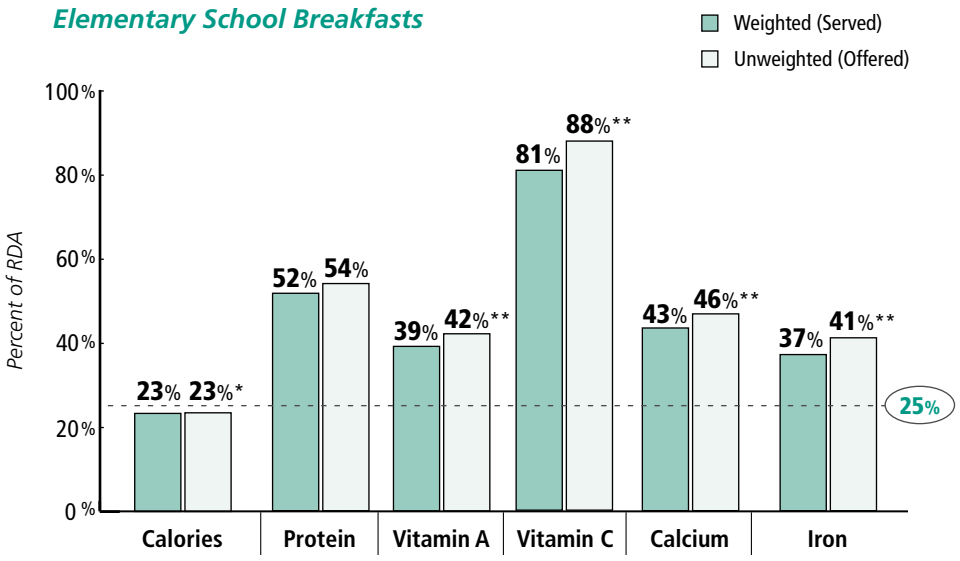
SBP Breakfasts

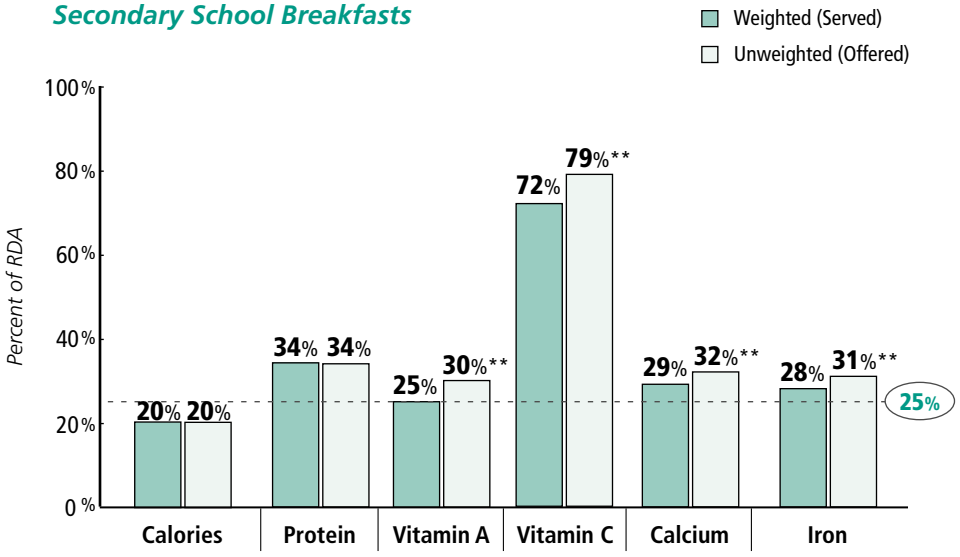
Regardless of which analysis method was used, SBP breakfasts satisfied all RDA standards except calories (Exhibit 17). An unweighted nutrient analysis of breakfast menus generally resulted in greater estimated contributions to RDAs than a weighted analysis. However, the two analyses led to identical conclusions about whether school breakfasts met defined standards for calories and RDA nutrients. Breakfasts consistently met the standard of providing at least one-fourth of the RDA for key nutrients and consistently fell short of this standard for calories.

Both weighted and unweighted analyses indicated that SBP breakfasts met the standard for calories from fat. However, conclusions about whether breakfasts met the standard for calories from saturated fat varied (Exhibit 18). For both elementary and secondary school breakfasts, the weighted analysis resulted in a slightly greater estimate of the percentage of calories provided by total fat and by saturated fat than the unweighted analysis. However, the only difference that was statistically significant and affected conclusions about whether SBP meals met program standards was the difference in the percentage of calories from saturated fat in secondary

Exhibit 17

Estimates of the Calorie and Nutrient Content of the Average Breakfast Were Different for Weighted and Unweighted Analyses but Conclusions About the One-Fourth RDA Standard Were Similar





* Difference is statistically significant at the .01 level.

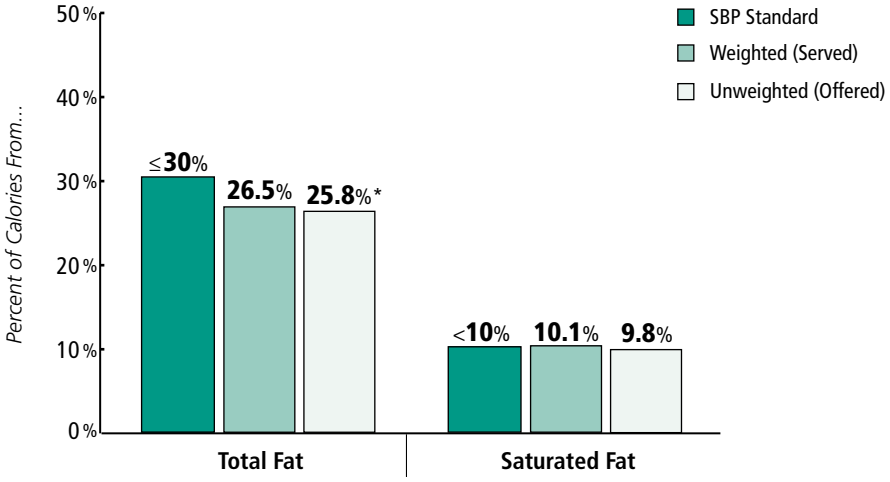
**Difference is statistically significant at the .001 level.

