

School-Level Practices to Increase Availability of Fruits, Vegetables, and Whole Grains, and Reduce Sodium in School Meals — United States, 2000, 2006, and 2014

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Students consume up to half of their daily calories at school, often through the federal school meal programs (e.g., National School Lunch Program) administered by the U.S. Department of Agriculture (USDA) (*1*). In 2012, USDA published new required nutrition standards for school meals.* These standards were the first major revision to the school meal programs in >15 years and reflect current national dietary guidance and Institute of Medicine recommendations to meet students' nutrition needs (*2,3*). The standards require serving more fruits, vegetables, and whole grains and gradually reducing sodium content over 10 years. To examine the prevalence of school-level practices related to implementation of the nutrition standards, CDC analyzed data from the 2000, 2006, and 2014 School Health Policies and Practices Study (SHPPS) on school nutrition services practices related to fruits, vegetables, whole grains, and sodium. Almost all schools offered whole grain foods each day for breakfast and lunch, and most offered two or more vegetables and two or more fruits each day for lunch. The percentage of schools implementing practices to increase availability of fruits and vegetables and decrease sodium content in school meals increased from 2000–2014. However, opportunities exist to increase the percentage of schools nationwide implementing these practices.

SHPPS is a national survey developed and periodically conducted by CDC to assess school health policies and practices at state, district, school, and classroom levels. This report uses school-level data from the 2000, 2006, and 2014 surveys. In each study year, all public, private, and state-administered schools in the United States, containing any of grades kindergarten through grade 12, were eligible for the survey. A two-stage sample design was used to generate a nationally representative sample of elementary, middle, and high schools. Seven school-level questionnaires were administered in each study year; this report provides results from the questionnaire focused on school nutrition services. In each school, the principal or other school contact identified the most knowledgeable respondent for each questionnaire. Between February and June

of each study year, trained interviewers visited each school to conduct computer-assisted personal interviews. Across the 3 study years, the number of sampled schools that completed the nutrition services questionnaire ranged from 554 to 944, and the response rates ranged from 66% to 71%.[†] The percentage of respondents to the nutrition services questionnaire that were food service managers ranged from 69% to 80%, and the percentage of respondents who were other school nutrition services staff ranged from 10% to 12%.

The data from each study were weighted to provide national estimates of school nutrition services practices related to fruits, vegetables, whole grains, and sodium; the statistical software used accounted for the complex sample design. For the 2014 data, prevalence estimates and 95% confidence intervals were computed for each practice, overall and by school level (elementary, middle, and high school). Differences in prevalence estimates by school level were assessed by t-test; p values <0.05 were considered statistically significant. The number of school nutrition services practices used in each school also was calculated. For each question that was included in the 2000, 2006, and 2014 studies, logistic regression analyses with all 3 years of data were used to detect overall trends over time.

During 2014, almost all schools offered whole grain foods each day for breakfast (97.2%) and lunch (94.4%) (Table 1). Most schools offered two or more vegetables (79.4%) and two or more fruits (78.0%) each day for lunch. Approximately one third (30.5%) of schools offered self-serve salad bars. Among the 55.0% of schools that prepared food at the school rather than in another location, such as a central kitchen, during the 30 days before the study, approximately half almost always or always used practices to reduce sodium, including using fresh or frozen vegetables instead of canned vegetables (54.1%), using low-sodium canned vegetables instead of regular canned vegetables (51.8%), using other seasonings instead of salt (65.1%), and reducing the amount of salt called for in recipes or using low-sodium recipes (68.0%).

[†] In the 2014 sample, 52.0% of schools were elementary schools, 27.4% were middle schools, and 20.6% were high schools. Additionally, 72.6% were public schools, 22.9% were private schools, and 4.4% were state-administered schools.

