



Snacks, Sweetened Beverages, Added Sugars, and Schools

COUNCIL ON SCHOOL HEALTH, COMMITTEE ON NUTRITION

Concern over childhood obesity has generated a decade-long reformation of school nutrition policies. Food is available in school in 3 venues: federally sponsored school meal programs; items sold in competition to school meals, such as a la carte, vending machines, and school stores; and foods available in myriad informal settings, including packed meals and snacks, bake sales, fundraisers, sports booster sales, in-class parties, or other school celebrations. High-energy, low-nutrient beverages, in particular, contribute substantial calories, but little nutrient content, to a student's diet. In 2004, the American Academy of Pediatrics recommended that sweetened drinks be replaced in school by water, white and flavored milks, or 100% fruit and vegetable beverages. Since then, school nutrition has undergone a significant transformation. Federal, state, and local regulations and policies, along with alternative products developed by industry, have helped decrease the availability of nutrient-poor foods and beverages in school. However, regular access to foods of high energy and low quality remains a school issue, much of it attributable to students, parents, and staff. Pediatricians, aligning with experts on child nutrition, are in a position to offer a perspective promoting nutrient-rich foods within calorie guidelines to improve those foods brought into or sold in schools. A positive emphasis on nutritional value, variety, appropriate portion, and encouragement for a steady improvement in quality will be a more effective approach for improving nutrition and health than simply advocating for the elimination of added sugars.

INTRODUCTION

The rising rate of obesity in the United States has resulted in increased attention on nutrition and long-term health. Not only have children and adolescents become overweight from consuming excess calories relative to activity, but their diets have also become inadequate or deficient in several crucial nutrients.^{1,2} Consistently, 30% to 40% of daily energy of children and adolescents is consumed as energy-dense, nutrient-poor foods and drinks.^{1,3} More than 55 million children and teenagers attend the nation's 105 000 schools and consume 35% to 40% of their daily

abstract

FREE

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

Policy statements from the American Academy of Pediatrics benefit from expertise and resources of liaisons and internal (AAP) and external reviewers. However, policy statements from the American Academy of Pediatrics may not reflect the views of the liaisons or the organizations or government agencies that they represent.

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

DISCLOSURES: *Dr Murray receives support from the National Dairy Council and the American Dairy Association for serving on speakers' bureaus. Dr Bhatia receives support from the Nestle Nutrition Institute for serving as workshop faculty and an advisor.*

www.pediatrics.org/cgi/doi/10.1542/peds.2014-3902

DOI: 10.1542/peds.2014-3902

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2015 by the American Academy of Pediatrics

energy in those schools.⁴ The intent of the present statement is to update progress since the Council on School Health issued its policy statement “Soft Drinks in Schools” in 2004 and to highlight new opportunities for improving diet quality in schools.

Foods and beverages are available to students in schools through 3 venues:

1. The School Breakfast, National School Lunch, and After-School Programs, sponsored by the US Department of Agriculture (USDA);
2. Competitive items sold outside of the USDA school meals; and
3. Items available from other sources (packed meals or snacks, in-class parties, rewards, sporting events, and other such occasions).

This third source of foods consumed in school, brought in for many different reasons by many different individuals, is unregulated. It represents an opportunity for pediatricians to join with parents and students, as well as other advocates for child nutrition, to raise an awareness of the importance of nutritional choices for children and adolescents.

OPTIMAL NUTRITION FOR CHILDREN AND ADOLESCENTS

Optimal nutrition for individuals older than 2 years is described by the 2010 Dietary Guidelines for Americans (DGAs), based on the recommendations of an independent expert advisory committee.^{2,5} The committee recommended consumption of a diverse, nutrient-dense diet based on 5 food groups: vegetables, fruits, grains and whole grains, low-fat or no-fat milk and dairy, and quality protein sources. The primary directive of the DGAs was for individuals to obtain nutrition from a variety of whole foods based on a sound dietary pattern of appropriate servings from each food group that meets, but not exceeds, caloric needs. As exemplars, the 2010 DGAs referenced the USDA Food Patterns (<http://www.cnpp.usda.gov/USDAFoodPatterns.htm>),

the DASH diet (Dietary Approaches to Stop Hypertension; <http://www.nhlbi.nih.gov/health/health-topics/topics/dash/>), and the vegetarian eating pattern because of their established health benefits. The DGAs identified 4 nutrients (potassium, fiber, vitamin D, and calcium), of which Americans have consistently low consumption, resulting in a high risk of chronic diseases.⁵ The DGA Advisory Committee, recognizing the challenge of energy balance, proposed that all Americans cut their intake of solid fats and added sugars as an effective strategy to pare calories that contribute little to a nutrient-rich diet.² The Academy of Nutrition and Dietetics has long espoused the perspective that “all foods fit”; that is, a balanced, nutrient-rich dietary pattern still can accommodate all the types of foods, when foods with added sugars and fats are consumed judiciously. Discretionary calories (ie, calories remaining after fulfilling the body’s nutrient needs from the 5 food groups) may include added sugars, which can heighten the palatability and enjoyment of food and play a role in food safety and quality.^{6,7}