Note: Percent of RDA for calories for elementary schools: 22.6 (weighted) and 23.4 (unweighted).

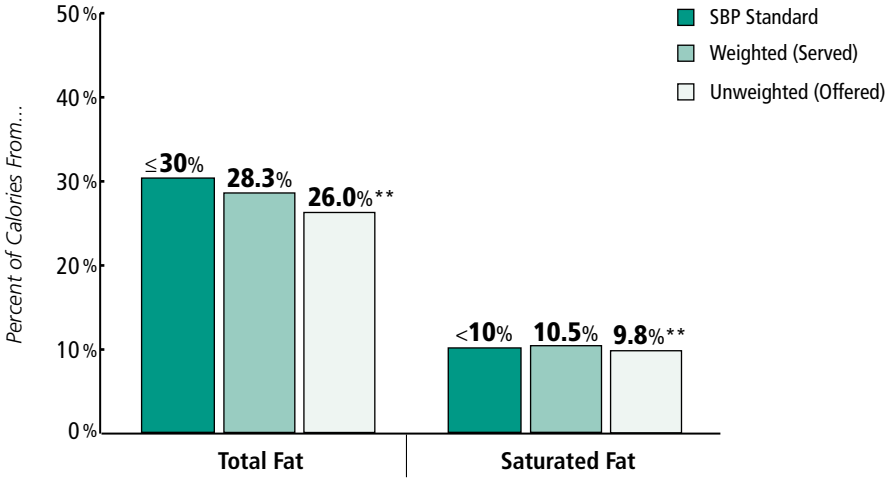
Exhibit 18

Estimates of the Percentage of Calories from Fat and Saturated Fat in Breakfasts Were Similar for Weighted and Unweighted Analyses

Elementary School Breakfasts



Secondary School Breakfasts



* Difference is statistically significant at the .01 level.

**Difference is statistically significant at the .001 level.

school breakfasts. When a weighted analysis was used, the mean percentage of calories from saturated fat in secondary school breakfasts just exceeded the program standard (10.5% of calories compared to the standard of less than 10%). When an unweighted analysis was used, the mean was just below 10 percent and was therefore consistent with the program standard.

Conclusions about whether breakfasts met NRC recommendations for cholesterol, sodium, and calories from carbohydrate were generally similar for weighted and unweighted analyses (Exhibit 19). Regardless of the analysis method used, SBP breakfasts met NRC recommendations for cholesterol and calories from carbohydrate. In addition, both analyses found that elementary school breakfasts met the NRC recommendation for sodium. Secondary school breakfasts exceeded the NRC recommendation for sodium when a weighted analysis was used but essentially met the recommendation when an unweighted analysis was used.

Conclusions about the percentage of individual schools that met SBP standards or NRC recommendations varied for weighted and unweighted analyses. Differences were most apparent for secondary school breakfasts (Exhibit 20). Among elementary schools, differences between the two analysis methods in the percentage of schools considered to have met SBP standards or NRC recommendations were apparent but only two differences — for the percentage of calories from carbohydrate and cholesterol — were statistically significant.

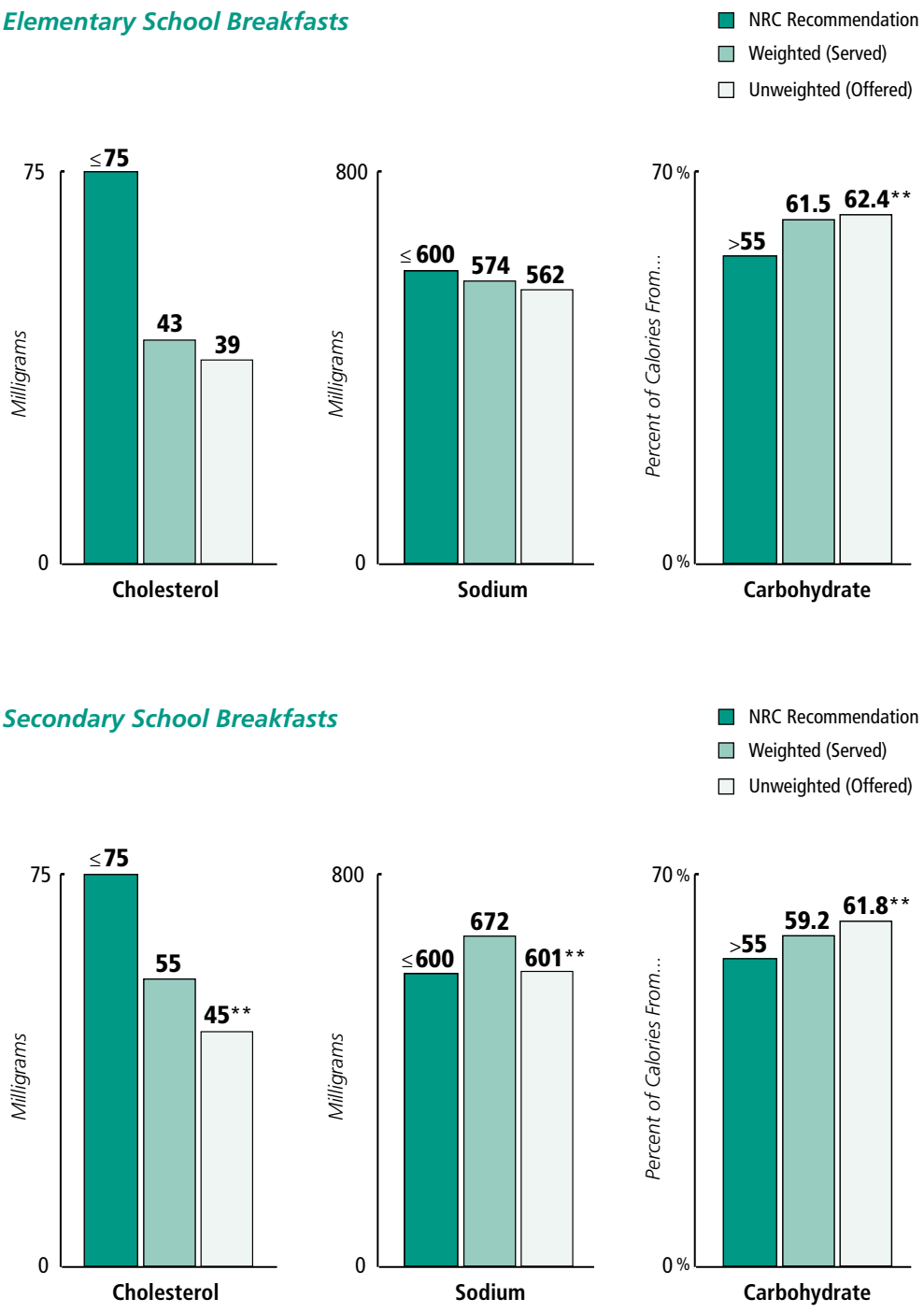
Among secondary schools, differences in the percentage of schools considered to have met SBP standards or NRC recommendations were statistically significant for all standards and recommendations except vitamin C. With the exception of calories, the unweighted analysis was more likely than the weighted analysis to classify a school as having met the standard or recommendation.

