

CITIZEN PETITION

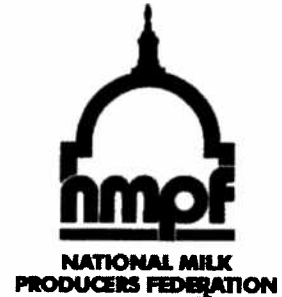
International Dairy Foods Association

National Milk Producers Federation

March 16, 2009



International Dairy Foods Association
Milk Industry Foundation
National Cheese Institute
International Ice Cream Association



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March 16, 2009

Division of Dockets Management
Food and Drug Administration
5630 Fishers Lane, Room 1061 (HFA-305)
Rockville, MD, 20852

CITIZEN PETITION

The undersigned, International Dairy Foods Association (“IDFA”) and National Milk Producers Federation (“NMPF”) submit this petition under sections 401 and 701(e) of the Federal Food, Drug, and Cosmetic Act (“FD&C Act”), 21 U.S.C. §§ 341 and 371(e), to request the Food and Drug Administration (“FDA” or the “agency”) to amend the standard of identity for milk, 21 C.F.R. § 131.110, to include optional characterizing flavoring ingredients with any safe and suitable sweetener. In the interest of administrative efficiency, IDFA also requests that the agency amend the standards of identity for seventeen additional dairy products to provide for the use of any safe and suitable sweetener in these products as well.

IDFA represents the nation's dairy manufacturing and marketing industries and their suppliers, with a membership of 570 companies representing a \$90 billion a year industry. IDFA's members manufacture more than 85 percent of milk produced and marketed in the United States.

The National Milk Producers Federation, based in Arlington, VA, develops and carries out policies that advance the well being of dairy producers and the cooperatives they own. The members of NMPF's 31 cooperatives produce the majority of the U.S. milk supply, making NMPF the voice of more than 40,000 dairy producers on Capitol Hill and with government agencies.

A. Action Requested

IDFA and NMPF request the agency to amend the standard of identity for milk, 21 C.F.R. § 131.110, as follows:

§ 131.110 Milk

...

(c) *Optional ingredients.* The following safe and suitable ingredients may be used.

- (1) Carriers for vitamins A and D.
- (2) Characterizing flavoring ingredients (with or without coloring, **any safe and suitable** sweetener, emulsifiers, and stabilizers) as follows:
 - (i) Fruit and fruit juice (including concentrated fruit and fruit juice).
 - (ii) Natural and artificial food flavorings.

The attached appendix contains the requested revised language for the additional dairy product standards as conforming changes: acidified milk (21 C.F.R. § 131.111), cultured milk (21 C.F.R. § 131.112), sweetened condensed milk (21 C.F.R. § 131.120), nonfat dry milk (21 C.F.R. § 131.125), nonfat dry milk fortified with vitamins A and D (21 C.F.R. § 131.127), evaporated milk (21 C.F.R. § 131.130), dry cream (21 C.F.R. § 131.149), heavy cream (21 C.F.R. § 131.150), light cream (21 C.F.R. § 131.155), light whipping cream (21 C.F.R. § 131.157), sour cream (21 C.F.R. § 131.160), acidified sour cream (21 C.F.R. § 131.162), eggnog (21 C.F.R. § 131.170), half-and-half (21 C.F.R. § 131.180), yogurt (21 C.F.R. § 131.200), lowfat yogurt (21 C.F.R. § 131.203), and nonfat yogurt (21 C.F.R. § 131.206).

B. Statement of Grounds

Promoting more healthful eating practices and decreasing childhood obesity is one of the most pressing problems facing our country today. One small but valuable step towards achieving that goal would be to update the FDA's standard of identify for "milk" to include flavored milk (e.g., chocolate milk) that is sweetened with any "safe and suitable" sweetener, not just with sugar or other nutritive sweetener. Milk is a nutritious beverage and the leading source of calcium. The Dietary Guidelines have recommended increased milk consumption by children and teenagers.

Yet, consumption of milk in schools is declining. Studies have shown that school-age children are more likely to consume flavored milk over regular milk, so if the downward trend in milk consumption in schools is to be reversed, there need to be better options available for lower calorie flavored milk. This can be readily achieved by providing milk producers the option of using any "safe and suitable" sweetener in flavored milk—and still call the product "milk."

The FDA has already updated the ice cream standard for just this very purpose. Doing the same for milk would: (a) incorporate into the standard the ability to use several new sweeteners that have been approved by the FDA since the milk standard of identity was promulgated; (b) promote the public health by providing for a lower calorie, nutritious food consumed largely by children; (c) and meet the laudatory goals of several new legislative initiatives aimed at improving the nutrition and health profile of food served in our nation's schools.

Finally, updating the food standard of identify for “milk” in this way would promote honesty and fair dealing in the interest of milk consumers by facilitating the sale of flavored milk containing less sugar and fewer calories from sweeteners than the flavored products currently labeled as “milk.”

Additional information in support of this Petition is provided below.

1. The Petition Would Permit the Use in Flavored “Milk” of New Sweeteners Approved by FDA and Widely Used in the Food and Beverage Industries.

Although the food and beverage industry has developed a number of FDA-approved non-nutritive sweeteners (low or no calorie sweeteners used as sugar substitutes), the standard of identity for milk has not been modified to reflect these developments. In the 1950s, FDA issued standards of identity for milk products including cream, evaporated milk, concentrated milk, sweetened condensed milk, and dried skim milk. 21 C.F.R. § 131.18 (1956). In the 1970s, a standard of identity was added for flavored and unflavored milk, which permitted processors to use nutritive sweeteners to flavor products labeled as “milk.” At the time, saccharin was the only non-nutritive sweetener available in the United States, and its continued use was uncertain. Kathleen Meister, Sugar Substitutes and Your Health, American Council for Science and Health, Inc. 1, 10 (2006), available at http://www.acsh.org/docLib/20060417_sugar_web.pdf (Attachment A). As a result, the milk standard was drafted to include “characterizing flavoring ingredients (with or without coloring, *nutritive sweetener*, emulsifiers, and stabilizers)” as optional ingredients in milk. 21 C.F.R. § 131.18.2 (1974) (emphasis added). Processors could use nutritive sweeteners, *i.e.* sucrose, to flavor milk. They could not, however, use non-nutritive sweeteners in products labeled “milk.”

Since the 1970s, at least five non-nutritive sweeteners have been found safe by FDA and are permitted for use in foods and beverages, including juice beverages and diet soda. The sweeteners include: aspartame (“NutraSweet™”), sucralose (“Splenda™”), acesulfame-K (“Ace-K”), neotame, and saccharin. Aspartame is approved as a food additive for use as a sweetening agent and flavor enhancer in foods. 21 C.F.R. § 172.804. FDA only restricts the amount of aspartame that can be used in baked goods, baking mixes, or as a sugar substitute tablet. *Id.* Sucralose, acesulfame-K, and neotame are approved food additives for use in food generally, in accordance with current good manufacturing practice and in amounts not to exceed that reasonably required to accomplish the intended technical effect. *Id.* §§ 172.800, 172.829, 172.831. Saccharin may be added to beverages to achieve a valid dietary purpose in amounts not to exceed 12 milligrams per ounce or for an authorized technological purpose other than calorie reduction. *Id.* § 180.37.

The standard of identity for milk should be amended to account for the development of these safe, non-nutritive sweeteners that can serve as a sugar substitute in flavored milk. There is ample precedent among dairy products for FDA to take this action. In 1995, FDA similarly amended the standard for ice cream to allow for “any safe and suitable sweetener” to be used in ice cream rather than only “nutritive carbohydrate sweeteners.” 59 Fed. Reg. 47,072 (Sept. 14, 1994). As a result, non-nutritive sweeteners, such as aspartame and acesulfame-K, may be used in the manufacture of products labeled as “ice cream.” Likewise, permitting milk manufacturers

to use non-nutritive sweeteners in products labeled as “milk” would increase the availability of nutritious, flavored milks with lower calories than current flavored milks. This petition is consistent with FDA’s modification of the ice cream standard and its efforts to revise outdated regulatory restrictions that discourage the marketing of new food products with lower calorie content.

2. The Petition Would Promote Public Health by Providing Consumers with Lower Calorie Versions of Flavored “Milk.”

Milk provides children with a wide variety of vitamins and minerals and is recommended as part of their daily diet. Furthermore, children are more inclined to drink flavored milk than unflavored milk at school. Milk flavored with non-nutritive sweetener has a lower calorie content than milk flavored with nutritive sweetener. Therefore, this petition serves FDA’s policy objective of promoting healthy lifestyles by encouraging the marketing of lower calorie, nutritious, flavored milks to school-aged children.

Milk is a key source of macronutrients, magnesium, phosphorus, vitamin D, vitamin A, riboflavin, vitamin B₁₂, zinc, and potassium for children and teenagers. Mary M. Murphy et al., Drinking Flavored or Plain Milk is Positively Associated with Nutrient Intake and Is Not Associated with Adverse Effects on Weight Status in U.S. Children and Adolescents, 108 J. Am. Diet. Assoc. 631, 631 (2008) (Attachment B). Milk also provides the most important source of calcium in children’s diets and accounts for 75 percent of the calcium available in the U.S. food supply. Rachel K. Johnson et al., The Nutritional Consequences of Flavored-Milk Consumption by School-Aged Children and Adolescents in the United States, 102 J. Am. Diet. Assoc. 853, 853 (2002) (Attachment C). Although the Dietary Guidelines for Americans recommend children of ages two to nine consume two cups of fat-free or low-fat milk per day, only about one third to one half of American children meet that recommendation. Id. The Dietary Guidelines also recommend people ages nine and older consume three servings of dairy per day, but only one third of adolescent boys and fewer than one in five girls consume this recommended amount. Id.

Flavored milk served in schools is particularly valuable in child and adolescent nutrition efforts. Servings of unflavored and flavored milk provide essentially identical amounts of protein, calcium, phosphorus, magnesium, vitamin A, riboflavin, and potassium. Murphy, supra, at 631-32. Furthermore, children greatly prefer flavored milk over unflavored milk. About 70 percent of all milk consumed in schools is flavored. When the New York City health department recently limited flavored milk sales in a group of test schools, overall milk consumption in the schools declined by ten to fifteen percent. Id. According to relevant research, compared to their peers, children who drink flavored milk drink more milk overall and are more likely to meet their calcium needs without consuming more total fat and calories. Johnson, supra, at 855. As a result, these children get more of the nutrients they need for healthy growth and development.