THE NATIONAL SCHOOL MEAL PROGRAMS: STEADY IMPROVEMENT

USDA meal programs in school represent a national investment of \$13.7 billion in cash reimbursement and commodity costs annually. School meal programs have a profound effect on the diet quality of the nation’s children, in particular children at risk for food insecurity.⁸⁻¹² Participating schools serve more than 31 million lunches and 11 million breakfasts per day, of which approximately one-half of the participants in the National School Lunch Program and three-quarters in the School Breakfast Program fit the eligibility criteria for free or reduced-price meals (fiscal year 2010 data: <http://www.fns.usda.gov/pd/sbsummar.htm> and <http://www.fns.usda.gov/pd/slsummar.htm>). Two-thirds of children and

teenagers from female-headed households (among the highest risk for food insecurity) benefit from free meals (<http://www.fns.usda.gov/cnd/governance/notices/iegs/iegs.htm>).¹³ Schools saw a sharp rise in meal program enrollment after the severe economic downturn in 2007. Collectively, the following school-based and auxiliary programs form a nutrition safety net for children (<http://www.fns.usda.gov/cnd/>):

- The National School Lunch Program
- The School Breakfast Program
- After School Snacks
- The Special Milk Program
- The Fresh Fruit and Vegetable Program
- The Child and Adult Care Meal Program
- The Seamless Summer Program

Data from 3 School Nutrition Dietary Assessment (SNDA) surveys between 1995 and 2009 showed rapid improvements in nutrition quality, increasingly aligned with DGA recommendations.^{8,14,15} Consistently, children consuming school meals had better nutrition than those consuming alternative meals, with higher intake of protein, vitamins A and B₁₂, riboflavin, calcium, phosphorus, potassium, and zinc. Approximately two-thirds of schools offered students a choice each day for lunch of 1 of 2 or more types of fruit or 100% fruit juice, 1 of 2 or more entrees or main courses, and 1 of 2 or more vegetables. Most schools limited milk to either low-fat or nonfat milk.^{8,9,16}

However, the latest SNDA report (2009) noted that improvements were needed in several areas. For instance, only 9 of 22 specific food preparation practices recommended by nutritionists as strategies for reducing the total fat, saturated fat, sodium, and added sugar content of school meals had been implemented “almost always” or “always” by most districts and schools.¹¹ Only 6%

offered lunches that met all of the standards of the School Meals Initiative (<http://www.fns.usda.gov/cnd/guidance/default.htm>). Although approximately 60% met the fat standard (25%–35% of total kilocalories), only 30% kept saturated fat under 10% of kilocalories. Diverse sources of saturated fats in schools were still prevalent in school meals in the 2007 SNDA. Almost no school met the goals for sodium; meeting these goals will require not only better preparation techniques but also many new low-sodium products before the proposed 50% cuts in sodium can be realized over the next 10 years.^{8,10,11} It was revealed that raw or fresh vegetables and fresh fruits were unavailable in 42% and 50% of schools, respectively. Because of higher costs, only 5% of the breads or rolls offered were whole grain.¹⁶

These findings prompted the Institute of Medicine (IOM) to recommend incorporation of more lean meats, lower fat milks (nonfat or 1% only), fruits, vegetables, and whole grains, along with age-appropriate serving sizes.¹⁰ An IOM report, “School Meals: Building Blocks for Healthy Children,” formed the basis for new meal patterns from the USDA, which were finalized in January 2012. When a series of school meal menus were tested that met IOM criteria, the data showed that their system would meet the Recommended Dietary Allowance for 24 nutrients, based solely on serving frequencies of the 5 food groups and age-appropriate serving sizes. This finding has 3 important implications. One, it represents a strong confirmation of the concept of food patterns, as espoused by the 2010 DGAs. Two, it supports moving away from using individual nutrients as markers for nutritional sufficiency in school meals. Three, it should serve to caution those who wish to revise or revoke individual recommendations within the proposed meal patterns. Clearly, the proposed servings-based meal patterns can work. Discretionary calories remained

within the IOM plan, recognizing that school food service directors often use these limited, but popular, discretionary calories to entice participation in the meal program.

Higher quality school meals engender substantial costs. Despite an additional \$0.06 per meal allocated by the 2010 Child Nutrition Reauthorization, reimbursement for food service over the past 20 years has never kept pace with rising expenses or inflation.¹⁷ The National School Boards Association cited the fact that, even by the USDA’s conservative estimates, the recent reimbursement rates (2010) will cover less than one-half the costs of implementing the new nutrition standards over the next 5 years (<http://www.nsba.org/Advocacy/Key-Issues/SchoolNutrition/NSBAIssueBriefonSchoolNutrition.pdf>). If the price of nonreimbursed meals increases as a result, more children may bring meals from home, purchase food from other sources, or skip meals altogether, each of which will be detrimental to achieving better diet quality. Additional federal and state budget cuts in the near-term threaten many aspects of our child nutrition strategy, an important point of advocacy for the American Academy of Pediatrics (AAP).