Nutrient Content of School Meals Offered in SY 1991-92 and SY 1998-99 (SNDA-I Versus SNDA-II)

The SNDA-I study collected data in SY 1991-92. SNDA-II provides an updated picture of the nutrient content of school meals offered in SY 1998-99. It was not possible to directly compare SNDA-I and SNDA-II data for several reasons, however, so both data sets were reanalyzed. SNDA-I data were reanalyzed limiting the sample to public schools. SNDA-II data were reanalyzed using an unweighted nutrient analysis modeled after the analysis completed in SNDA-I. In addition, to obtain a uniform basis of comparison for calories and RDA nutrients, both SNDA-I and SNDA-II data were compared to minimum calorie and nutrient standards defined for elementary schools (grades K-6) and secondary schools (grades 7-12) in current program regulations.

Exhibit 19

Estimates of Cholesterol and Sodium Content Were Different for Weighted and Unweighted Analyses but Conclusions About Whether Breakfasts Met NRC Recommendations Were Generally Similar



**Difference is statistically significant at the .001 level.

Exhibit 20

Percentage of Schools That Satisfied SBP Standards and NRC Recommendations for Breakfast Based on Weighted and Unweighted Analyses

	ELEMENTARY SCHOOLS		SECONDARY SCHOOLS	
	Weighted (Served)	Unweighted (Offered)	Weighted (Served)	Unweighted (Offered)
STANDARD/RECOMMENDATION	**Percentage of Schools**			
Defined SBP Standards				
Calories	22%	24%	8%	3%**
Protein	100	100	95	100**
Vitamin A	95	99	48	72**
Vitamin C	98	98	95	99
Calcium	99	100	78	100**
Iron	93	90	57	68*
Percent of Calories from Fat	75	79	64	76**
Percent of Calories from Saturated Fat	54	60	46	54*
NRC Recommendations				
Percent of Calories from Carbohydrate	82	90*	72	88**
Cholesterol	90	96**	76	91**
Sodium	63	69	42	57**

* Difference between weighted and unweighted analyses is statistically significant at the .01 level.

**Difference between weighted and unweighted analyses is statistically significant at the .001 level.

Differences noted between SNDA-I (SY 1991-92) and SNDA-II (SY 1998-99) can not be attributed to any one factor. Factors that may contribute to observed differences include changes in the food supply over time, e.g., the introduction of new products and changes in product formulations in both USDA commodity foods and foods available in the quantity food service market; as well as changes in menu planning, food purchasing, and food preparation practices of school food service personnel. Differences in data collection methodology (data for all schools in SNDA-II were collected via a mail survey while data for more than half of the SNDA-I schools were collected on site) and/or in the nutrient data bases used in the two studies may also contribute to the observed differences.

NSLP Lunches

The average lunch offered in both SY 1991-92 and SY 1998-99 exceeded defined minimum nutrition standards for NSLP lunches, except for calories in secondary schools (Exhibit 21). Compared to SY 1991-92, average lunches offered in SY 1998-99 provided significantly more of all key nutrients except protein. The differences are not meaningful, however, because average lunches offered at both points in time substantially exceeded minimum standards defined in current program regulations. Lunches offered at both points in time fell shy of the minimum calorie level for secondary schools.

On average, neither lunches offered in SY 1991-92 nor SY 1998-99 were consistent with NSLP standards for the percentage of calories from total fat and saturated fat. However, lunches offered in SY 1998-99 provided significantly fewer calories from fat and saturated fat than lunches offered in SY 1991-92 (Exhibit 22). The average percentage of calories from fat in lunches offered in SY 1998-99 was about ten percent lower than the average for lunches offered in SY 1991-92 (34% vs. 38%). The percentage of calories from saturated fat in SY 1998-99 lunches was roughly 20 percent lower than the average for SY 1991-92 lunches (12% vs. 15%). It is worth noting that decreases in calories from fat and saturated fat were achieved without a negative impact on the calorie and nutrient content of lunches offered to students (see Exhibit 21).

The data indicate that, between SY 1991-92 and SY 1998-99, there has been a meaningful and statistically significant trend toward lower levels of fat and saturated fat in school lunches, relative to calorie content. Thus, the evidence suggests that public NSLP schools are making good progress toward meeting USDA's strategic goal of satisfying the SMI standards for calories from fat and saturated fat by the year 2005.

Between SY 1991-92 and SY 1998-99, there was a marked increase in the percentage of schools that met NSLP standards for total fat and saturated fat (Exhibit 23). In SY 1991-92, only one percent of all schools offered lunches that provided no more than 30 percent of calories from fat. In SY 1998-99, this figure was substantially higher — 18 percent of elementary schools and 21 percent of secondary schools. In SY 1991-92, no schools satisfied the NSLP standard for saturated fat. In SY 1998-99, 15 percent of elementary schools and 16 percent of secondary schools met this standard.