In spite of its nutritional benefits, milk flavored with nutritive sweeteners has a higher calorie content from sugar than plain milk. A serving of low-fat plain milk provides approximately 100 calories whereas a serving of low-fat flavored milk made with nutritive sweeteners contains approximately 160 calories. Murphy, supra, at 632.

Milk flavored with non-nutritive sweetener promotes public health by offering children and adolescents a beverage they are more likely to consume than plain milk and that has all of the nutritional benefits of milk and less sugar than milk flavored with nutritive sweetener. Whether milk is flavored with a non-nutritive sweetener, such as aspartame, or a nutritive sweetener, such as sucrose, there is no difference in the amount of flavored milk that children consume. J.F. Wilson, Lunch Eating Behavior of Preschool Children, 70 *Physiol. Behav.* 27, 29 (2000) (Attachment D). Overall, however, more calories are consumed by children who drink sucrose-sweetened milk instead of aspartame-sweetened milk. Id. Because milk flavored with non-nutritive sweetener has fewer calories and as much nutritional value as other products labeled “milk,” this petition is consistent with FDA’s objective to help children and youth develop healthy eating habits that will last a lifetime.

3. The Petition Responds to Recent Legislative Developments Aimed to Improve the Nutritional Profile of Foods Served in Our Nation’s School.

Since FDA adopted a standard of identity for milk, concern for the growing childhood obesity epidemic has created heightened scrutiny of the foods and beverages marketed and sold to children in schools. States are reviewing and adopting guidelines limiting the amount of sugar and/or calories beverages, including flavored milk, may contain. For instance, according to the Maryland State Department of Education, flavored milk sold during the school day must contain no more than 30 grams of sugar per eight ounce serving. Memorandum from Robin Ziegler, School and Community Nutrition Program Chief, Maryland State Department of Education, to All School Food Authorities 1, 3 (Mar. 2005), available at <http://www.marylandpublicschools.org/NR/rdonlyres/C1ED4EE4-0BE6-4230-82A5-66D4E1C5FEE3/11687/MOM0120305.pdf> (Attachment E). The Pennsylvania Department of Education has a similar policy for competitive foods that schools must meet in order to receive reimbursements in the School Lunch Program. Nutrition Standards for Competitive Foods in Pennsylvania Schools 4, 7 (July, 27, 2007), available at http://www.pde.state.pa.us/food_nutrition/lib/food_nutrition/nutrition_guidelines_r_3_-final.pdf (Attachment F).

Proposed guidelines would restrict the calorie content of milk even further. The School Nutrition Association advocates a limit of 28 grams of sugar (approximately 140 to 170 calories) per eight ounce serving of milk. School Nutrition Assoc., National Nutrition Standards Recommendations (Dec. 8, 2008), available at http://www.schoolnutrition.org/uploadedFiles/School_Nutrition/16_LegislativeAction/SNA_National_Nutrition_Standards.pdf (Attachment G). Likewise, Alliance for a Healthier Generation supports a 150-calorie limit, or 24 to 28 grams of sugar per eight ounce serving of milk. Memorandum from Alliance for a Healthier Generation to the American Heart Association et al. (May 3, 2006), available at http://www.healthiergeneration.org/uploadedFiles/Industry/supporting_documents/MOU%20050206%20FINAL.pdf (Attachment H). The most stringent calorie restriction has been proposed by the Institute of Medicine (“IOM”), which recommends a limit of 22 grams of sugar (120 to 140 calories) per eight ounce serving of milk. Institute of Medicine, Report Brief: Nutritional Standards for Foods in Schools: Leading the Way Toward Healthier Youth, 1, 3-4 (Apr. 2007), available at <http://www.iom.edu/CMS/3788/30181/42502.aspx> (Attachment I). Only milk flavored with a non-nutritive sweetener meets these calorie restrictions while providing students with a tasty and nutritious alternative to diet sodas, juices, and other beverages. Grant of this

petition would ensure students have access to a fuller range of nutritious, lower calorie beverages.

4. The Petition Would Promote Honesty and Fair Dealing in the Marketplace.

Granting this petition would promote honesty and fair dealing by creating consistency in the names of flavored milk products. The limitation on the use of sweeteners contained in the standard of identity for milk creates the potential for consumer confusion. The current milk standard permits nutritive sweeteners to be used as an optional ingredient for flavoring milk. The standard, however, prevents food processors from marketing as flavored milk without further qualification (e.g., “reduced calorie chocolate milk”) for milk made with non-nutritive sweeteners. However, use of the phrase “reduced calorie” is not attractive to children and contributed to the overall decline in milk consumption.

Unlike ice cream, consumers do not recognize milk as a product that necessarily contains sugar. When FDA amended the ice cream standard to include any “safe and suitable sweetener” in products labeled as “ice cream,” the agency also required that non-nutritive sweeteners used in the products be declared as part of the name of the ice cream (i.e. “reduced fat ice cream sweetened with aspartame”) for a period of three years until consumers became aware of the fact that some ice cream products are made with non-nutritive sweeteners. 59 Fed. Reg. 47,072 (Sept. 14, 1994). FDA reasoned that ice cream is a product that traditionally includes ice, milk, and sugar, and consumers have an expectation that the ice cream they purchase also includes those ingredients.

In contrast, consumers do not recognize milk or even flavored milk as a beverage that contains substantial amounts of sugar. Rather, milk is viewed as a healthy drink, particularly for school-aged children. Children and adolescents are the largest consumer of flavored milk, but as consumers, they are not inclined to recognize that the milk they drink contains added sugar. Milk flavored with non-nutritive sweetener, which has less sugar than other flavored milk, provides the same nutritional benefits as other flavored labeled “milk” but with fewer calories. Thus, milk flavored with non-nutritive sweeteners should be labeled as “milk” without further qualification so that consumers can more easily identify its overall nutritional value.

5. Conforming Amendments and Administrative Efficiency

The additional standards listed in the attached appendix should also be changed as conforming amendments. For purposes of administrative efficiency, as long as the agency is using the time and resources to amend the standard of identity for milk to provide for safe and suitable sweeteners and having already amended the standard of identity for ice cream, it is sensible to amend the standards of identity for the additional dairy products at the same time. Furthermore, because the standards for the additional dairy products present the same issues as the milk standard with respect to safe and suitable sweeteners, it is most efficient to consider them all together.

C. Environmental Impact

Preparation of an environmental assessment is not required for a petition to establish or amend a food standard. 21 C.F.R. § 25.32(a).

D. Certification

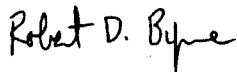
The undersigned certifies that, to the best knowledge and belief of the undersigned, this petition includes all information and views on which the petition relies, and it includes representative data and information known to the petitioner which are unfavorable to the petition.

Pursuant to 21 C.F.R. § 130.5(c) (2008), petitioner commits to substantiate the information in the petition by evidence in a public hearing, if such a hearing becomes necessary.

Respectfully Submitted,



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APPENDIX

§ 131.111 Acidified milk.

(e) *Other optional ingredients.*

...

- (2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup, dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

§ 131.112 Cultured milk.

(d) *Other optional ingredients.*

...

- (2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup, dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

§ 131.120 Sweetened condensed milk.

- (b) *Optional ingredients.* The following safe and suitable characterizing flavoring ingredients, with or without coloring and **any safe and suitable** sweeteners, may be used:

- (1) Fruit and fruit juice, including concentrated fruit and fruit juice.
- (2) Natural and artificial food flavoring.

§ 131.125 Nonfat dry milk.

- (b) *Optional ingredients.* Safe and suitable characterizing flavoring ingredients (with or without coloring and **any safe and suitable**

sweetener) as follows:

- (1) Fruit and fruit juice, including concentrated fruit and fruit juice.
- (2) Natural and artificial food flavorings.

§ 131.127 Nonfat dry milk fortified with vitamins A and D.

(c) *Optional ingredients.* The following safe and suitable optional ingredients may be used:

- (1) Carriers for vitamins A and D.
- (2) Characterizing flavoring ingredients, with or without coloring and **any safe and suitable** sweetener, as follows:
 - (i) Fruit and fruit juice, including concentrated fruit and fruit juice.
 - (ii) Natural and artificial food flavorings.

§ 131.130 Evaporated milk.

(c) *Optional ingredients.* The following safe and suitable ingredients may be used:

- (1) Carriers for vitamins A and D.
- (2) Emulsifiers.
- (3) Stabilizers, with or without dioctyl sodium sulfosuccinate (when permitted by and complying with the provisions of Sec. 172.810 of this chapter) as a solubilizing agent.
- (4) Characterizing flavoring ingredients, with or without coloring and **any safe and suitable** sweeteners, as follows:
 - (i) Fruit and fruit juice, including concentrated fruit and fruit juice.
 - (ii) Natural and artificial food flavoring.

§ 131.149 Dry cream.

(b) *Optional ingredients.* The following safe and suitable optional

ingredients may be used:

- (1) Emulsifiers.
- (2) Stabilizers.
- (3) Anticaking agents.
- (4) Antioxidants.
- (5) **Any safe and suitable** sweeteners.
- (6) Characterizing flavoring ingredients, with or without coloring, as follows:
 - (i) Fruit and fruit juice, including concentrated fruit and fruit juice.
 - (ii) Natural and artificial food flavoring.

§ 131.150 Heavy cream.

(b) *Optional ingredients.* The following safe and suitable optional ingredients may be used:

- (1) Emulsifiers.
- (2) Stabilizers.
- (3) **Any safe and suitable** sweeteners.
- (4) Characterizing flavoring ingredients (with or without coloring) as follows:
 - (i) Fruit and fruit juice (including concentrated fruit and fruit juice).
 - (ii) Natural and artificial food flavoring.

§ 131.155 Light cream.

(b) *Optional ingredients.* The following safe and suitable ingredients may be used:

- (1) Stabilizers.

(2) Emulsifiers.

(3) **Any safe and suitable** sweeteners.

(4) Characterizing flavoring ingredients (with or without coloring) as follows:

(i) Fruit and fruit juice (including concentrated fruit and fruit juice).

(ii) Natural and artificial food flavoring.

§ 131.157 Light whipping cream.

(b) *Optional ingredients.* The following safe and suitable optional ingredients may be used:

(1) Stabilizers.

(2) Emulsifiers.

(3) **Any safe and suitable** sweeteners.

(4) Characterizing flavoring ingredients (with or without coloring) as follows:

(i) Fruit and fruit juice (including concentrated fruit and fruit juice).

(ii) Natural and artificial food flavoring.

§ 131.160 Sour cream.

(b) *Optional ingredients.* (1) Safe and suitable ingredients that improve texture, prevent syneresis, or extend the shelf life of the product.