ITEMS SOLD IN COMPETITION TO SCHOOL MEALS: NEW NATIONAL STANDARDS

Competitive foods sold in vending machines and a la carte lines represent a far less nutritious option than the USDA-sponsored school meals.¹⁸ Until 2010, federal law restricted the sale of carbonated drinks, candies, and other “foods of minimal nutritional value” only in the cafeteria during meal service hours, leaving many nutrient-poor products available for sale with lax oversight.^{9,19,20} Access to “empty calories” has been associated with higher daily energy intake and greater BMI and, equally important,

with displacement of more nutrient-rich alternatives.^{1,21–23} Competitive foods are a double-edged sword for the school food service. On the one hand, they subtract consumers from the school meals, robbing the school of valuable federal reimbursements. On the other hand, a la carte and vending sales are attractive to students and can be lucrative for schools. However, many schools that have taken steps to improve the nutritional quality of competitive foods have not reported subsequent losses in total revenue, and in some cases, have even increased revenue and school meal participation, contrary to widely held expectations.^{24,25}

In 2004, the AAP published a policy statement (“Soft Drinks in Schools”) in response to a growing trend toward contracts for exclusive right of sale between school districts and their beverage distributors.²⁶ The voice of the AAP was just one in a chorus of concern about poor nutrition and child health. The Alliance for a Healthier Generation was formed as a collaborative to help address childhood obesity. It published “School Beverage Guidelines” in 2007.²⁷ In these guidelines, the beverage industry committed to altering the availability and mix of beverages offered in schools. Their self-imposed regulations were not without skeptics.²⁸ Of greatest concern was the likelihood that innovations by industry would usher in new but similar alternatives. To some extent, this prediction has been borne out. Fruit drinks, sports rehydration drinks, energy drinks, sweetened teas, and coffees have joined water, milks, and fruit juice as replacements for more traditional soft drinks.

However, substantial progress was made after the voluntary Alliance for a Healthier Generation agreement.²⁷ A report from the alliance issued in 2010 cited an 88% decrease in total calories shipped to schools, a 95%

decrease (in ounces) of full-calorie carbonated soft drinks, and a corresponding increase in more acceptable alternatives, such as water, 100% fruit juice, and rehydration drinks in smaller portion sizes. Nevertheless, school-based surveys still recorded widespread availability of sweetened beverages in US schools, at least partly because of suppliers operating outside of exclusive or formal contracts, as addressed by the alliance agreement.^{19,20,29}

Other forms of sweetened drinks have become popular in schools as well, replacing carbonated soft drinks. The AAP issued a policy statement in 2011 on the role of rehydration drinks among children and adolescents, warning that their use outside of prolonged, vigorous-intensity physical activity involving fluid and electrolyte depletion delivered unwarranted energy and added sugar. Water is the appropriate source of hydration for nearly all types of less vigorous activities. The statement also raised concerns about caffeine and other additives in popular energy drinks.³⁰

The New Nutrition Standards

For the first time since 1970 when the obesity epidemic took root, Congress recently gave the USDA authority to establish nutrition standards for foods sold on campus during the school day. Lacking federal standards, a patchwork of state and local regulations of varying strength have been put in place over the past decade.^{29,31} The new federal nutrition standards for competitive foods sold in schools, titled “Smart Snacks in School,” were proposed in February 2013 and adopted in June 2013 after receiving more than 250 000 comments from the public (<http://www.gpo.gov/fdsys/pkg/FR-2013-06-28/pdf/2013-15249.pdf>). These standards were implemented in 2014.

The USDA Food and Nutrition Service formulated the nutrition standards from several sources. Most prominent

was an IOM report titled “Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth.”³² The IOM concluded that to achieve dietary stability for children and at the same time maintain a financial footing for the school food service, competitive foods of low nutrient value should be significantly curtailed. USDA review of existing state and local standards, as well as of voluntary standards (eg, those developed by the Alliance for a Healthier Generation), augmented the IOM recommendations.

Food Requirements

Under the new standards (http://www.fns.usda.gov/cnd/governance/legislation/allfoods_flyer.pdf), foods sold in schools must have a fruit, a vegetable, a dairy product, or a protein food as its first ingredient; be a whole grain–rich product (>50% whole grain or have whole grain as first ingredient); be a “combination food” containing at least one-quarter cup fruit or vegetable; or contain 10% of the Daily Value of a nutrient of concern occurring naturally (calcium, vitamin D, potassium, or fiber). In this way, the standards directly support the 2010 DGAs. In addition, all foods sold must meet a range of calorie and nutrient requirements. Total fat must be ≤35% of kilocalories, saturated fat must be <10% of kilocalories, and trans fat must be 0 g, as listed on the nutrition facts label. Snack items must contain ≤200 mg of sodium, and entrée items from the school meal programs that are sold as snacks must contain ≤480 mg of sodium per portion. Snack items must contain ≤200 kcal, and entrée items must contain ≤350 kcal per portion. Total sugar content (inherent plus added sugars) is limited to ≤35% of weight per portion as sugars.