Lunches offered in SY 1998-99 were significantly lower in cholesterol and sodium and higher in calories from carbohydrate than lunches offered in SY 1991-92. However, conclusions about whether lunches met NRC recommendations were identical (Exhibit 24). The average cholesterol content of lunches offered in both SY 1991-92 and SY 1998-99 was consistent with the NRC recommendation of no more than 100 mg (one-third of the recommended daily maximum). In contrast, the average sodium content of lunches offered at both points in time, in both elementary and secondary schools, exceeded the NRC recommendation of no more than 800 mg by a substantial margin. Lunches offered in both SY 1991-92 and SY 1998-99 also provided fewer calories from carbohydrate than recommended by the NRC.

Exhibit 21

Mean Calorie and Nutrient Content of Lunches Offered in SY 1991-92 and SY 1998-99 Compared to Current NSLP Standards

	MEAN AMOUNT			
	NSLP Standard	SY 1998-99 (Offered)	SY 1991-92 (Offered)	Percentage Change (SY 1998-99 vs. SY 1991-92)
Elementary Schools				
Total Calories	664	738	715	+3%
Protein (gm)	10	30	30	0
Vitamin A (mcg RE)	224	491	397	+24**
Vitamin C (mg)	15	37	28	+32**
Calcium (mg)	286	505	483	+5**
Iron (mg)	3.5	4.6	4.1	+12**
Secondary Schools				
Total Calories	825	798	820	-3%
Protein (gm)	16	33	33	0
Vitamin A (mcg RE)	300	519	418	+24**
Vitamin C (mg)	18	42	34	+24**
Calcium (mg)	400	542	518	+5**
Iron (mg)	4.5	5.0	4.8	+4*

* Difference between SY1998-99 and SY1991-92 is statistically significant at the .01 level.

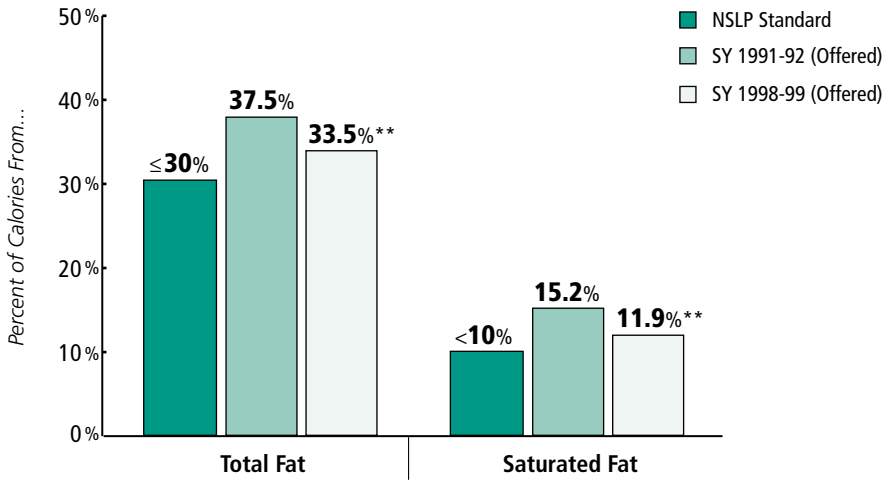
** Difference between SY1998-99 and SY1991-92 is statistically significant at the .001 level.

Note: NSLP standards reflect minimums defined in current program regulations for grades K-6 (elementary schools) and 7-12 (secondary schools).

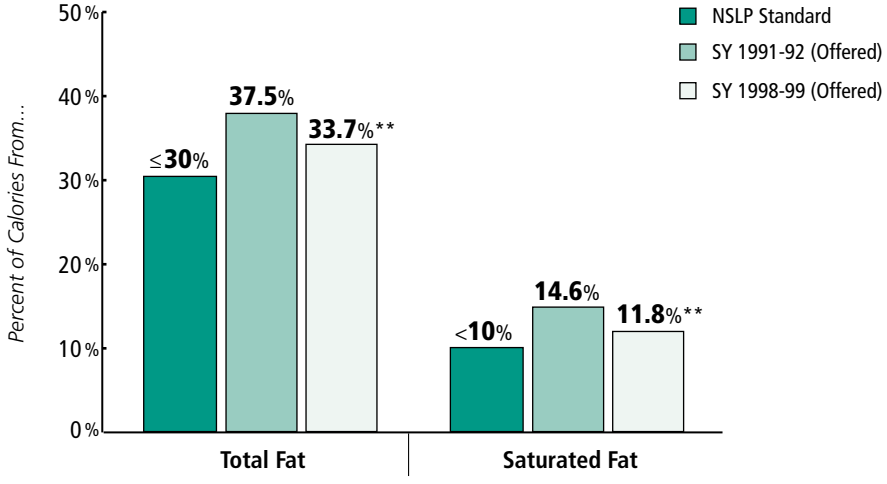
Exhibit 22

Between SY 1991-92 and SY 1998-99 There Was a Significant Trend Toward Lower Levels of Fat and Saturated Fat in School Lunches, As Offered

Elementary School Lunches



Secondary School Lunches



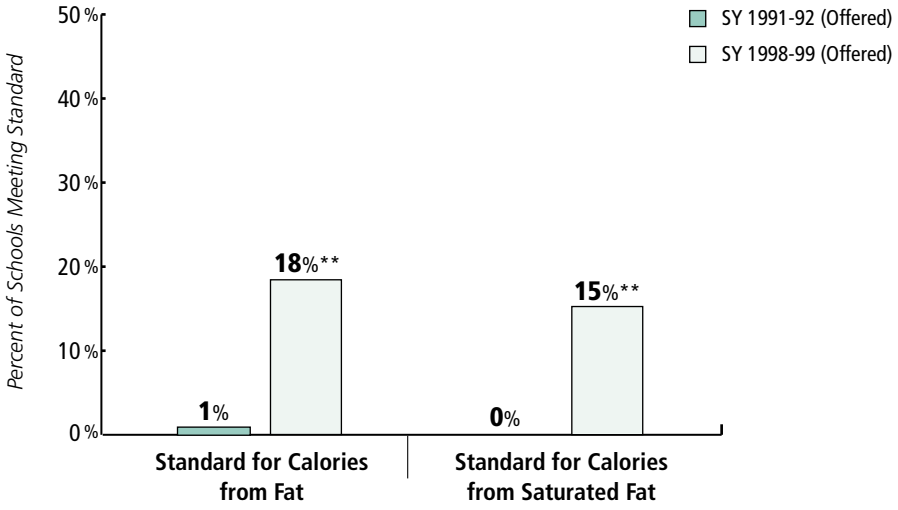
** Difference is statistically significant at the .001 level.