(2) Sodium citrate in an amount not more than 0.1 percent may be added prior to culturing as a flavor precursor.

(3) Rennet.

(4) **Any safe and suitable** sweeteners.

(5) Salt.

(6) Flavoring ingredients, with or without safe and suitable coloring, as follows:

- (i) Fruit and fruit juice (including concentrated fruit and fruit juice).
- (ii) Safe and suitable natural and artificial food flavoring.

§ 131.162 Acidified sour cream.

(b) *Optional ingredients.* (1) Safe and suitable ingredients that improve texture, prevent syneresis, or extend the shelf life of the product.

(2) Rennet.

(3) **Any safe and suitable** sweeteners.

(4) Salt.

(5) Flavoring ingredients, with or without safe and suitable coloring, as follows:

- (i) Fruit and fruit juice, including concentrated fruit and fruit juice.
- (ii) Safe and suitable natural and artificial food flavoring.

§ 131.170 Egnog.

(2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup, dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

§ 131.180 Half-and-half.

(b) *Optional ingredients.* The following safe and suitable optional ingredients may be used:

(1) Emulsifiers.

(2) Stabilizers.

- (3) **Any safe and suitable** sweeteners.
- (4) Characterizing flavoring ingredients (with or without coloring) as follows:
 - (i) Fruit and fruit juice (including concentrated fruit and fruit juice).
 - (ii) Natural and artificial food flavoring.

§ 131.200 Yogurt.

(d) Other optional ingredients.

...

- (2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup, dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

§ 131.203 Lowfat yogurt.

(d) Other optional ingredients.

...

- (2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup, dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

§ 131.206 Nonfat yogurt.

(d) Other optional ingredients.

...

- (2) Nutritive carbohydrate sweeteners. Sugar (sucrose), beet or cane; invert sugar (in paste or sirup form); brown sugar; refiner's sirup; molasses (other than blackstrap); high fructose corn sirup; fructose; fructose sirup; maltose; maltose sirup, dried maltose sirup; malt extract, dried malt extract; malt sirup,

dried malt sirup; honey; maple sugar; or any of the sweeteners listed in part 168 of this chapter, except table sirup.

(3) Any additional safe and suitable sweetener.

List of Attachments

- Attachment A: Kathleen Meister, Sugar Substitutes and Your Health, American Council for Science and Health, Inc. 1-22 (2006).
- Attachment B: Mary M. Murphy et al., Drinking Flavored or Plain Milk is Positively Associated with Nutrient Intake and Is Not Associated with Adverse Effects on Weight Status in U.S. Children and Adolescents, 108 J. Am. Diet. Assoc. 631-639 (2008).
- Attachment C: Rachel K. Johnson et al., The Nutritional Consequences of Flavored-Milk Consumption by School-Aged Children and Adolescents in the United States, 102 J. Am. Diet. Assoc. 853-856 (2002).
- Attachment D: J.F. Wilson, Lunch Eating Behavior of Preschool Children, 70 Physiol. Behav. 27-33 (2000).
- Attachment E: Memorandum from Robin Ziegler, School and Community Nutrition Program Chief, Maryland State Department of Education, to All School Food Authorities, 1-20 (Mar. 2005).
- Attachment F: Nutrition Standards for Competitive Foods in Pennsylvania Schools, 1-20 (July 27, 2007).
- Attachment G: School Nutrition Assoc., National Nutrition Standards Recommendations, 9 pp. (Dec. 8, 2008).
- Attachment H: Memorandum from Alliance for a Healthier Generation to the American Heart Association et al., 5 pp.(May 3, 2006).
- Attachment I: Institute of Medicine, Report Brief: Nutritional Standards for Foods in Schools: Leading the Way Toward Healthier Youth, 1-8 (Apr. 2007).

ATTACHMENT A

Sugar Substitutes and Your Health

By
Kathleen Meister, M.S.

For
The American Council on Science and Health

Project Coordinator
Ruth Kava, Ph.D., R.D.
Director of Nutrition, ACSH

Based on
"Low-Calorie Sweeteners and Other Sugar Substitutes: A Review of the Safety Issues,"
by Manfred Kroger, Ph.D., Kathleen Meister, M.S., and Ruth Kava, Ph.D., R.D.
Published in the online journal,
Comprehensive Reviews in Food Science and Food Safety

Art Director
Jennifer Lee

MAY 2006



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Sugar Substitutes and Your Health

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Executive Summary¹

- Foods and beverages containing sugar substitutes are widely used in the United States and other countries; they offer attractive dietary options for people who are trying to limit calorie intake and/or reduce the risk of tooth decay.
- Extensive scientific research supports the safety of the five low-calorie sugar substitutes currently approved for use in foods and beverages in the U.S. — acesulfame-K, aspartame, neotame, saccharin, and sucralose.
- In several instances, scientific studies have raised questions about the safety of specific sugar substitutes. Concerns about the possible cancer-causing potential of cyclamate and saccharin, raised during the 1960s and 1970s, respectively, have been resolved. A controversial animal cancer study of aspartame is currently being reviewed by regulatory authorities in the United States and other countries.
- Three sugar substitutes currently used in some other countries — alitame, cyclamate, and stevia — are not approved as food ingredients in the United States. Alitame and cyclamate are under consideration for approval. Stevia may be sold as a dietary supplement, but marketing this product as a food ingredient in the U.S. is illegal.
- A variety of polyols (sugar alcohols) and other bulk sweeteners, including two unusual sugars, trehalose and tagatose, are accepted for use in foods in the U.S. The only significant health issue pertaining to these sugar substitutes, most of which are incompletely digested, is the potential for gastrointestinal discomfort with excessive use.
- The availability of a variety of safe sugar substitutes is a benefit to consumers because it enables food manufacturers to formulate a variety of good-tasting sweet foods and beverages that are safe for the teeth and lower in calorie content than sugar-sweetened foods and beverages.

1. The term sugar substitutes includes both food ingredients with very strong sweetening power that provide zero or very few calories, which are used in very small amounts to sweeten foods, and bulk sweetening agents such as polyols, which can replace both the bulk of sugar and some of its sweetness. This booklet discusses both types of sweeteners, with an emphasis on the safety aspects of the five low-calorie sweeteners currently approved for use in the United States.

Introduction

If you enjoy diet soft drinks or other reduced-calorie or “light” products, you’re in good company. According to a recent survey, 180 million American adults use low-calorie, sugar-free foods and beverages. Despite the popularity of these products, though, some people have concerns or questions about the safety of the sugar substitutes that make the products possible. Misinformation about sugar substitutes abounds, especially on the Internet, and people may have difficulty distinguishing trustworthy sources of information on this topic from less reliable ones.

This report by the American Council on Science and Health summarizes the scientific facts about the safety of sugar substitutes. The principal source of information for this booklet was a technical manuscript entitled “Low-Calorie Sweeteners and Other Sugar Substitutes: A Review of the Safety Issues,” published in the journal *Comprehensive Reviews in Food Science and Food Safety*, by Dr. Manfred Kroger of Pennsylvania State University and Kathleen Meister and Dr. Ruth Kava of the American Council on Science and Health.

Sugar Substitutes that Provide Zero or Negligible Calories

The sugar substitutes discussed in this section of this booklet, which may also be called alternative, artificial, high-intensity, or nonnutritive sweeteners, can replace the sweetness of sugar while providing few or no calories. In addition to the calorie savings, these sugar substitutes have the advantage of not promoting tooth decay, and they are useful in dietary planning for people who are coping with obesity or diabetes. Five sweeteners of this type are currently approved for use in foods and beverages in the United States: *acesulfame-K*, *aspartame*, *neotame*, *saccharin*, and *sucralose* (Table 1). Others, including *alitame*, *cyclamate*, and substances derived from the *stevia* plant, are approved as food ingredients in some other countries but not in the United States. Each of these sugar substitutes is discussed individually below.

With the exception of saccharin, which was in use long before current procedures were adopted in the 1950s, each of the sugar substitutes discussed here had to earn approval as a new food additive in the United States. The Food and Drug Administration (FDA) approves new food additives based on reviews of extensive scientific research on safety. Before a new food additive can go on the market, the company that wishes to sell it must petition the FDA for its

Table 1. Low-Calorie Sugar Substitutes Currently Approved for Use in the United States

Sugar Substitute	Caloric Value (Cal/g)	Date Approved	Regulatory Status	Potency (times sweeter than sucrose) ^a	Brand Names
Acesulfame-K	0	1988	Approved as a food additive; ADI ^b = 15 mg/kg bw/day	200	Sunett, Sweet One
Aspartame	4 ^c	1981	Approved as a food additive; ADI = 50 mg/kg bw/day	180	NutraSweet, Equal, others
Neotame	0	2002	Approved as a food additive; ADI = 18 mg/p/day	7,000	Information not yet available
Saccharin	0	In use for decades prior to the Food Additives Amendment of 1958	Permitted for use under an interim regulation	300	Sweet'n Low, Sweet Twin, Sugar Twin, others
Sucralose	0	1998	Approved as a food additive; ADI = 5 mg/kg/day	600	Splenda

a. Potency varies in different food applications. These values should be regarded as rough estimates.

b. ADI = acceptable daily intake, defined as the estimated amount that a person can safely consume on average every day over a lifetime without risk. The ADI values listed here are those established by the U.S. Food and Drug Administration; ADIs used in other countries may be slightly different. ADI values are usually expressed in milligrams per kilogram of body weight per day (mg/kg bw/day); however, FDA has expressed the ADI for neotame in terms of milligrams per person per day (mg/p/day).

c. Although aspartame provides 4 Cal/g, as many calories as an equivalent weight of protein or carbohydrate, the amount of aspartame used in foods and beverages is so small that its caloric contribution is negligible.

approval. The petition must provide convincing evidence that the new additive performs as intended and is safe, where "safe" means a reasonable certainty of no harm under the intended conditions of use. Demonstrating that an additive is safe is the manufacturer's responsibility; it is the manufacturer, not the FDA, who conducts and pays for the necessary research.² FDA's roles are to assess the research results and to make decisions on the submitted petitions; FDA does not decide what substances will be considered as potential food additives, and it does not conduct safety studies. For additives that are likely to be widely used, such as sugar substitutes, the necessary research includes extensive studies in experimental animals, including studies in which high doses of the additive are administered to two species of animals for the greater part of the animals' lifetime. In many instances, studies in human volunteers are also conducted.

2. Opponents of particular food additives sometimes attempt to cast aspersions on them by pointing out that the studies supporting their safety were conducted by the additives' manufacturers. But there is nothing scandalous in this. It is inherent in the way the system for food additive approval works. The alternative (having a government agency or independent entity test food additives for safety) may sound good in theory, but it would require research on prospective new products to be paid for with the public's tax dollars. Under the current system, the company that will benefit financially from the new product pays for the research, and FDA's stringent review process ensures that the studies were properly performed and interpreted.