Beverage Requirements

Schools may sell plain or carbonated water, unflavored low-fat milk, unflavored or flavored fat-free milk

and milk alternatives (as permitted by the school meal programs), and 100% fruit and/or vegetable juice, with or without carbonation or dilution with water but containing no added sweeteners. Except for water, portion sizes are limited to 8 oz in elementary schools and 12 oz in middle and high schools. High schools may sell additional beverage options, such as calorie-free, flavored, or unflavored carbonated waters or other calorie-free drinks (≤5 kcal per 8-oz serving and up to 10 kcal per 20-oz serving size). In addition, the standards offered 2 alternatives for other beverages in ≤12-oz servings: one is beverages with <40 kcal per 8 oz or ≤60 kcal per 12 oz.

Although most fluids containing added sugars have been curtailed by the new standards, not all added sugars were eliminated. After soft drinks, perhaps the most controversial use of added sugar in schools is in flavored milk, which the new standards allowed, matching the stipulations of the National School Lunch Program and the School Breakfast Program. Consideration of a beverage such as flavored milk provides a good example of the balance needed to limit added sugars and yet promote nutrient-rich foods. Many school districts have chosen to ban flavored milk and opt solely for lower fat nonflavored milks. Consumption patterns of milks among children suggest caution, however.³³ Eliminating the added sugars from milk may increase milk wastage, resulting in fewer ounces consumed per day.^{34,35} Outside of school, whole and 2% milk varieties comprise nearly three-quarters of the milk consumed by children, whereas 1% and nonfat milk combined account for only 20%.³³ Inside schools, flavored milk represents more than 70% of all milk consumed; 38.5% of milk, however, is nonfat and 51% is 1% fat, a substantial decrease in saturated fat and calories relative to consumption patterns outside of school.³⁶ Milk consumption at the

noon meal is critical and is correlated with overall diet quality as well as calcium intake.³⁷ Studies have shown that flavored milk consumption is not associated with weight gain or even a higher total daily sugar intake in children.^{38,39} The 2007 IOM recommendations set a lower standard for the fat and sugar content of flavored milk. Since then, the added sugar content of flavored milks in schools has been reduced by more than 30%, approaching the levels IOM suggested (ie, a maximum of 22 g of total sugars/8 oz, containing 12 g of inherent lactose and 10 g of added sugar).³² Instead of prohibiting sugar-sweetened flavored milk, the new USDA standards direct schools to offer only a nonfat variety, thus cutting calories and saturated fat but still encouraging consumption. This balanced approach recognizes the contribution of fluid milk as the primary source of 3 of the 4 nutrients of concern cited by the 2010 DGAs (calcium, vitamin D, and potassium).

Concerted public and industry efforts, grassroots advocacy, local school wellness policies, and state and federal regulations have resulted in great improvements in nutrition quality in schools. For these efforts to achieve their full potential, however, technical assistance and training (as well as public discussion, ongoing surveillance, regular reappraisal, and continued advocacy) will be required, particularly at the local level.

INFORMAL SOURCES OF FOODS AND BEVERAGES—A NEED FOR IMPROVED QUALITY

As much as 40% of the daily energy consumed by 2- to 18-year-olds is in the form of “empty calories” (energy-dense, nutrient-poor), most of it consumed away from school.^{1,3} However, a substantial portion of low-quality foods make their way into schools from parents, students, teachers, and staff. Packed lunches and snacks, bake sales and booster sales, fundraisers, and class birthdays

and holiday parties traditionally feature candy, sweet or fried desserts, chips, and other snack-type foods and sweetened beverages. Such foods are common rewards for achievement. Sports venues often have refreshments for the players as well as items vended for spectators that are high in calories but low in nutrient value. Although fundraisers do come under the mandate of the new standards for competitive foods sold in schools, the USDA left much of the detail to the discretion of state agencies. Fundraisers occurring during nonschool hours, off campus, or on the weekends are exempt from the new standards. Furthermore, the standards offer an exemption for infrequent fundraisers but left the criteria to state discretion.

Some schools with strong nutrition policies that limited items brought in from home have successfully lessened the likelihood of high consumption of empty calories among students.^{22,23,40} Nutrition education in school and at the point of sale may help students become more savvy consumers. Utilization of research on behavioral economics, which describes the factors that influence an individual’s food selection, may help optimize the presentation of nutrient-rich foods, relative to fewer nutrient options (<http://www.ers.usda.gov/publications/err-economic-research-report/err68.aspx>). Offering alternatives (eg, nonfood items for fundraisers, foods of higher quality) as substitutions for traditional fundraising fare represents an opportunity for pediatricians to join with other child health professionals to influence everyday food choices in local schools (<http://www.actionforhealthykids.org/component/content/article/39-step-3-challenges/636-healthy-a-active-classroom-parties>; www.eatright.org; <http://www.cspinet.org/new/pdf/schoolfundraising.pdf>).