* National School Lunch Program requirements available at <http://www.ecfr.gov/cgi-bin/text-idx?SID=6e619efd3476fc185e85495e42f62127&nnode=7:4.1.1.1.1.3.1.2&rgn=div8> and School Breakfast Program requirements available at <http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&nnode=7:4.1.1.1.3#7:4.1.1.1.3.0.1.8>.

TABLE 1. Percentage of schools that engaged in specific school nutrition services practices in the school meal programs, by school level — School Health Policies and Practices Study, 2014

Practice	School level							
	Total (n = 554)		Elementary (n = 192)		Middle (n = 179)		High (n = 183)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Offered								
Whole grain foods each day for breakfast	97.2	(94.9–98.5)	98.4	(93.9–99.6)	98.8	(95.1–99.7)	93.1	(87.3–96.3)*
Whole grain foods each day for lunch	94.4	(91.4–96.4)	94.2	(88.4–97.2)	94.1	(88.8–96.9)	95.5	(89.5–98.1)
≥2 different nonfried vegetables each day for lunch	79.4	(73.8–84.1)	79.5	(71.0–86.0)	78.0	(70.1–84.3)	80.9	(71.5–87.8)
≥2 different fruits or types of 100% fruit juice each day for lunch	78.0	(72.1–82.9)	74.9	(65.4–82.5)	77.2	(69.3–83.6)	86.8	(80.5–91.3)†
Self-serve salad bar	30.5	(24.9–36.9)	28.6	(21.5–37.0)	31.2	(23.6–39.9)	34.7	(26.9–43.4)
Always or almost always[§]								
Used fresh or frozen vegetables (instead of canned)	54.1	(46.6–61.4)	51.7	(40.6–62.7)	58.5	(49.3–67.1)	54.0	(41.9–65.7)
Used low-sodium (instead of regular) canned vegetables	51.8	(44.9–58.7)	54.2	(44.0–64.0)	52.5	(41.1–63.6)	46.0	(35.9–56.4)
Used other seasonings instead of salt	65.1	(58.4–71.3)	68.9	(59.2–77.2)	59.5	(47.6–70.3)	63.7	(51.8–74.2)
Reduced amount of salt called for in recipes or used low-sodium recipes	68.0	(61.2–74.1)	69.2	(58.4–78.3)	65.3	(54.8–74.5)	68.5	(56.5–78.5)

Abbreviation: CI = confidence interval.

* The percentage of high schools that offered whole grain foods each day for breakfast was significantly lower than the percentage of elementary schools and middle schools that did so ($p \leq 0.05$).

† The percentage of high schools that offered two or more fruits each day for lunch was significantly higher than the percentage of elementary schools and middle schools that did so ($p \leq 0.05$).

§ During the 30 days before the study, among the 55.0% of schools overall, 50.6% of elementary schools, 55.2% of middle schools, and 66.0% of high schools in which food is prepared at the school.

Only two of the nine school nutrition services practices examined in the 2014 study varied by school level. The percentage of high schools that offered whole grain foods each day for breakfast was significantly lower than the percentage of elementary schools and middle schools that did so, and the percentage of high schools that offered two or more fruits each day for lunch was significantly higher than the percentage of elementary schools and middle schools that did so. Overall, 97.5% of schools used at least one of the nine school nutrition services practices examined, with 23.9% using one to three of the practices, 48.3% using four to six of the practices, and 25.3% using seven or more of the practices.

From 2000 through 2014, the percentage of schools offering two or more fruits every day for lunch, offering two or more vegetables every day for lunch, using low-sodium canned vegetables instead of regular canned vegetables, using other seasonings instead of salt, and reducing the amount of salt called for in recipes or using low-sodium recipes increased significantly (Table 2).