It can be difficult for people who are not involved in the testing of food additives to appreciate just how extensive their premarket testing must be. Most safety studies on prospective food additives are never published in the scientific literature because they do not make an important contribution to scientific knowledge. One exception, however, involves the sugar substitute sucralose. Many of the more than 100 studies conducted in support of the safety of this additive were published in a scientific journal in 2000 (see the Suggestions for Further Reading at the end of this report). They provide insight into the quantity and sophistication of the research required before a new food additive can be marketed in the United States.

Low- or Zero-Calorie Sugar Substitutes Currently Approved for Use in the United States

Acesulfame-K

Acesulfame-K, sold under the brand name Sunett, is the most successful sugar substitute that you've probably never heard of. It is inconspicuous because it is almost always used in combination with other sweetening agents. When used in this way, it contributes to creating a sweet taste very close to that of sugar. However, if used alone, it can have a bitter aftertaste that consumers would find undesirable. Acesulfame-K is approximately 200 times as sweet as sugar, and it provides zero calories.

As with all new food additives, acesulfame-K underwent extensive safety testing before regulatory authorities in the U.S. and other countries approved its use. More than 50 studies of various aspects of safety were conducted before the FDA approved acesulfame-K for use in dry foods in 1988, and additional tests were conducted before FDA approved its use in beverages a few years later.

Over the years, concerns have been raised about several aspects of the safety of acesulfame-K. All of these issues have been resolved, as follows:

- Questions were raised about one of the animal experiments, a long-term study in rats, that was conducted during the safety testing of acesulfame-K. It has been claimed that this study was inadequate and that its results might have linked acesulfame-K to an increased risk of cancer. There was indeed a problem with this study; an illness had spread through the rat colony while the study was in progress. Because of this complication, it was necessary for

the researchers to repeat the study. The second study was completed with no problems, and it did not link acesulfame-K to cancer or other harmful effects. It was this second study, not the first, that was used by regulatory authorities in their evaluation of acesulfame-K.

- It has been argued that a breakdown product, acetoacetamide, that may form during storage in beverages sweetened with acesulfame-K could have harmful effects. Regulatory authorities are aware of this breakdown product, and they took its formation into account before approving acesulfame-K for use in beverages. Because the amount of acetoacetamide that could form in beverages is extremely small, far too small to cause adverse health effects, the formation of this substance is not considered to be a cause for concern.
- In the late 1990s, researchers from India reported findings that seemed to indicate that acesulfame-K could cause mutations (genetic changes) in mouse bone marrow cells. However, when the same researchers and others attempted to replicate this finding, they were unable to do so. The later studies showed no evidence of mutations, indicating that the original finding was incorrect.

Recent reevaluations of the scientific evidence on acesulfame-K, including a comprehensive review by the food safety authorities of the European Union in 2000, have reaffirmed its safety. No human health problems associated with the consumption of acesulfame-K have been reported in the scientific literature, despite more than 15 years of extensive use in many countries.

Aspartame

Aspartame was discovered in 1965 and approved by the FDA in 1981. It is widely used in foods and beverages because its taste is very close to that of table sugar. During the first years after approval, when aspartame was sold exclusively by the patent holder, it was known primarily by the brand names NutraSweet and Equal (the latter is the popular table-top sugar substitute sold in blue packets). Since the expiration of the patent in December 1992, aspartame has also been sold under other brand names. Aspartame is approximately 180 times as sweet as sugar.

The aspartame molecule consists of two amino acids — phenylalanine and aspartic acid — linked to methanol (methyl alcohol). The two amino acids in aspartame occur naturally in foods as protein components. Methanol also occurs naturally in foods and is produced by the digestion of other food constituents. Aspartame itself does not occur naturally.

Unlike most other low-calorie sugar substitutes, aspartame is broken down in the human body. Enzymes in the digestive tract break it down into its components (phenylalanine, aspartic acid, and methanol), each of which is then metabolized just as it would be if derived from other dietary sources. Because aspartame is metabolized, it provides as many calories as an equivalent weight of protein or carbohydrate does. However, because aspartame is intensely sweet, the amount used in foods and beverages is so small that its caloric contribution is negligible.

As with all modern food additives, aspartame underwent extensive safety testing prior to approval. Many additional studies have been conducted in the decades since aspartame went on the market. On the basis of this scientific evidence, authorities in numerous countries have approved and repeatedly reapproved the use of aspartame. The most recent reevaluations, including a reassessment of aspartame by authorities in the European Union in 2002, have continued to support its safety.

To scientists, it has always seemed unlikely that the normal use of aspartame could cause adverse health effects. Aspartame breaks down in the digestive tract into ordinary food components, and it accounts for only a small proportion of the total intake of these components. Thus, it is difficult to conceive of a mechanism by which the use of normal amounts of aspartame could cause an adverse effect.

Of course, any substance can be harmful if consumed in a large enough quantity. This is true for the components of aspartame, just as it is true for water, vitamins, and numerous other substances in foods and beverages. However, the amounts of phenylalanine, aspartic acid, and methanol in aspartame-sweetened foods and beverages are small — well below the levels that could cause any harm.

It has been calculated that even a relatively heavy user of aspartame (a person at the 90th percentile of aspartame consumption)³ would increase his or her intake of the two amino acids in aspartame — aspartic acid and phenylalanine — by only one to two percent. Such changes are within the range of variation caused by day-to-day differences in food intake and are clearly not harmful. A 90th-percentile consumer of aspartame-sweetened products would increase his

3. The 90th percentile of aspartame consumption is roughly 3.0 milligrams per kilogram of body weight per day. For a 150-lb adult, this would be about 210 milligrams of aspartame, which is approximately the amount in one 12-oz. can of aspartame-sweetened soft drink plus one packet of aspartame-based table-top sweetener. The acceptable daily intake of aspartame (the estimated amount that a person can safely consume on average every day over a lifetime without risk) is 50 milligrams per kilogram of body weight per day, or about 16 times the 90th percentile intake.

or her daily consumption of methanol by an amount only one twenty-fifth of the maximum tolerable level established by the FDA; a small increase of this sort would not cause harmful effects.

Even when aspartame is consumed in unusually large (but physically possible) amounts, adverse health effects do not occur. Aspartame has been tested in human volunteers in single doses four times the acceptable daily intake (the amount considered safe for daily consumption for a lifetime) and in studies where volunteers consumed aspartame daily at a level 50% higher than the acceptable daily intake for several months. Even at these high doses, the levels of all three of aspartame's components in the volunteers' blood remained within safe ranges, and no adverse effects occurred.

Consumers sometimes worry about the presence of methanol in aspartame because they know that methanol, in large doses, is toxic. Many people do not realize that methanol is a common constituent of foods and beverages and that people routinely consume small amounts of it without ill effect. Methanol is found in many fruits and vegetables. Fruit juices contain substantial amounts of methanol; for example, apple juice has been reported to contain up to 88 milligrams per liter. This is not a reason to avoid apple juice, however. To obtain a fatal dose of methanol from apple juice, an individual would have to consume between 100 and 1000 quarts of the juice at a single sitting — an obviously absurd scenario. All fermented foods and beverages, such as alcoholic beverages and fermented milk products, can be expected to contain methanol as well as other alcohols in trace amounts. Except in the case of unprofessionally distilled alcoholic beverages, however, the amount of methanol in fermented foods and beverages is too low to cause any health damage. The same is true of the small amounts of methanol present in aspartame-sweetened foods or beverages.

Foods and beverages that contain aspartame must carry a label statement indicating that the product contains phenylalanine. This statement is for the benefit of individuals with the disease phenylketonuria, who must strictly limit their intake of this amino acid.

Phenylketonuria is a rare disease, affecting approximately one in 15,000 people, that results from a hereditary lack of an enzyme necessary for the normal metabolism of phenylalanine. Unless the disorder is detected in early infancy and treated with a phenylalanine-restricted diet, it results in mental retardation and other severe, permanent effects. Newborn infants in the U.S. and many other countries are screened for phenylketonuria at birth. Because of screening and effective treatment, substantial numbers of people with phenylketonuria are living near-normal lives except for the need for dietary restriction.

The phenylalanine notice on aspartame-sweetened products is not relevant to the general public; it is meant only for people with phenylketonuria. It is much like the statements provided on food labels for the benefit of people with food allergies (e.g., “contains wheat and soy”). Such label statements are intended only for people with a specific problem; they do not imply that consumers in general need to avoid the food.

Aspartame is unstable if subjected to prolonged heating and therefore cannot be used in baking or cooking (unless added at the end of the cooking process). Aspartame also decomposes in liquids during prolonged storage (this is why diet soft drinks have a shelf life about half that of regular soft drinks). When aspartame decomposes, the breakdown products include its three components (the two amino acids and methanol), as well as the diketopiperazine derivative of aspartame, which has been tested for safety and is not regarded as hazardous. The relative instability of aspartame is a quality issue, not a safety issue. For example, if you drink a can of diet soft drink that has been left too long in a hot car, causing some of the aspartame in the beverage to break down, it will not make you sick. However, you may notice a deterioration in the quality of the beverage.

Despite the extensive evidence supporting the safety of aspartame and the very low likelihood that a substance of aspartame’s composition could cause adverse health effects, claims of such effects abound, especially on the Internet. Anyone who enters the term “aspartame” into an Internet search engine will find thousands of references to this substance, including hundreds of Web sites filled with anecdotal reports supposedly linking aspartame with a wide variety of effects — including neurological and behavior problems, multiple sclerosis, systemic lupus erythematosus, fibromyalgia, chronic fatigue syndrome, Alzheimer’s disease, birth defects, and even the health problems experienced by some Gulf War veterans. The scientific evidence does not support any of these alleged associations. A lack of scientific support, however, does not prevent misinformation from being repeated, over and over, on the Internet.

It is important to realize that anyone can publish *anything* on a Web site — including speculation, misconceptions, and unsupported allegations — and that in cyberspace, myths and rumors never die. People who use the Internet as a source of information on health-related issues would be well advised to visit the sites of trusted organizations or government agencies and search the collections of documents posted there rather than searching the Internet as a whole. Further advice on using the Internet as a health information source is given at the end of this report.