Added sugars offer no nutritional benefits. At the same time, sugars

themselves are not necessarily harmful. Used along with nutrient-rich foods and beverages, sugar can be a powerful tool to increase the quality of a child’s diet. Used in excess, added sugars can add substantially to daily calories. Used at extreme levels (ie, more than 25% to 30% of total calories), sugars can displace other nutrients, resulting in nutrient deficiencies. Although added sugars are often presumed to be an independent cause of overweight, this claim has not been proven in studies. The DGA Advisory Committee found that “a moderate body of evidence suggests that under isocaloric controlled conditions, added sugars, including sugar-sweetened beverages, are no more likely to cause weight gain than any other source of energy.”² Furthermore, the committee’s evidence review failed to find a causative connection between sugar consumption and type 2 diabetes mellitus, heart disease, or behavioral disorders. Similarly, recent reviews of the relationship between sugar consumption and the nutrient content of the diet found that the association was nonlinear. Even a moderately high intake of added sugars was not necessarily associated with decrements in dietary nutrient intake.^{41–46} Care should be taken when prohibiting sugar-containing products to avoid compromising overall nutrition among children. For example, the American Heart Association, in taking its strong stance against overconsumption of added sugars to ensure diet quality and lessen obesity, qualified its recommendations by stating that, “The form in which added sugars are consumed appears to be an important modifier of the impact of [nutrient] dilution. Soft drinks, sugar, and sweets are more likely to have a negative impact on diet quality, whereas dairy foods, milk drinks, and presweetened cereals may have a positive impact.”⁴⁷ Sugars consumed in nutrient-poor foods and beverages are the primary problem to

be addressed, not simply the sugars themselves.

Registered dietitians, school nurses, and school food service directors are natural collaborators with whom pediatricians can work in advancing a unified perspective on increasing nutrient density (the nutrient-to-calorie ratio of a product) while limiting caloric excess. Often, all 4 professional groups can be represented on a school district's wellness council. The Healthy, Hunger-Free Kids Act of 2010 (Pub L No. 111-296) requires schools to inform and update students, parents, and the public about the content and implementation of local wellness policies and to periodically measure whether their schools are in compliance and making progress toward meeting wellness policy goals. Pediatricians seeking an avenue to be involved in their local community school's nutrition can provide a unique perspective on child nutrition, physical activity, and child development (www.fns.usda.gov/tn/Healthy/wellnesspolicy_tools.html; <http://www.actionforhealthykids.org>; and <http://www.cdc.gov/healthyyouth/npao/strategies.htm>).

Thoughtful guidance for families, students, and school staff should aim to establish a practical perspective on nutrition that avoids both prohibition and overconsumption of added sugars when planning packed lunches, school parties and celebrations, booster sales, and other such occasions. It has been well established and repeatedly demonstrated, particularly by the food industry, that sugars can increase the palatability and desirability of foods. Children, in particular, have a strong liking for more intense sweet.⁴⁸ Consumed within recommended calorie amounts, sweetness can offer an effective tool to promote consumption of nutrient-dense foods and beverages.⁴⁹ To help move all school food items in line with the

2010 DGAs, these attributes should be considered:

- Selected from the fundamental 5 food groups: vegetables, fruits, grains (whole grains), low-fat milk and dairy, and quality protein sources (eg, lean meats, fish, nuts, nut butters, seeds, eggs)
- Promotes a broad variety of food experiences for children and adolescents
- Avoids highly processed foods (ie, energy dense with a high calorie content per weight of food), relying instead on fresh components high in water content whenever possible
- Uses the minimum amount of added sugar necessary to promote the palatability, enjoyment, and consumption of nutrient-rich food items
- Adheres to the directives and portion size recommendations offered in the recent USDA nutrition standards for competitive foods, as discussed previously

Additional improvements in nutrient density of sweet-tasting products could be obtained if nonnutritive sweeteners are used as a tool to replace added sugars and help lower caloric intake. Several nonnutritive sweeteners have been accepted by the US Food and Drug Administration as safe and have shown good safety over time. However, data are scarce on long-term benefits for weight management in children and adolescents or on the consequences of long-term consumption.⁵⁰ Continued research is needed.

CONCLUSIONS

Pediatricians can influence nutritional quality in schools directly through their participation as parents, as members of the school's wellness council, as consultants, as sports team physicians, as members of the school board, as community advocates for child nutrition, or through the AAP or their state chapters.⁵¹ In addition, physicians

can encourage local schools to achieve national or state recognition for their wellness efforts, as exemplified by the USDA's Healthier US Schools Challenge (<http://www.fns.usda.gov/tn/healthierus/index.html>). Counseling families and schools to seek a higher diet quality first, then to use the limited amounts of acceptable discretionary calories in a thoughtful way, offers an effective tool to achieve the goals of the DGAs in school.