Discussion

Most U.S. youth do not meet national recommendations for having a healthy diet, including consuming sufficient amounts of fruits, vegetables, and whole grains (3–5); this can put them at risk for weight gain, obesity, diabetes, and other diseases. Additionally, approximately 90% of U.S. children consume more sodium than recommended (6). School meal programs are an important source of nutrition for U.S. youth. Each

school day, >30 million students participate in the National School Lunch Program[§] and >13 million participate in the School Breakfast Program.[¶] Students who eat school meals are more likely to consume milk, fruits, and vegetables during meal times than students who do not participate in the meal programs (7). Additionally, school meal participants have better intake of some key nutrients, such as calcium and fiber, than nonparticipants (8).

Recently published data indicate that 95% of school food authorities** or school districts nationwide are certified as compliant with the nutrition standards.^{††} Findings in this report also show that schools are using various practices to meet the nutrition standards for school meals. Furthermore, use of all five school nutrition services practices examined for which trend analyses are possible has increased over time.

However, opportunities to increase implementation of school nutrition services practices related to fruit and vegetable availability and sodium reduction still exist. For example, many

[§] U.S. Department of Agriculture (USDA), National School Lunch Program: participation and lunches served. Available at <http://www.fns.usda.gov/sites/default/files/pd/slsummar.pdf>.

[¶] USDA School Breakfast program: participation and meals served. Available at <http://www.fns.usda.gov/sites/default/files/pd/sbsummar.pdf>.

** School food authority means the governing body, such as a school district, that is responsible for the administration of one or more schools and has the legal authority to operate the school meal programs (e.g., National School Lunch Program).

^{††} USDA, Percent of School Food Authorities (SFA) certified for the performance based reimbursement as of December 2014. Available at <http://www.fns.usda.gov/school-meals/school-meal-certification-data>.

TABLE 2. Trends over time* in the percentage of schools that engaged in specific school nutrition services practices in the school meal programs, School Health Policies and Practices Study, 2000, 2006, and 2014

Practice	Year						p-value for trend
	2000 (n = 841)		2006 (n = 944)		2014 [†] (n = 554)		
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Offered each day							
≥2 different nonfried vegetables for lunch	61.7	(56.9–66.2)	63.4	(58.8–67.8)	79.4	(73.8–84.1)	<0.001
≥2 different fruits or types of 100% fruit juice for lunch	68.1	(63.1–72.7)	66.3	(61.2–71.0)	78.0	(72.2–82.9)	0.064
Always or almost always[§]							
Used low-sodium (instead of regular) canned vegetables	10.3	(7.8–13.6)	15.6	(12.4–19.5)	51.8	(44.8–58.8)	<0.001
Used other seasonings instead of salt	32.8	(28.6–37.3)	39.2	(34.1–44.6)	65.1	(58.4–71.3)	<0.001
Reduced amount of salt called for in recipes or used low-sodium recipes	34.1	(29.4–39.1)	45.8	(41.2–50.5)	68.0	(61.3–74.1)	<0.001

Abbreviation: CI = confidence interval.

* Trend analyses conducted for questions included in 2000, 2006, and 2014 studies. Table includes significant linear trends based on logistic regression analyses with all 3 years of data.

† Results reflect practices after the new nutrition standards for school meals went into effect.

§ During the 30 days before the study, among the schools in which food is prepared at the school.

schools need new kitchen equipment to store, prepare, and serve fruits and vegetables (9). Although self-serve salad bars can help schools meet the requirements for amount and variety of vegetables offered, they were only offered in one third of schools in 2014. One public-private partnership, Let's Move Salad Bars to Schools (<http://www.saladbars2schools.org/>), has provided approximately 4,000 self-serve salad bars to schools across the country (10). Although implementation of practices to reduce sodium has increased since 2000, further training and technical assistance could support more widespread implementation of sodium reduction strategies. USDA is leading the What's Shaking? Creative Ways to Boost Flavor with Less Sodium initiative to help schools offer flavorful school meals with lower sodium content (<http://healthymeals.nal.usda.gov/whatsshaking>). This initiative provides resources for school nutrition professionals, including training, sample menus, and recipes, plus materials for school administrators, teachers, parents, and other stakeholders to increase awareness and support schools in achieving sodium reduction in school meals. Reducing sodium in school meals will depend on the efforts of multiple stakeholders, including schools, school districts, parents and other caregivers, and industry.