There is only one unresolved issue concerning aspartame's safety at the present time. In 2005, a group of Italian researchers reported that a study they had conducted had linked aspartame exposure to an increased risk of cancer in rats. The study was performed using methodology that differs from the standard, well-verified techniques for evaluating the cancer-causing potential of substances in experimental animals, and its findings conflict with those of studies conducted using officially recognized methodology. In addition, the researchers did not follow the customary procedure of allowing a second group of scientists to examine all of the samples of the animals' tissues that had been prepared for microscopic study. Moreover, the research was conducted at a laboratory whose previous work has been criticized as "unreliable" by the FDA. Nevertheless, as is prudent, regulatory authorities in the United States and other countries are carefully reviewing the data from the new study to determine whether the findings are indicative of any real cause for concern about aspartame.

Neotame

Neotame is the newest of the low-calorie sugar substitutes. It was approved in 2002 and has not yet appeared in commercial products in the United States. Like aspartame, neotame contains the amino acids phenylalanine and aspartic acid. The two amino acids, however, are combined in a way that is different from that in aspartame, giving neotame different properties. Neotame is extraordinarily sweet, with a sweetness potency at least 7,000 times that of sugar and at least 30 times that of aspartame. Unlike aspartame, neotame is heat stable and therefore can be used in cooking and baking.

Although neotame is chemically similar to aspartame, it is not the same substance. Therefore, neotame had to be comprehensively tested for safety, just as any other new food additive would, before it was approved by the FDA. The scientific evidence submitted to FDA by neotame's manufacturer in support of its safety included the results of more than 110 scientific studies, including tests in both experimental animals and human volunteers. This is typical of the amount of research that is necessary before a new food additive can be marketed.

When a person consumes neotame, most of it is broken down into a derivative and methanol, both of which are rapidly excreted from the body through either the digestive tract or the urinary tract. Because the amount of neotame used to sweeten a food or beverage is extremely small, the exposure to methanol from neotame is also extremely small in comparison to methanol exposure from other sources. The amount of methanol in a glass of fruit juice is about 100 times that in a glass of a neotame-sweetened soft drink.

Although neotame contains phenylalanine, products sweetened with neotame will not be required to bear a warning notice for people with phenylketonuria, in the way that aspartame-sweetened products do. The amount of phenylalanine in a neotame-sweetened product is so small that it is insignificant, even for people who must limit their phenylalanine intake. The FDA has calculated that the amount of phenylalanine that would be consumed by a person in the 90th percentile of predicted consumption for neotame is only about 0.4 percent of the amount that a child with phenylketonuria is permitted to consume daily. Thus, the effect of consumption of neotame-sweetened products on total phenylalanine intake is negligible.

Neotame is likely to receive increased public attention once products containing it begin to appear on the market. Consumers should be aware that neotame is a safe, well-tested food ingredient.

Saccharin

Saccharin, the oldest low-calorie sugar substitute, was discovered in 1878. It is 300 times sweeter than sugar and provides no calories. In the first half of the twentieth century, saccharin was popular as a sugar substitute in the diets of people with diabetes and other medical conditions. It was also used extensively as a replacement for strictly rationed sugar in Europe during both World Wars. Between 1970 and 1981, saccharin was the only low-calorie sugar substitute available in the United States. Saccharin is still widely used today, often in combination with other sugar substitutes, and owes much of its popularity to its low cost. Although saccharin can have a bitter aftertaste when used alone, it works well in blends with other sugar substitutes. Saccharin is perhaps most familiar to U.S. consumers as the sugar substitute sold in pink packets, under the brand name Sweet'n Low.

During the 1970s, concerns were raised about whether saccharin might be capable of causing human cancer. In several studies in which a particular chemical form of saccharin, sodium saccharin, was administered to rats in extremely large doses for a lifetime, the male rats had an increased rate of bladder cancer. In 1977, on the basis of this evidence, the FDA attempted to ban saccharin. This decision met with an extremely negative reaction from the American public because saccharin was the only low-calorie sugar substitute on the market at that time, and banning it would have meant that diet soft drinks and other sweet low-calorie products would become unavailable. Acting in response to a massive public mandate, Congress passed a law that imposed a moratorium on the proposed FDA action, and saccharin was never banned, although a warning label was required on saccharin-sweetened products.

Since the 1970s, scientific research has shown that saccharin is not a cancer hazard in humans. Researchers have learned that the mechanism by which sodium saccharin causes bladder cancer in rats is not applicable to people. In rats fed high doses of sodium saccharin, crystals form in the urine. These crystals damage bladder tissues, leading to the proliferation of new cells, which increases the risk of cancer. This phenomenon does not occur in humans, whose bladder physiology is quite different from that of rats. Moreover, the effect in rats is not even attributable to saccharin per se — it is caused by the sodium component of sodium saccharin, not the saccharin component. Researchers have been able to produce bladder tumors in male rats by feeding them very high doses of other sodium compounds, too — including sodium chloride (table salt) and sodium ascorbate (one of the chemical forms of vitamin C) — neither of which poses a bladder cancer risk in humans.

The relationship between saccharin and bladder cancer has been evaluated in epidemiological studies (studies of the occurrence of disease in human populations), most of which used the case-control design (i.e., people diagnosed with bladder cancer were compared with people of the same age and sex who did not have the disease to see how their past experiences, including exposure to saccharin, differed). The combined evidence from the many case-control studies indicates that no detectable association exists between saccharin consumption and the risk of bladder cancer in humans.

Because the animal evidence indicates that the mechanism by which saccharin causes cancer in rats is not relevant to humans and because the human evidence does not demonstrate any cancer hazard from the use of saccharin, regulatory agencies and international organizations have removed saccharin from their lists of probable human carcinogens, and the requirement for a warning label on saccharin-sweetened products has been discontinued. There are no unresolved safety issues pertaining to saccharin at the present time. Saccharin is currently permitted for use in the U.S. under an interim regulation that specifies the amounts of saccharin permitted in beverages, processed foods, and table-top sweeteners and requires that the product label must state saccharin in the ingredient declaration and specify the amount used.

Sucralose

Sucralose was discovered in 1976 and approved for use in the United States in 1998. It is made from sucrose (table sugar) by a process that substitutes three chlorine atoms for three hydrogen-oxygen (hydroxyl) groups on the sucrose molecule. Although sucralose is made from sugar, the human body does not recognize it as a sugar and does not obtain energy by breaking it down; in fact, almost all of it is excreted from the body unchanged. Sucralose is about 600

times sweeter than sugar, and it is heat-stable. Like the other low-calorie sugar substitutes, it does not promote tooth decay. It is sold in the U.S. under the brand name Splenda and is perhaps most familiar to U.S. consumers as the sugar substitute that comes in yellow packets.

As is true for all new food additives introduced in recent decades, sucralose underwent extensive safety testing in both experimental animals and human volunteers before it was approved in the United States and other countries. Sucralose is considered safe for all segments of the population, including people with chronic health problems such as diabetes.

In the years since sucralose was approved, some popular products have been reformulated to contain it, often with considerable publicity. During this time, concerns about the safety of sucralose have been raised on various Internet sites, especially those that also express concerns about aspartame. Most of these concerns seem to be based on a general distrust of synthetic food ingredients or a specific unease about any substance that contains chlorine, which is also a component of some pesticides. However, the presence of chlorine in the sucralose molecule is not a cause for concern. Many commonly consumed substances, including table salt (sodium chloride), contain chlorine; the presence of this element in a compound does not indicate that the compound is toxic. Sucralose is a safe, well-tested food additive. There are no unresolved scientific concerns about its use.

Other Low-Calorie Sugar Substitutes

The five low-calorie sugar substitutes described in detail above are the only ones currently approved in the United States. Several other compounds are in use in other countries, however.

One of these is *alitame*. Like aspartame and neotame, alitame is a sugar substitute made from amino acids. Like neotame, it is a very powerful sweetening agent; alitame is 2,000 times sweeter than sugar. Alitame has been approved in Mexico, Colombia, China, Australia, and New Zealand. In the United States, a petition for the approval of alitame as a food additive has been submitted to the FDA. As of March 2006, this petition was being "held in abeyance," according to the FDA Web site. "Held in abeyance" indicates that FDA needs additional data in order to evaluate a substance and has deferred its evaluation until the data are submitted. Thus, there appears to be some scientific issue delaying the approval of this sugar substitute in the United States.

Cyclamate is in use in about 50 countries. Cyclamate is not a new product; it was discovered in 1937 and was used as a sugar substitute in the U.S. in the 1950s and 1960s, primarily in a very successful blend with saccharin. In 1970, however, cyclamate was banned in the U.S. in response to an animal experiment that seemed to indicate that it could cause bladder cancer. Later, extensive further studies in several animal species did not show any link between cyclamate and cancer. Thus, on the basis of the complete body of evidence, scientists have concluded that cyclamate is not a cancer-causing agent. The manufacturer of cyclamate has submitted a petition for its reapproval in the United States. This petition, like the one for alitame, is currently being "held in abeyance" (as of March 2006) while additional scientific data are developed.

Indigenous peoples of South America have used the leaves of the *stevia* plant, a shrub that grows wild in Brazil and Paraguay, as a sweetener for centuries. Stevia leaves contain at least ten sweet components, the most important of which are stevioside and rebaudioside A. An extract of stevia containing these components has been used as a food ingredient in Japan for more than 30 years and more recently in other countries including China, Russia, and Korea. Stevia is not approved as a food ingredient in the United States. However, it is sold as a "dietary supplement." According to the provisions of the Dietary Supplement Health and Education Act (DSHEA), which was passed in 1994, dietary supplements do not need FDA approval before they are marketed, in the way that new food additives or drugs do. Dietary supplements that contain stevia cannot legally be promoted as sugar substitutes in the U.S., and stevia cannot be used as an ingredient in foods. The sale of the supplements is legal, however.

Some proponents of stevia contend that its safety has been adequately demonstrated by its history of apparently safe use in other parts of the world. In addition, they argue that a natural product such as stevia need not be subjected to the same type of scientific evaluation required for synthetic food additives. However, the mere fact that a substance is "natural" does not mean that it is necessarily safe. Many natural plant components are toxic. And while a long history of use does indicate that a substance is free from severe, immediate toxic effects, it does not guarantee that the substance is entirely safe. Rare adverse effects, delayed effects, or effects that occur only with long-term use may not be identified without systematic scientific testing. There are, in fact, some safety concerns about stevia. Animal experiments have raised the possibility that stevia extract may have harmful effects on the male reproductive system; it is uncertain what components of the extract are responsible. Whether the results of these experiments are applicable to humans is unclear.

It is often claimed that the FDA is unfairly persecuting stevia by not allowing the product to be sold as a food additive. This claim reflects a misunderstanding of how the food additive approval system works. FDA does not, on its own initiative, make decisions to permit new ingredients in the food supply. It only acts in response to petitions submitted to it. For stevia to be approved as a food additive, someone would have to submit a petition to FDA that provides adequate evidence of its safety.⁴ This has not happened.