RECOMMENDATIONS

1. Pediatricians should offer a clear perspective for students, parents, and school officials, based on national nutrition goals, the evidence review of the 2010 DGAs, and the recent nutrition guidelines for schools. The primary objective should be to maximize nutrient density (nutrients consumed per kilocalorie) within recommended calorie ranges, which represents a balance between reducing excess calories, solid fats, added sugars, and sodium while using available discretionary calories to encourage greater consumption of nutrient-rich foods and beverages.
2. Particularly at the local level, pediatricians should acknowledge the substantial gains made by the school nutrition staff on school meals while supporting the full implementation of the recent USDA guidelines both for school meals and for competitive foods sold in schools.
3. Pediatricians should focus particular attention on counseling families and local school staff about improving the quality of selections brought into schools for packed lunches and snacks, fundraisers, sporting events, in-class parties, and school celebrations. By identifying the attributes of nutrient-rich foods, pediatricians can influence food choices and, at the same time, offer families and

schools a practical, holistic perspective on child nutrition.

- In schools, pediatricians should consider wellness councils or school health advisory councils as a unique opportunity for influencing student nutrition through collaboration with other professionals invested in child nutrition, especially registered dietitians, school nurses, and school food service directors. Development of policies and practices with the involvement of students and staff can be a potent form of education about quality nutrition.
- Advocacy efforts of the AAP and its member pediatricians within their state chapters and local school districts should continue to support the efforts of the USDA to improve the school nutrition environment as the best means to ensure the nutritional adequacy of all school-aged children and adolescents.

LEAD AUTHORS

Robert Murray, MD, FAAP
Jatinder J. S. Bhatia, MD, FAAP

COUNCIL ON SCHOOL HEALTH EXECUTIVE COMMITTEE, 2013–2014

Jeffrey Okamoto, MD, FAAP, Chairperson
Mandy Allison, MD, MSPH, FAAP
Richard Ancona, MD, FAAP
Elliott Attisha, DO, FAAP
Cheryl De Pinto, MD, MPH, FAAP
Breena Holmes, MD, FAAP
Chris Kjolhede, MD, MPH, FAAP
Marc Lerner, MD, FAAP
Mark Minier, MD, FAAP
Adrienne Weiss-Harrison, MD, FAAP
Thomas Young, MD, FAAP

PAST EXECUTIVE COMMITTEE MEMBERS

Cynthia Devore, MD, FAAP, Immediate Past Chairperson
Stephen Barnett, MD, FAAP[†]
Robert Murray, MD, FAAP, Past Chairperson

LIAISONS

Linda Grant, MD, MPH, FAAP – *American School Health Association*
Veda Johnson, MD, FAAP – *School-Based Health Alliance*
Elizabeth Matthey, MSN, RN, NCSN – *National Association of School Nurses*

Mary Vernon-Smiley, MD, MPH, MDiv – *Centers for Disease Control and Prevention*

PAST LIAISONS

Carolyn Duff, RN, MS, NCSN – *National Association of School of Nurses*

STAFF

Madra Guinn-Jones, MPH

COMMITTEE ON NUTRITION, 2013–2014

Stephen R. Daniels, MD, PhD, FAAP, Chairperson
Steven A. Abrams, MD, FAAP
Mark R. Corkins, MD, FAAP
Sarah D. de Ferranti, MD, FAAP
Neville H. Golden, MD, FAAP
Sheela N. Magge, MD, FAAP
Sarah Jane Schwarzenberg, MD, FAAP

ADDITIONAL CONTRIBUTOR

Jatinder J. S. Bhatia, MD, FAAP, Past Chairperson

LIAISONS

Jeff Critch, MD – *Canadian Pediatric Society*
Laurence Grummer-Strawn, PhD – *Centers for Disease Control and Prevention*
Rear Admiral Van S. Hubbard, MD, PhD, FAAP – *National Institutes of Health*
Benson M. Silverman, MD[†] – *Food and Drug Administration*
Valery Soto, MS, RD, LD – *US Department of Agriculture*

STAFF

Debra L. Burrowes, MHA

[†]Deceased.

REFERENCES

- Williams C; Dietary Guidelines Advisory Committee. Children's Dietary Intakes. Available at: www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/DGAC/Report/Resource1-Children.pdf. Accessed June 4, 2013
- US Department of Agriculture, Center for Nutrition Policy and Promotion. Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010. Available at: www.cnpp.usda.gov/dgas2010-dgacreport.htm. Accessed June 4, 2013
- Reedy J, Krebs-Smith SM. Dietary sources of energy, solid fats, and added sugars among children and adolescents in the United States. *J Am Diet Assoc.* 2010;110(10):1477–1484
- Institute of Medicine, Food and Nutrition Board. In: Miller EA, ed. *Accelerating Progress in Obesity Prevention: Solving*

the Weight of the Nation. Glickman D, Parker L, Sim LJ, Del Valle Cook H, eds. Washington, DC: National Academies Press; 2012. Available at: http://books.nap.edu/openbook.php?record_id=13275. Accessed June 4, 2013