The findings in this report are subject to at least three limitations. First, the SHPPS questions differ in some ways from the nutrition standards for school meals. For example, SHPPS questions ask about whole grain foods in the school meal programs, whereas the requirements are for whole grain-rich foods, which have a specific definition.^{§§} Second, four of the

nine school nutrition services practices examined only reflect responses from the 55% of schools in which food is prepared at the school. In the remaining 45% of schools, food is not prepared at the school and therefore respondents in these schools did not answer these specific questions. However, SHPPS 2012 data, collected among a nationally representative sample of school districts, show similar improvements in these school nutrition services practices among districts in which food is not prepared at individual schools.^{¶¶} Third, as data are self-reported, there might be over- or underreporting, or responses might reflect poor respondent knowledge.

Many resources exist to help schools meet nutrition standards for school meals. The foods available to schools through the USDA Foods program include whole grain-rich options (e.g., parboiled brown rice, whole grain macaroni), lower sodium mozzarella cheese, and only reduced sodium canned beans and vegetables.^{***} USDA's Team Nutrition initiative (<http://www.teamnutrition.usda.gov/>) provides technical assistance and resources to schools on meeting the new nutrition standards. State agencies and school districts can continue to provide schools with training and technical assistance on practices to prepare meals that meet the standards, including choosing lower sodium versions of foods, flavoring foods with spices and herbs, preparing fruits and vegetables that are appealing to students, and incorporating whole grain-rich foods into meals. The Institute of Child Nutrition (<http://www.nfsmi.org/>) offers in-person and online trainings for school nutrition professionals on these topics. In addition to these resources, school districts can publicize their successes in newsletters and stories

^{§§} Foods that qualify as whole grain-rich for the school meal programs are foods that contain 100% whole grain or contain a blend of whole-grain meal and/or flour and enriched meal and/or flour of which at least 50% is whole grain. Whole grain-rich products must contain at least 50% whole-grains and the remaining grain, if any, must be enriched. Available at <http://www.fns.usda.gov/sites/default/files/SP30-2012os.pdf>.

^{¶¶} Results from the School Health Policies and Practices Study 2012, chapter seven, table six. Available at http://www.cdc.gov/healthyyouth/shpps/2012/pdf/shpps-results_2012.pdf#page=81.

^{***} Reduced sodium = ≤140 mg per half-cup serving.

Summary

What is already known about this topic?

In 2012, the U.S. Department of Agriculture published new required nutrition standards for the National School Lunch Program and School Breakfast Program, which require serving more fruits, vegetables, and whole grains and gradually reducing sodium over 10 years.

What is added by this report?

To examine the prevalence of school-level practices related to the implementation of the nutrition standards, CDC analyzed data from the 2000, 2006, and 2014 School Health Policies and Practices Study on school nutrition services practices related to fruits, vegetables, whole grains, and sodium. Although most schools are implementing practices to help meet the standards, opportunities exist to increase fruit and vegetable availability and reduce sodium content in school meals.

What are the implications for public health practice?

Efforts at the national, state, and local levels are needed to help schools meet the nutrition standards. These efforts include ensuring schools have appropriate kitchen equipment; providing training for school nutrition professionals on choosing lower sodium versions of foods, flavoring foods with spices and herbs, preparing fruits and vegetables that are appealing to students, and incorporating whole grain-rich foods into meals; continuing industry efforts to reformulate products to reduce sodium content; and engaging other stakeholders to help increase awareness about and support school meals that meet the nutrition standards.

to local media to encourage participation in the school meal programs, and share successful strategies and lessons learned with other school districts. Implementation of the nutrition standards for school meals helps to ensure that all students have access to meals that align with national recommendations for healthy eating.

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