General Issues Pertaining to Low-Calorie Sugar Substitutes

Choice of Sugar Substitutes. Food manufacturers choose among the available sugar substitutes based on taste considerations, stability, and cost. In some instances, blends of sugar substitutes are used. The use of blends has a long history; a cyclamate/saccharin blend was widely used in diet soft drinks in the 1960s, aspartame/saccharin blends are commonly used in fountain soft drinks in the U.S. today, and aspartame/acesulfame-K blends are currently used in many foods and beverages. Blends may have taste or cost advantages over individual sugar substitutes. There are no health-related reasons for choosing one sugar substitute over the others; all are safe, well-tested products.

Acceptable Levels of Consumption. Estimated intakes of all the low-calorie sugar substitutes currently approved in the U.S. are well within the ranges that are considered acceptable. Therefore, people do not need to limit their intake of products made with these ingredients for reasons pertaining to the sugar substitutes themselves. However, since many of the products that contain sugar substitutes are foods of minimal nutritional value (e.g., carbonated beverages), people who are trying to eat healthfully may find it necessary to limit consumption of these foods to avoid displacement of more nutritious foods from the diet. This issue is especially important for children and adolescents, among whom displacement of milk by other beverages is a concern.

The use of low-calorie sugar substitutes could improve dietary quality if consumers use calorie savings for the consumption of more nutritious foods. For

4. For some food ingredients, an alternative route to approval called GRAS notification is possible. In this instance, the sponsor of the food ingredient notifies FDA that it believes a substance to be generally recognized as safe (GRAS) and provides both technical evidence of its safety and evidence that a consensus exists among qualified experts as to the safety of the substance under the conditions of its intended use. FDA then reviews the notification and decides whether or not to object to it. In this procedure, as with the food additive approval procedure described above, the manufacturer of the proposed food ingredient must take the initiative. In both instances, FDA merely reviews evidence submitted to it; the agency does not choose which substances to evaluate.

example, if a person drinks a zero-calorie diet soft drink rather than a 150-calorie regular soft drink, this provides the opportunity to include 150 calories from a more nutritious food in the diet. Some people may indeed be using reduced-calorie foods and beverages this way. A recent analysis of data from two national diet surveys indicates that American adults who use reduced-sugar products have better diets and higher vitamin and mineral intakes than those who use the full-sugar versions of the same foods and beverages.

Effect on Weight Control. The effect of low-calorie sugar substitutes on weight control has been a subject of controversy. It has been claimed that the use of these products could hamper weight loss efforts by promoting increased food intake. However, the overall scientific evidence does not support this concern.

The idea that sugar substitutes might promote weight gain originated with a 1986 British study in which self-rated appetite was found to be higher in people who drank aspartame-sweetened water as compared to those who drank plain water. In several other studies, however, consumption of aspartame or other sugar substitutes did not lead to increases in self-rated appetite. In addition, several studies have assessed the effect of sugar substitute consumption on actual food intake, and none has shown an increase.

The use of sugar substitutes may be helpful for individuals who are trying to control their weight by providing palatable low-calorie food choices. A study from Harvard Medical School supports this idea. The study involved overweight women who participated in a four-month multidisciplinary weight-reduction program. The women were divided into two groups; one group was encouraged to consume aspartame-sweetened products, while the other group was asked to avoid them. The two groups of women lost similar amounts of weight during the program. However, during the three years after the program ended, the women in the aspartame group were more successful than those in the other group in maintaining their weight loss.

Other Types of Sugar Substitutes

The sugar substitutes discussed earlier in this booklet substitute only for the sweetness of sugar, not its physical bulk. When bulk is important, for example in chewing gums, candies, ice cream, baked goods, and fruit spreads, other types of sugar substitutes, such as sugar alcohols (polyols), may be used. Polyols usually replace sugar on a one-to-one basis (that is, one ounce of polyol substitutes for one ounce of sugar). Since some polyols are not as sweet as sugar, a low-calorie sugar substitute may also be included in the product to pro-

vide additional sweetness. Polyols used in foods in the U.S. include *sorbitol*, *mannitol*, *xylitol*, *isomalt*, *erythritol*, *lactitol*, *maltitol*, *hydrogenated starch hydrolysates*, and *hydrogenated glucose syrups*.

Polyols and other bulk sugar substitutes have three potential advantages over sugar as food ingredients:

- Unlike sugars, they do not promote tooth decay. The bacteria in dental plaque, which produce substantial amounts of decay-promoting acid from sugars and starches, produce little or no acid from polyols. In the United States, FDA allows a health claim on foods made with polyols stating that the food does not promote tooth decay, provided that the food also meets other requirements (such as not containing decay-promoting sugars). Label claims of this type are often found on sugarless chewing gums made with polyols.
- Polyols produce a lower glycemic response (i.e., a lower rise in blood sugar levels after consumption) than most sugars and starches do. Thus, their use may have advantages for people with diabetes.
- Polyols are lower in calories than sugar is — usually by about half — because they are incompletely digested.

Incomplete digestion, however, is a mixed blessing. Although it helps with calorie reduction, it can also lead to gastrointestinal effects such as looser stools and gas production (flatulence). These effects are similar to those associated with foods that contain carbohydrates of low digestibility, such as bran cereals. Gastrointestinal effects of polyols increase with the amount consumed, and some people are more sensitive than others to these effects. In the United States, some products containing substantial amounts of polyols are required to carry a label notice stating that “excess consumption may have a laxative effect.”

Two new sugar substitutes that are functionally similar to polyols, *trehalose* and *tagatose*, have recently come onto the market. These substances are actually sugars, but their properties are more similar to those of sugar alcohols than those of table sugar. Tagatose is used in foods much as the polyols are. Although it is a sugar, it does not promote tooth decay, and products sweetened with it are permitted to carry a “does not cause tooth decay” label claim. Trehalose is used in foods primarily because it helps to stabilize them during freezing or dehydration, rather than as a sweetening agent. Both trehalose and tagatose have been evaluated for safety and accepted as “generally recognized as safe” (GRAS).

Conclusions

Extensive scientific research supports the safety of the five low-calorie sugar substitutes currently approved for use in foods in the U.S. (acesulfame-K, aspartame, neotame, saccharin, and sucralose). The polyols and similar substances used as bulk sugar substitutes in the U.S. are also safe, but consumers need to be aware of their presence in food products so that they can limit their intake sufficiently to avoid gastrointestinal discomfort. The availability of a variety of safe sugar substitutes is of benefit to consumers because it enables food manufacturers to formulate a variety of good-tasting sweet foods and beverages that are safe for the teeth and lower in calorie content than sugar-sweetened foods.

The proliferation of myths and misinformation on the Internet about the safety of sugar substitutes should serve as a reminder that all sources of health-related information are not created equal. Distinguishing between reliable and unreliable information sources on the World Wide Web can be challenging. Simply entering a topic into an Internet search engine is not the best way to obtain science-based advice.

A better approach is to visit trustworthy health-related Web sites, such as the National Library of Medicine site (<http://www.nlm.nih.gov/medlineplus/>), the U.S. government's health clearinghouse site (<http://www.healthfinder.gov/>), the sites of government agencies such as the Food and Drug Administration (www.fda.gov) or the U.S. Department of Agriculture (www.usda.gov), or the sites of trusted professional organizations or voluntary groups such as the American Dietetic Association (www.eatright.org), the American Heart Association (www.americanheart.org), or the American Cancer Society (www.cancer.org), and then search within the collections of documents at these sites for information on a specific topic.

In instances where something sounds too good — or too horrible — to be true, it's also a good idea to see whether the topic in question is discussed on the Urban Legends Reference Pages (www.snopes.com) and/or Quackwatch (www.quackwatch.com). Both sites are reliable, and they are frequently updated with new information about various health myths and misinformation.

Sources for Further Reading

A good basic source of information on all types of sugar substitutes is an article by John Henkel called "Sugar Substitutes: Americans Opt for Sweetness and Lite," published in the Food and Drug Administration's magazine *FDA Consumer* in 1999 and updated in some respects in 2006 (its discussion of neotame is still outdated, however). It is available on the FDA Web site at www.cfsan.fda.gov/~dms/fdsugar.html

The American Dietetic Association publishes and regularly updates a position paper on the use of nutritive and nonnutritive sweeteners. The current version, updated in 2004, is available online at www.eatright.org/cps/rde/xchg/ada/hs.xsl/advocacy_adap0598_ENU_HTML.htm

The Association also has an informative fact sheet about aspartame, which you can find at www.eatright.org/cps/rde/xchg/SID-5303FFEA-32E724A8/ada/hs.xsl/nutrition_1030_ENU_HTML.htm

The International Food Information Council has a brief but informative summary of information on sugars and sugar substitutes on its Web site at ific.org/nutrition/sugars/index.cfm

The National Cancer Institute has a fact sheet about sugar substitutes and cancer, with a link to additional information on the cancer testing of saccharin, on its Web site at www.cancer.gov/cancertopics/factsheet/Risk/artificial-sweeteners.

Readers who are interested in finding out about the research necessary before a new food additive can be approved may wish to browse supplement 2 of volume 38 of the journal *Food and Chemical Toxicology*, published in 2000. This 129-page report, devoted entirely to the safety testing of sucralose, can be found in many university libraries.

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ATTACHMENT B

Current Research

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

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ABSTRACT

Objective Little research has been conducted on health effects associated with consumption of flavored milk. The purposes of this study were to compare nutrient intakes and body measures among children and adolescents drinking flavored milk (with or without plain milk), exclusively plain milk, and no milk.

Design Data used in the study included intakes reported in 24-hour dietary recalls and height and weight measurements collected during a physical examination in the 1999-2002 National Health and Nutrition Examination Surveys. The milk drinking status of each person was identified, and nutrient intakes and body mass index (BMI) measures were determined by milk drinking status.

Subjects The study population included 7,557 children and adolescents aged 2 to 18 years.

Statistical analysis Comparisons among mean milk intakes, energy and nutrient intakes, and BMI measures by milk drinking status were completed using linear regression analysis.

Results Children and adolescents who included flavored milk in their diets reported higher total milk intakes than consumers of exclusively plain milk ($P < 0.05$). Intakes of vitamin A, calcium, phosphorus, magnesium, potassium, and saturated fat (adjusted for energy intake and age) were generally comparable among milk drinking groups, whereas intakes by milk nondrinkers were significantly lower ($P < 0.05$). Among females aged 12 to 18 years, cal-

cium intakes by flavored and exclusively plain milk drinkers were 992 ± 41.5 and $1,038 \pm 22.5$ mg/day, respectively, whereas intake by nondrinkers was 576 ± 11.7 mg/day. Intake of added sugars did not differ between flavored milk drinkers and milk nondrinkers. BMI measures of milk drinkers were comparable to or lower than measures of nondrinkers ($P < 0.05$).