Note: NSLP standards for the percentage of calories from fat and saturated fat were not in effect during SY 1991-92.

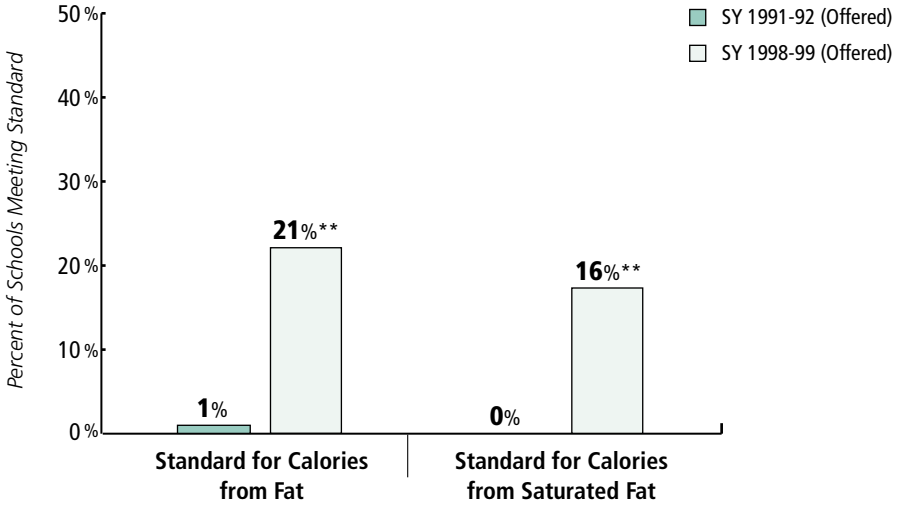
Exhibit 23

For Lunches as Offered, the Percentage of Schools That Met Standards for Total Fat and Saturated Fat Has Increased Substantially Since SY 1991-92

Elementary Schools



Secondary Schools



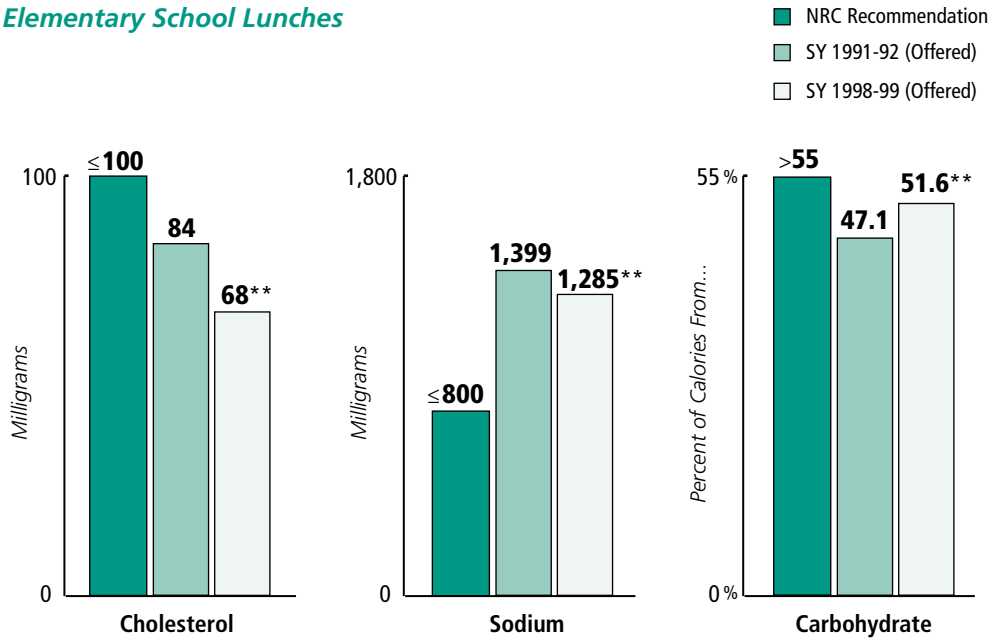
** Difference is statistically significant at the .001 level.

Note: NSLP standards for the percentage of calories from fat and saturated fat were not in effect during SY 1991-92.