- US Department of Agriculture and US Department of Health and Human Services. Dietary Guidelines for Americans, 2010. Available at: www.cnpp.usda.gov/dietaryguidelines.htm. Accessed June 4, 2013
- Freeland-Graves JH, Nitzke S. Position of the Academy of Nutrition and Dietetics: total diet approach to healthy eating. *J Acad Nutr Diet.* 2013;113:307–317
- Pennington J, Kandiah J, Nicklas T, Pitman S, Stitzel K. Practice paper of the American Dietetic Association: nutrient density: meeting nutrient goals within calorie needs. *J Am Diet Assoc.* 2007;107(5):860–869
- Gordon AR, Fox MK. *School Nutrition Dietary Assessment Study III: Summary of Findings*. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition, and Analysis; 2006. Available at: www.mathematica-mpr.com/nutrition/schoolmealsstudy.asp. Accessed June 4, 2013
- O'Toole TP, Anderson S, Miller C, Guthrie J. Nutrition services and foods and beverages available at school: results from the School Health Policies and Programs Study 2006. *J Sch Health.* 2007;77(8):500–521
- Institute of Medicine, Food and Nutrition Board. *School Meals: Building Blocks for Healthy Children*. Washington, DC: National Academies Press; 2009
- Clark MA, Fox MK. Nutritional quality of the diets of US public school children and the role of the school meal programs. *J Am Diet Assoc.* 2009;109(suppl 2):S44–S56
- Linz P, Lee M, Bell L. *Obesity, Poverty, and Participation in Nutrition Assistance Programs*. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation; 2005
- Newman C, Ralston K. *Profiles of Participants in the National School Lunch Program: Data From Two National Surveys/EIB-17*. Washington, DC: US

- Department of Agriculture, Economic Research Service; 2006
14. Burghardt JA, Devaney BL, Gordon AR. The School Nutrition Dietary Assessment Study: summary and discussion. *Am J Clin Nutr*. 1995;61(suppl 1):252S–257S
 15. Fox MK, Crepinsek MK, Connor P, Battaglia M. *School Nutrition Dietary Assessment Study II: Summary of Findings*. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition, and Analysis; 2001. Available at: www.fns.usda.gov/ora/menu/published/CNP/FILES/SNDAll-SummaryofFindings.pdf. Accessed June 4, 2013
 16. Crepinsek MK, Gordon AR, McKinney PM, Condon EM, Wilson A. Meals offered and served in US public schools: do they meet nutrient standards? *J Am Diet Assoc*. 2009;109(suppl 2):S31–S43
 17. Newman C, Ralston K, Clauson A. Balancing nutrition, participation and cost in the National School Lunch Program. *Amber Waves*. 2008;6(4). Available at: <http://webarchives.cdlib.org/sw1vh5dg3r/http://ers.usda.gov/AmberWaves/September08/Features/BalancingNSLP.htm>. Accessed June 4, 2013
 18. Hartline-Grafton H. How competitive foods in schools impact student health, school meal programs, and students from low-income families. *Food Research and Action Council Issue Briefs for Child Nutrition Reauthorization*. June 2010;5: 1–9. Available at: http://frac.org/pdf/CNR05_competitivefoods.pdf. Accessed June 4, 2013
 19. Fox MK, Gordon A, Nogales R, Wilson A. Availability and consumption of competitive foods in US public schools. *J Am Diet Assoc*. 2009;109(suppl 2): S57–S66
 20. Turner L, Chaloupka FJ. Wide availability of high-calorie beverages in US elementary schools. *Arch Pediatr Adolesc Med*. 2011;165(3):223–228
 21. Fox MK, Dodd AH, Wilson A, Gleason PM. Association between school food environment and practices and body mass index of US public school children. *J Am Diet Assoc*. 2009;109(suppl 2): S108–S117
 22. Briefel RR, Crepinsek MK, Cabili C, Wilson A, Gleason PM. School food environments and practices affect dietary behaviors of US public school children. *J Am Diet Assoc*. 2009;109(suppl 2):S91–S107
 23. Briefel RR, Wilson A, Gleason PM. Consumption of low-nutrient, energy-dense foods and beverages at school, home, and other locations among school lunch participants and nonparticipants. *J Am Diet Assoc*. 2009;109(suppl 2): S79–S90
 24. Wharton CM, Long M, Schwartz MB. Changing nutrition standards in schools: the emerging impact on school revenue. *J Sch Health*. 2008;78(5):245–251
 25. Schwartz MB, Novak SA, Fiore SS. The impact of removing snacks of low nutritional value from middle schools. *Health Educ Behav*. 2009;36(6):999–1011
 26. American Academy of Pediatrics Committee on School Health. Soft drinks in schools. *Pediatrics*. 2004;113(1 pt 1): 152–154
 27. American Beverage Association. *Alliance School Beverage Guidelines: Final Progress Report*. Washington, DC: American Beverage Association; March 8, 2010. Available at: https://www.healthiergeneration.org/_asset/qm41p9/SBG-FINAL-PROGRESS-REPORT-March-2010.pdf. Accessed June 4, 2013
 28. Mello MM, Pomeranz J, Moran P. The interplay of public health law and industry self-regulation: the case of sugar-sweetened beverage sales in schools. *Am J Public Health*. 2008;98(4): 595–604
 29. Centers for Disease Control and Prevention (CDC). Availability of less nutritious snack foods and beverages in secondary schools—selected states, 2002–2008. *MMWR Morb Mortal Wkly Rep*. 2009;58(39):1102–1104
 30. Schneider MB, Benjamin HJ; Committee on Nutrition and the Council on Sports Medicine and Fitness. Sports drinks and energy drinks for children and adolescents: are they appropriate? *Pediatrics*. 2011;127(6):1182–1189
 31. Trust for America's Health. "F" as in fat: how obesity threatens America's future. Washington, DC: Trust for America's Health; 2011. Available at: <http://healthyamericans.org/report/88/>. Accessed June 4, 2013
 32. Institute of Medicine, Food and Nutrition Board, Committee on Nutrition Standards for Foods in Schools. *Nutrition Standards for Foods in Schools: Leading the Way Towards Healthier Youth*. Washington, DC: National Academies Press; 2007. Available at: www.nap.edu/catalog/11899.html. Accessed June 4, 2013
 33. Kit BK, Carroll MD, Ogden CL. Low-fat milk consumption among children and adolescents in the United States, 2007–2008. *NCHS Data Brief*. 2011 Sep;(75): 1–8
 34. Quann EE, Adams D. Impact on milk consumption and nutrient intakes from eliminating flavored milk in elementary schools. *Nutrition Today*. 2013;48(3): 127–134
 35. Hanks AS, Just DR, Wansink B. Chocolate milk consequences: a pilot study evaluating the consequences of banning chocolate milk in school cafeterias. *PLoS One*. 2014;9(4):e91022
 36. Condon EM, Crepinsek MK, Fox MK. School meals: types of foods offered to and consumed by children at lunch and breakfast. *J Am Diet Assoc*. 2009;109(suppl 2):S67–S78
 37. Johnson RK, Panely C, Wang MQ. The association between noon beverage consumption and diet quality of school-age children. *J Child Nutr Manag*. 1998; 22(2):95–100
 38. Johnson RK, Frary C, Wang MQ. The nutritional consequences of flavored-milk consumption by school-aged children and adolescents in the United States. *J Am Diet Assoc*. 2002;102(6):853–856
 39. Murphy MM, Douglass JS, Johnson RK, Spence LA. Drinking flavored or plain milk is positively associated with nutrient intake and is not associated with adverse effects on weight status in US children and adolescents. *J Am Diet Assoc*. 2008;108(4):631–639
 40. Finkelstein DM, Hill EL, Whitaker RC. School food environments and policies in US public schools. *Pediatrics*. 2008; 122(1). Available at: www.pediatrics.org/cgi/content/full/122/1/e251
 41. Institute of Medicine. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academies Press; 2002. Available at: www.iom.edu/Reports/2006/Dietary-Reference-Intakes-Essential-Guide-Nutrient-Requirements.aspx. Accessed October 23, 2012