Conclusions Findings from this study suggest that consumption of either flavored or plain milk is associated with a positive influence on nutrient intakes by children and adolescents and is not associated with adverse effects on BMI measures.

J Am Diet Assoc. 2008;108:631-639.

Milk is a key source of macronutrients, calcium, magnesium, phosphorus, vitamin D, vitamin A, riboflavin, vitamin B-12, zinc, and potassium for US children and teenagers (1-6), and milk drinkers are more likely to meet dietary recommendations for many nutrients (7-9). Other beverages contribute to energy intakes but provide fewer nutrients. Fruit juices are top contributors to intakes of vitamin C and folate (1,6). Sugar-sweetened beverages such as soft drinks and fruit drinks provide significant proportions of daily energy and added sugars intakes, and fruit drinks make small contributions to vitamin C intakes (1,6).

Several of the nutrients provided by milk are important for optimal health and growth (10-13). The Dietary Guidelines for Americans recommend that children aged 2 to 8 years consume 2 c/day fat-free or low-fat milk or equivalent dairy servings, and that all people aged 9 years and older consume three dairy servings per day (14). However, only about one third to one half of American children and adolescent boys consume the recommended number of dairy servings, and fewer than one in five adolescent girls meets the recommendation (15). Approximately 60% to 80% of total dairy servings consumed by children and adolescents are consumed as milk, either as a beverage or as an ingredient in mixtures such as pudding or soup (15).

Flavored milks provide another option for meeting the recommended intakes of dairy products, and research in schools shows that students purchase more milk when milk offerings are enhanced and include flavored milk (16). Servings of plain milk and chocolate milk provide essentially identical amounts of protein, total and satu-

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Manuscript accepted: September 7, 2007.

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0002-8223/08/10804-0006\$34.00/0

doi: 10.1016/j.jada.2008.01.004

rated fat, calcium, phosphorus, magnesium, vitamin A, riboflavin, and potassium. Milk is a source of naturally occurring sugars, with each 8 fl oz serving of 1% (low-fat) plain milk providing approximately 13 g lactose per cup (17). A serving of low-fat plain milk provides approximately 100 kcal whereas a serving of low-fat chocolate milk delivers approximately 160 kcal; added sugars account for the difference in energy content (17). The added sugars content of flavored milks does vary, and products prepared with noncaloric sweeteners provide levels of energy and added sugars more similar to levels in plain milk. For example, chocolate milk made from nonfat milk with a combination of nutritive and non-nutritive sweeteners provides 120 kcal per 8 fl oz serving (18).

In most of the research on contributions of beverages to nutrient intakes, plain and flavored milks are typically grouped together in a single milk or dairy category. Little research has been conducted to examine nutrient intakes by consumers of flavored milk. Johnson and colleagues (19) found that consumption of flavored milk was significantly and positively associated with calcium and phosphorus intakes, but found no relationship between flavored milk intake and consumption of added sugars. In another study (20), consumption of sweetened dairy products (a category including flavored milks, flavored yogurts, ice creams, and puddings) was associated with higher intakes of dairy servings and calcium by children and adolescents, and higher intakes of added sugars by children, though sweetened dairy product intake was not associated with added sugars intakes by adolescents.

Some schools limit children's access to flavored milk presumably due to concerns that the beverages provide unhealthful levels of added sugars and fat, therefore potentially contributing to the childhood obesity epidemic (21). Childhood obesity is a significant concern in the United States; data collected between 2003 and 2004 indicate that 17.1% of children and adolescents aged 2 through 19 years were overweight (22).

We are unaware of evidence that consumption of flavored milk is associated with increased risk for obesity. Results from cross-sectional, longitudinal, and intervention studies suggest that increased milk or dairy product consumption, which may include flavored milk, has no effect on body measures in children or adolescents (23-27), or is inversely related to body measures (28-30).

The purpose of this study was to compare nutrient intakes of children and adolescents drinking flavored milk (flavored milk only or both flavored and plain milk), those drinking exclusively plain milk, and those drinking little or no milk. Additionally, body mass index (BMI) and BMI *z* scores were compared by milk drinking status.

METHODS

Sample Population

The study population consisted of children and adolescents included in the 1999-2000 and 2001-2002 National Health and Nutrition Examination Surveys (NHANES) conducted by the National Center for Health Statistics, Division of Health Examination Statistics, in the Centers for Disease Control and Prevention of the US Department of Health and Human Services. The dietary recall component of the survey was jointly developed by the Depart-

ment of Health and Human Services and the US Department of Agriculture. The populations for these surveys were selected as multistage probability samples of the civilian noninstitutionalized US population, and the results provide nationally representative nutrition and health data and prevalence estimates for nutrition and health status measures (31,32). In these surveys, low-income persons, adolescents, adults ages 60 years and older, African Americans, and Mexican Americans were oversampled to provide more reliable estimates for these subpopulations.

A total of 8,503 children and adolescents aged 2 to 18 years were interviewed in NHANES 1999-2002, and 8,181 completed the examination component in which trained dietary interviewers collected detailed information on all foods and beverages consumed in the previous 24 hours (midnight to midnight). Proxy respondents were permitted for survey participants younger than age 6 years, and assisted interviews were completed with participants aged 6 to 11 years. Recalls were collected using computerized, multiple-pass methods. These methods guide the respondent through the dietary intake period more than once and consequently provide multiple opportunities to identify foods and specific details about the foods consumed during the recall period (33). The dietary recalls from 7,557 nonpregnant, nonlactating, nonfasting, and nonbreastfeeding children and adolescents were determined by the National Center for Health Statistics to be reliable and meet minimum criteria based on completeness of food descriptions provided and identification of amounts eaten (31,32).

To study nutrient intakes of children and adolescents based on milk drinking status, NHANES 1999-2002 respondents were grouped into five subpopulations: children aged 2 to 5 years, boys aged 6 to 11 years, girls aged 6 to 11 years, boys aged 12 to 18 years, and girls aged 12 to 18 years (Table 1).

Categorization of Respondents by Milk Drinking Status

The dietary records of each child and adolescent were reviewed and each participant was categorized as one of three types of cow's milk drinkers: a flavored milk drinker, an exclusively plain milk drinker, or a nondrinker. Flavored milk was defined as either ready-to-drink flavored fluid milk or flavored milk prepared from plain fluid milk and flavored syrups or powder. Plain milk included all fluid, plain milk, excluding evaporated milk and sweetened condensed milk. The plain milk portion of unflavored beverage mixtures or combinations (eg, milk in a latte or milk consumed with coffee or tea) was categorized as plain milk.

Milk-based meal replacements, milkshakes, eggnog, beverages made with milk ingredients, such as Yoo-Hoo (Cadbury Schweppes, Plano, TX), and cocoa beverages made from flavored powders and water were not counted as either flavored or plain milk in this analysis because these beverages contain milk ingredients but are not fluid milk. Reconstituted dry milk was not included as it was seldom consumed.

Based on these definitions of flavored and plain milk, the total amount of both flavored and plain milk consumed by each respondent on the day of recall was calculated by summing the contributions from each qualify-

Table 1. Mean total, flavored, and plain milk intake by milk drinking status of children and adolescents aged 2 to 18 years (N=7,557), based on data from the 1999-2002 National Health and Nutrition Examination Surveys

Population and milk drinking status ^b	n	% ^c	Mean Milk Intake (fl oz/d) ^a		
			Total	Flavored	Plain
← mean ± standard error →					
Children 2 to 5 y					
Flavored milk	305	20.0	19.5 ± 1.11 ^x	12.0 ± 0.64	7.5 ± 0.92 ^y
Exclusively plain milk	977	65.1	13.8 ± 0.60 ^y	0.0 ± 0.00	13.8 ± 0.60 ^x
Nondrinker	239	14.9	0.0 ± 0.02	0.0 ± 0.00	0.0 ± 0.02
Boys 6 to 11 y					
Flavored milk	270	21.3	19.8 ± 1.34 ^x	12.2 ± 1.25	7.5 ± 0.8 ^y
Exclusively plain milk	542	54.7	13.1 ± 0.71 ^y	0.0 ± 0.00	13.1 ± 0.71 ^x
Nondrinker	249	24.0	0.0 ± 0.01	0.0 ± 0.00	0.0 ± 0.01
Girls 6 to 11 y					
Flavored milk	235	21.7	13.7 ± 0.61 ^x	9.1 ± 0.48	4.6 ± 0.56 ^y
Exclusively plain milk	533	54.9	11.4 ± 0.50 ^y	0.0 ± 0.00	11.4 ± 0.50 ^x
Nondrinker	268	23.4	0.0 ± 0.00	0.0 ± 0.00	0.0 ± 0.00
Boys 12 to 18 y					
Flavored milk	259	14.9	21.9 ± 1.62 ^x	13.0 ± 1.04	9.0 ± 0.82 ^y
Exclusively plain milk	890	46.2	17.1 ± 0.79 ^y	0.0 ± 0.00	17.1 ± 0.7 ^x
Nondrinker	846	39.0	0.0 ± 0.01	0.0 ± 0.00	0.0 ± 0.01
Girls 12 to 18 y					
Flavored milk	196	9.4	15.8 ± 0.98 ^x	10.6 ± 0.85	5.2 ± 0.68 ^y
Exclusively plain milk	763	42.1	13.1 ± 0.58 ^y	0.0 ± 0.00	13.1 ± 0.58 ^x
Nondrinker	985	48.5	0.0 ± 0.00	0.0 ± 0.00	0.0 ± 0.00

^aMean values of 0.0 are <0.05 and standard error values of 0.00 are <0.005. Different superscripts (x,y) between milk groups (flavored milk vs exclusively plain milk) within each age-sex group in the total milk or plain milk column indicate a statistically significant difference between groups (P<0.05).
^bMilk drinking status based on consumption of milk as a beverage or in ready-to-eat breakfast cereal; flavored milk drinkers may have consumed plain milk in addition to flavored milk.
^cWeighted percent of the population.

ing reported intake. Each respondent was then categorized into a milk drinking status category. The group of flavored milk consumers includes all children and adolescents who reported consumption of flavored milk as a beverage or in a cereal; flavored milk drinkers may also have reported intake of plain milk. The exclusively plain milk group includes children and adolescents who reported intake of plain milk only. The category of nondrinkers therefore represents children and adolescents who reported consumption of less than ¼ c milk as a beverage or with ready-to-eat cereal.