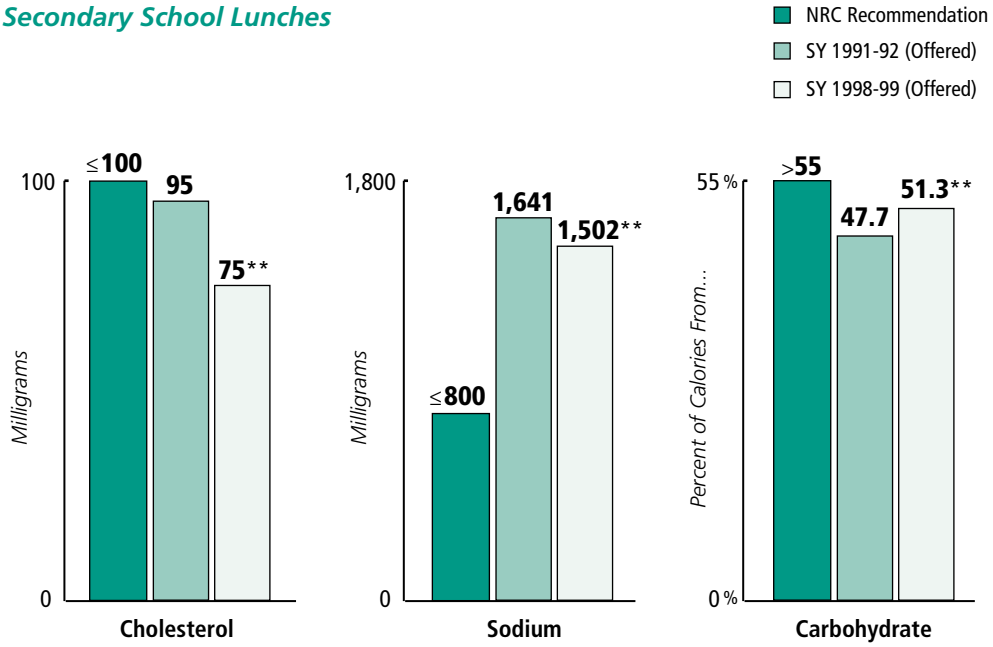
Exhibit 24

Lunches Offered in SY 1998-99 Were Significantly Lower in Cholesterol and Sodium and Higher in Calories from Carbohydrate than Lunches Offered in SY 1991-92

Elementary School Lunches



Secondary School Lunches



**Difference is statistically significant at the .001 level.

In SY 1998-99 substantially more schools offered students the opportunity to select lunches that were low in fat. In SY 1991-92, 34 percent of all elementary schools offered options for a complete meal that, when averaged over a week, provided no more than 30 percent of calories from fat. In SY 1998-99, the percentage of elementary schools that met this criterion was almost 2.5 times higher — 82 percent.

The percentage of secondary schools offering meal options that provided no more than 30 percent of calories from fat over the course of the week also increased between SY 1991-92 and SY 1998-99. The relative magnitude of the increase was substantially smaller, however, because more secondary schools than elementary schools met the criterion in SY 1991-92. The percentage of secondary schools offering low-fat meal options in SY 1991-92 that provided no more than 30 percent of calories from fat was 71 percent. The comparable figure for SY 1998-99 was 91 percent, a 28 percent increase.

In addition to satisfying the NSLP standard for calories from fat, the lowest-percent-fat meals had other nutritional benefits. For example, in SY 1998-99, the lowest-percent-fat meals offered in 65 percent of elementary schools and 79 percent of secondary schools were consistent with the NSLP standard for calories from saturated fat. The lowest-percent-fat meals offered in 21 percent of elementary schools and 14 percent of secondary schools satisfied the NRC recommendation for sodium.

SBP Breakfasts

The average breakfast offered in elementary schools in both SY 1991-92 and SY 1998-99 met minimum nutrition standards defined in current program regulations but fell short of the minimum calorie level (Exhibit 25). Elementary school breakfasts offered in SY 1998-99 provided significantly more vitamin C and significantly less protein and calcium than breakfasts offered in SY 1991-92. The observed differences are inconsequential, however, because elementary school breakfasts offered at both points in time provided, on average, more than the minimum required amount of all key nutrients.

Among secondary schools, breakfasts offered in both SY 1991-92 and SY 1998-99 provided fewer calories than either the minimum defined for grades K-12 or the optional level suggested for grades 7-12 (Exhibit 25). This was especially true for breakfasts offered in SY 1998-99. The mean calorie content of secondary school breakfasts offered in SY 1998-99 was about ten percent lower than the breakfasts offered in SY 1991-92. In spite of a relatively low calorie content, secondary school breakfasts offered in both SY 1998-99 and SY 1991-92 met or exceeded the minimum standards for key nutrients defined for grades K-12 as well as the optional standards defined for grades 7-12.

Exhibit 25

Mean Calorie and Nutrient Content of Breakfasts Offered in SY 1991-92 and SY 1998-99 Compared to Current SBP Standards

	SBP Standard		MEAN AMOUNT SY 1998-99 (Offered)	SY 1991-92 (Offered)	Percentage Change (SY 1998-99 vs. SY 1991-92)
Elementary Schools					
	Grades K-12 (Minimum)				
Total Calories	554		462	480	-4%
Protein (gm)	10		15	16	-6**
Vitamin A (mcg RE)	197		278	290	-4
Vitamin C (mg)	13		40	33	+21**
Calcium (mg)	257		378	398	-5**
Iron (mg)	3.0		4.2	3.8	+11
Secondary Schools					
	Grades K-12 (Minimum)	Grades 7-12 (Optional)			
Total Calories	554	618	483	537	-10%**
Protein (gm)	10	12	16	17	-6*
Vitamin A (mcg RE)	197	225	265	293	-10
Vitamin C (mg)	13	14	42	37	+14
Calcium (mg)	257	300	386	409	-6**
Iron (mg)	3.0	3.4	4.1	4.1	0

* Difference between SY1998-99 and SY1991-92 is statistically significant at the .01 level.

**Difference between SY1998-99 and SY1991-92 is statistically significant at the .001 level.

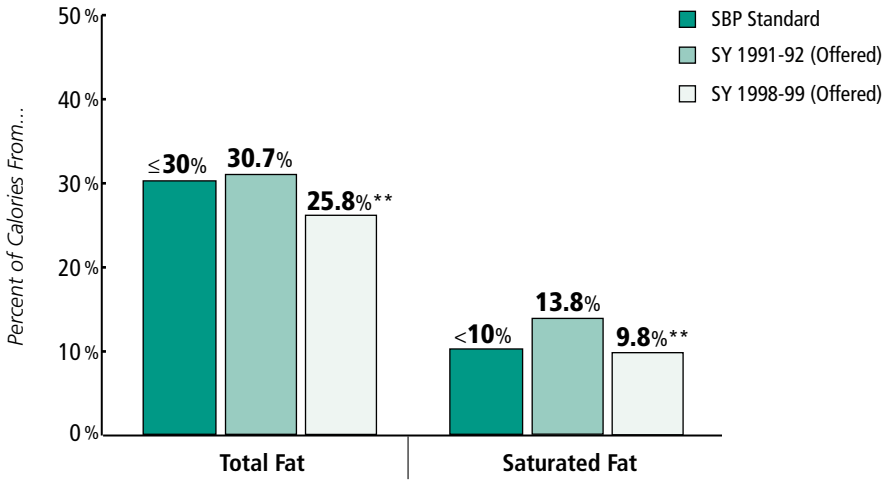
Note: SBP nutrient standards reflect minimums defined in current program regulations for grades K-12 and an optional set of standards for grades 7-12.