42. Frary CD, Johnson RK, Wang MQ. Children and adolescents' choices of foods and beverages high in added sugars are associated with intakes of key nutrients and food groups. *J Adolesc Health*. 2004; 34(1):56–63
43. Marriott BP, Olsho L, Hadden L, Connor P. Intake of added sugars and selected nutrients in the United States, National Health and Nutrition Examination Survey (NHANES) 2003-2006. *Crit Rev Food Sci Nutr*. 2010;50(3):228–258
44. Gibson SA. Dietary sugars intake and micronutrient adequacy: a systematic review of the evidence. *Nutr Res Rev*. 2007;20(2):121–131
45. Rennie KL, Livingstone MB. Associations between dietary added sugar intake and micronutrient intake: a systematic review. *Br J Nutr*. 2007;97(5):832–841
46. Gaesser GA. Carbohydrate quantity and quality in relation to body mass index. *J Am Diet Assoc*. 2007;107(10):1768–1780
47. Johnson RK, Appel LJ, Brands M, et al; American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism and the Council on Epidemiology and Prevention. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. *Circulation*. 2009;120(11):1011–1020
48. Mennella JA, Ventura AK. Early feeding: setting the stage for healthy eating habits. *Nestle Nutr Workshop Ser Pediatr Program*. 2011;68:153–163, discussion 164–168
49. Drewnowski A. Taste preferences and food intake. *Annu Rev Nutr*. 1997;17:237–253
50. Foreyt J, Kleinman R, Brown RJ, Lindstrom R. The use of low-calorie sweeteners by children: implications for weight management. *J Nutr*. 2012;142(6): 1155S–1162S
51. Devore CD, Wheeler LS; Council on School Health; American Academy of Pediatrics. Role of the school physician. *Pediatrics*. 2013;131(1):178–182