Breakfasts offered in SY 1998-99 met SBP standards for total fat and saturated fat while breakfasts offered in SY 1991-92 did not (Exhibit 26). The average breakfast offered in SY 1991-92 provided about 31 percent of calories from fat (compared to the standard of no more than 30 percent) and about 14 percent of calories from saturated fat (compared to the standard of less than 10 percent). The average breakfast offered in SY 1998-99 was significantly lower in calories from fat and saturated fat (26% and 9.8%, respectively). As a result, the average breakfast offered in SY 1998-99, in both elementary and secondary schools, satisfied SBP standards for these nutrients.

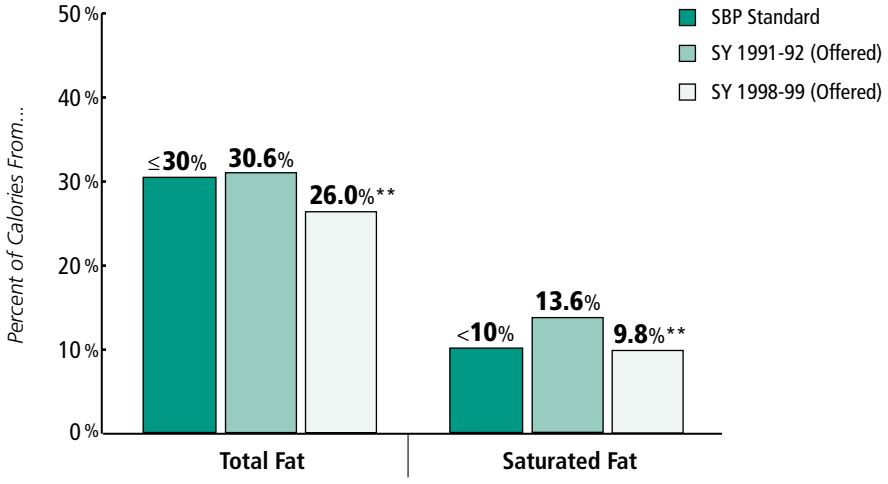
Exhibit 26

Between SY 1991-92 and SY 1998-99 There Was a Significant Decrease in the Relative Fat and Saturated Fat Content of School Breakfasts, As Offered

Elementary School Breakfasts



Secondary School Breakfasts



** Difference is statistically significant at the .001 level.

Note: SBP standards for the percentage of calories from fat and saturated fat were not in effect during SY 1991-92.

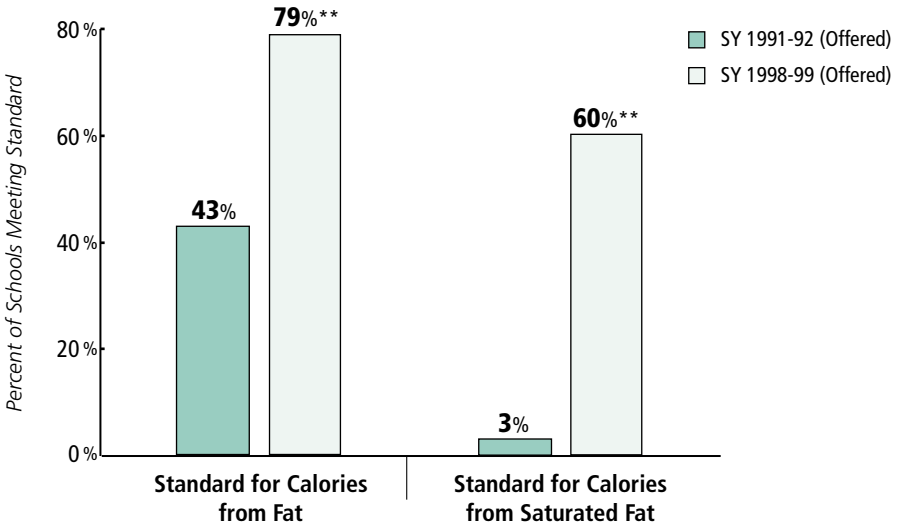
There was a marked increase in the number of schools that met SBP standards for total fat and saturated fat between SY 1991-92 and SY 1998-99 (Exhibit 27). In SY 1991-92, fewer than half of all schools offered breakfasts that provided no more than 30 percent of calories from fat. The picture in SY 1998-99 was dramatically different. In SY 1998-99, more than three-quarters of all schools met the SBP standard for calories from fat. This represents an overall increase of 62 percent (secondary schools) to 84 percent (elementary schools) in the proportion of schools meeting the standard for calories from fat. The increase in the number of schools meeting the standard for saturated fat was even more dramatic. In SY 1991-92, fewer than seven percent of schools satisfied this standard. In SY 1998-99, well over half of all schools met the standard.

Breakfasts offered in SY 1998-99 were significantly lower in cholesterol and sodium and significantly higher in calories from carbohydrate than breakfasts offered in SY 1991-92 (Exhibit 28). The average cholesterol content of breakfasts offered in both SY 1991-92 and SY 1998-99 was consistent with the NRC recommendation of no more than 75 mg (one-fourth of the recommended daily maximum). The average breakfast offered in both elementary and secondary schools in SY 1991-92 exceeded the NRC recommendation for sodium (no more than 600 mg). In SY 1998-99, however, the average breakfast offered in elementary schools met this recommendation and the average breakfast offered in secondary schools came very close to meeting the recommendation. Finally, the average breakfast offered in both SY 1991-92 and SY 1998-99 met the NRC recommendation for calories from carbohydrate.

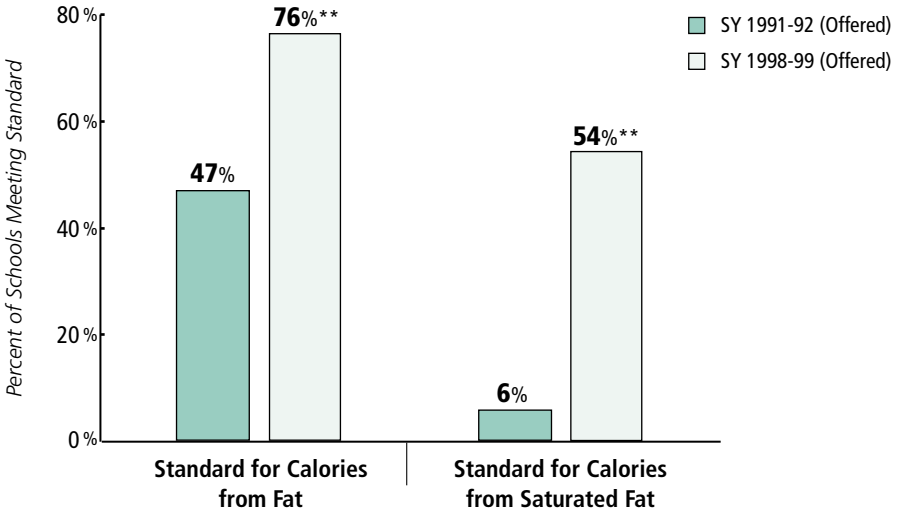
Exhibit 27

For Breakfasts as Offered, the Percentage of Schools That Met Standards for Total Fat and Saturated Fat Has Increased Substantially Since SY 1991-92

Elementary Schools



Secondary Schools



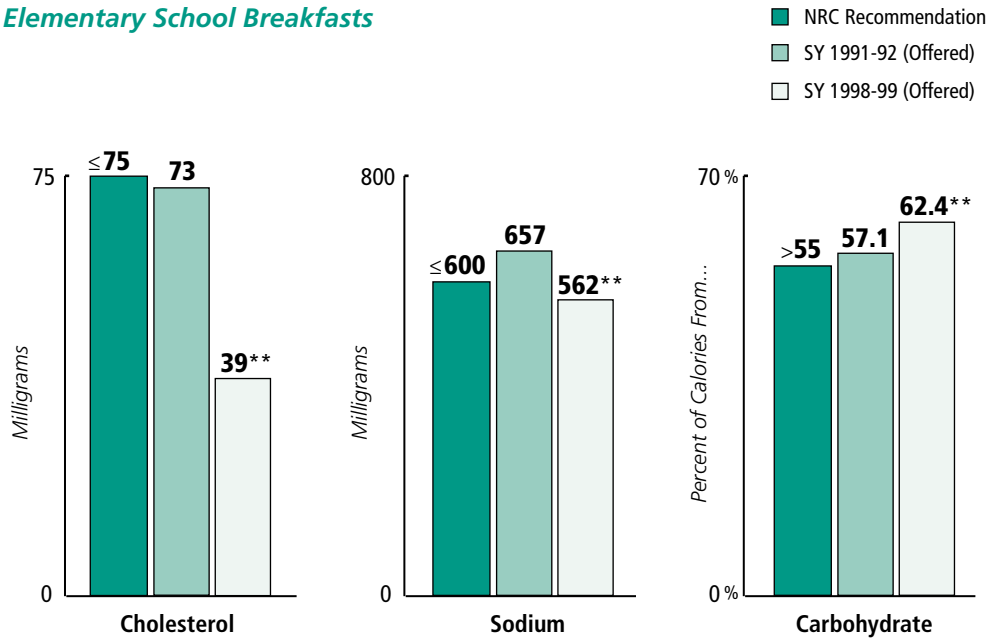
** Difference is statistically significant at the .001 level.

Note: SBP standards for the percentage of calories from fat and saturated fat were not in effect during SY 1991-92.

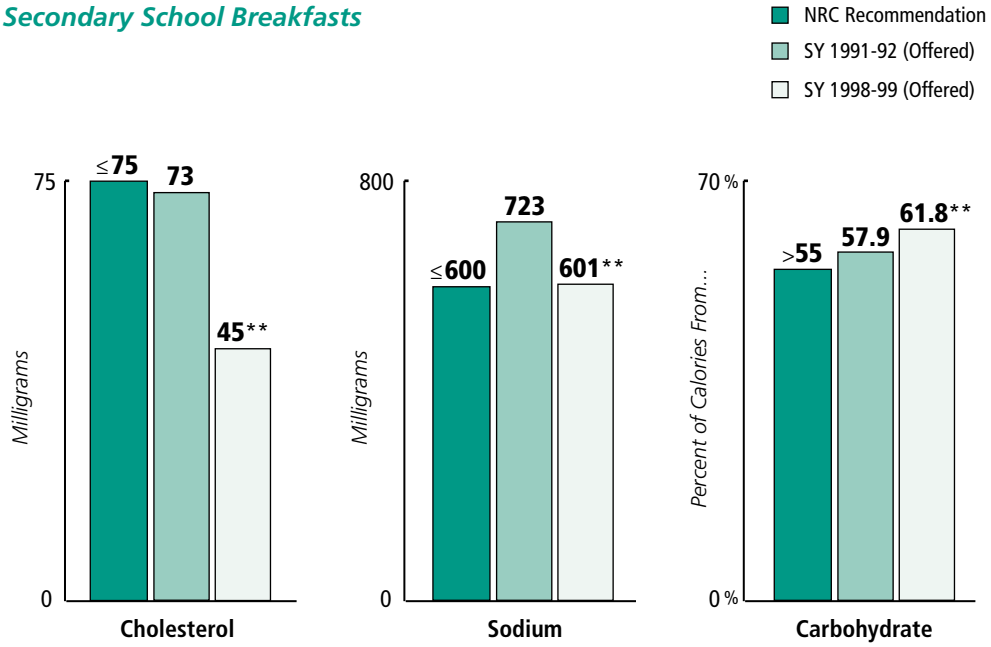
Exhibit 28

Breakfasts Offered in SY 1998-99 Were Significantly Lower in Cholesterol and Sodium and Higher in Calories from Carbohydrate than Breakfasts Offered in SY 1991-92

Elementary School Breakfasts



Secondary School Breakfasts



** Difference is statistically significant at the .001 level.