The intent of this research was to determine if children and adolescents who include flavored milk in their diets (either exclusively or in combination with plain milk) have different nutrient intakes or BMI measures compared to children and adolescents drinking exclusively plain milk or no milk. Only individuals reporting a total daily intake of at least ¼ c milk were classified as milk drinkers. This volume of milk was used as a minimum criterion in the study as it provides meaningful contributions of many nutrients. For example, ¼ c low-fat chocolate milk provides approximately 72 mg calcium, 106 mg potassium, and 122 IU vitamin A (17). A ¼-c portion of flavored milk may also provide meaningful energy contributions with respect to BMI. One-quarter cup nonfat chocolate milk contains approximately 35 kcal (34), whereas low-fat, reduced-fat or whole chocolate milk provide approximately 40, 48, or 52 kcal per ¼ c, respectively (17). Boys and girls aged 3 to 8 and 9 to 18 years require

20 and 25 kcal per day, respectively, for growth (35). Thus, this amount of flavored milk provides sufficient energy to place a child or adolescent in positive energy balance, which over time could theoretically be positively associated with BMI.

Estimation of Nutrient Intakes

The US Department of Agriculture Multi-Year Food and Nutrient Database for Dietary Studies, 1.0 (36) was used as the primary data source to calculate intakes of energy and most nutrients for each survey respondent. Values for the remaining nutrients or constituents were obtained from complementary databases or imputed (15,37). Results from analysis of intakes of energy, macronutrients, cholesterol, added sugars, calcium, phosphorus, magnesium, potassium, and vitamin A are reported here. Milk is an important source of these vitamins and minerals, and for some or most children or adolescents, dietary intakes are inadequate (38). Vitamin D-fortified milk is also the key source of dietary vitamin D in the United States, and intakes may be suboptimal for some young people (2). This vitamin is not included in the nutrient database for NHANES 1999-2002, thus it was not included in this analysis.

Energy and nutrient intakes on the day of dietary recall were calculated for each respondent by multiplying the food code-specific energy and nutrient concentration

data by the corresponding weight (in grams) of each reported food and summing contributions from all foods.

BMI and BMI z Score Data

People participating in NHANES 1999-2002 were asked to undergo an extensive physical examination during which height and body weight were measured and recorded. BMI values were calculated as kg/m². Age- and sex-specific BMI z scores were calculated using data files available from the Centers for Disease Control and Prevention (39).

Statistical Analysis

Mean intakes of flavored milk, plain milk, total milk, energy, and nutrients were estimated for each milk-drinking status group. Milk volumes were calculated assuming 244 g and 250 g per 8 fl oz plain and flavored milk, respectively. Mean BMI and BMI z scores were estimated for each age, sex, and milk-drinking status group.

Nutrient intakes were adjusted for total energy intake and age using linear regression to control for independent associations between these variables and nutrient intakes; analyses for the group of boys and girls aged 2 to 5 years also were adjusted for sex. Adjustment for energy intake allows examination of differences between nutrient intakes based on group differences in the types of foods consumed, rather than on differences in the energy value of foods and beverages consumed. An adjustment for age was included to account for differences in consumption patterns that may be related to the range of ages within each group. The adjusted mean nutrient intakes for each milk-drinking status group therefore represent nutrient intakes predicted based on equal energy intakes and age distributions (and sex distribution in the case of the 2- to 5-year-olds) among all milk-drinking groups within an age-sex category.

All analyses were completed with NHANES sampling weights to adjust for differences in subpopulation representation; results therefore can be considered representative of the US population aged 2 to 18 years. Error terms and statistical comparisons were generated using STATA (version 9.2, 2007, StataCorp LP, College Station, TX) commands appropriate for the complex sample design of NHANES. If the *F* test for a regression analysis was significant ($P < 0.05$), pairwise comparisons were completed using the adjusted Wald test and a Bonferroni adjusted *P* value to identify significant differences among adjusted means in analyses of nutrient intakes or unadjusted means in analyses of BMIs and BMI z scores.

RESULTS

The analysis was based on dietary recalls collected from 7,557 children and adolescents. A total of 1,265 respondents were classified as flavored milk drinkers, 3,705 were classified as exclusively plain milk drinkers, and 2,587 were classified as nondrinkers of milk (Table 1). In each group, total milk intakes by flavored milk consumers were significantly greater than total milk intakes by consumers of exclusively plain milk, although intakes of plain milk by flavored milk drinkers were lower than intakes by exclusively plain milk drinkers. More than

95% of children and adolescents identified as flavored milk drinkers reported drinking ½ c or more of flavored milk on the day of recall, and 92% or more of children and adolescents identified as exclusively plain milk drinkers reported drinking at least ½ c plain milk (data not shown). In addition, 70% or more of the populations of flavored milk and exclusively plain milk drinkers consumed 1 c or more of flavored or plain milk, respectively (data not shown).

Energy

Mean energy intakes by milk consumers were significantly greater than energy intakes by milk nondrinkers for all groups except boys aged 6 to 11 years (Table 2). Among 2- to 5-year-olds, energy intakes by children who consumed flavored milk were greater than intakes by consumers of exclusively plain milk. Mean energy intakes were not different between consumers of flavored or exclusively plain milk in populations of 6- to 11-year-olds or 12- to 18-year-olds.

Nutrient Intakes, Unadjusted for Energy, Age, and Sex

Because there were significant differences in energy intakes among the three milk categories, the nutrient intake estimates presented (Tables 2 and 3) and discussed here are intake estimates adjusted for energy intake, age, and sex. The unadjusted means (data not shown) tended to show higher nutrient intakes by 2- to 5-year-old flavored milk drinkers compared with exclusively plain milk drinkers, possibly reflecting their higher energy intakes. Overall, differences among unadjusted mean nutrient intakes by milk drinking status of 6- to 11-year-olds and 12- to 18-year-olds were similar to differences based on the adjusted values. Notable differences between the unadjusted and adjusted mean nutrient intakes were seen only for total fat and added sugars. Unadjusted mean intakes of total fat by 2- to 5-year-olds in the flavored milk group were higher than intakes by exclusively plain milk drinkers and intakes by exclusively plain milk drinkers were higher than intakes by milk nondrinkers, again likely reflecting higher energy intakes by these groups. Unadjusted mean total fat intakes by older female (aged 6 to 11 and 12 to 18 years) consumers of flavored milk were comparable to intakes by exclusively plain milk drinkers, and higher than intakes by milk nondrinkers. Unadjusted mean added sugars intakes differed by milk drinking status only in the population of 2- to 5-year-olds; intakes were highest among flavored milk drinkers, lowest among exclusively plain milk drinkers, and intermediate among milk nondrinkers.

Nutrient Intakes, Adjusted for Energy Intakes, Age, and Sex

Macronutrients, Cholesterol, and Added Sugars. Drinkers of flavored milk and exclusively plain milk had comparable protein intakes on the day of recall, and these intakes were greater than those by milk nondrinkers for most groups (Table 2). Milk nondrinkers aged 2 to 5 years had higher fat intakes than milk drinkers, and nonmilk drinking males aged 12 to 18 years had higher fat intakes than exclusively plain milk drinkers. Except for girls aged 6 to 11 years, milk drinkers tended to have higher

Table 2. Mean unadjusted energy intakes and mean adjusted macronutrient and added sugars intakes by milk drinking status of children and adolescents aged 2 to 18 years (N=7,557), based on data from the 1999-2002 National Health and Nutrition Examination Surveys

Nutrient and population	Intake ^{abc}		
	Flavored milk drinkers	Exclusively plain milk drinkers	Nondrinkers
	← mean ± standard error →		
Energy (unadjusted) (kcal/d)			
Children 2 to 5 y	1,830 ± 35.6 ^x	1,630 ± 23.0 ^y	1,385 ± 54.4 ^z
Boys 6 to 11 y	2,200 ± 76.9	2,135 ± 67.1	2,068 ± 97.5
Girls 6 to 11 y	2,046 ± 86.4 ^x	1,864 ± 33.7 ^x	1,705 ± 51.6 ^y
Boys 12 to 18 y	2,825 ± 131.8 ^x	2,699 ± 51.0 ^x	2,449 ± 51.9 ^y
Girls 12 to 18 y	2,248 ± 92.4 ^x	2,077 ± 32.9 ^x	1,837 ± 47.1 ^y
Protein (g/d)			
Children 2 to 5 y	55.8 ± 1.14 ^x	56.0 ± 0.66 ^x	48.1 ± 0.85 ^y
Boys 6 to 11 y	73.0 ± 1.80 ^x	72.0 ± 1.25 ^{xy}	64.7 ± 2.55 ^y
Girls 6 to 11 y	62.7 ± 1.43 ^x	63.9 ± 0.79 ^x	55.9 ± 1.27 ^y
Boys 12 to 18 y	97.1 ± 2.18 ^x	92.6 ± 1.26 ^x	86.1 ± 1.95 ^y
Girls 12 to 18 y	67.4 ± 2.22 ^{xy}	68.5 ± 0.95 ^x	61.4 ± 1.15 ^y
Total fat (g/d)			
Children 2 to 5 y	57.1 ± 0.99 ^y	57.9 ± 0.52 ^y	61.4 ± 1.41 ^x
Boys 6 to 11 y	77.2 ± 1.42	77.9 ± 1.31	81.4 ± 1.66
Girls 6 to 11 y	68.0 ± 1.66	68.1 ± 0.80	70.6 ± 1.42
Boys 12 to 18 y	93.0 ± 1.59 ^{xy}	93.3 ± 1.11 ^y	96.6 ± 1.25 ^x
Girls 12 to 18 y	72. ± 2.37	70.2 ± 1.23	73.7 ± 1.16
Total saturated fat (g/d)			
Children 2 to 5 y	22.1 ± 0.56 ^x	21.3 ± 0.27 ^x	19.6 ± 0.55 ^y
Boys 6 to 11 y	28.8 ± 0.45 ^x	27.9 ± 0.49 ^{xy}	26.0 ± 0.86 ^y
Girls 6 to 11 y	24.7 ± 0.61	24.2 ± 0.52	22.8 ± 0.57
Boys 12 to 18 y	34.6 ± 0.90 ^x	33.5 ± 0.49 ^x	31.4 ± 0.51 ^y
Girls 12 to 18 y	25.7 ± 0.84 ^{xy}	25.3 ± 0.41 ^x	23.9 ± 0.36 ^y
Carbohydrate (g/d)			
Children 2 to 5 y	230 ± 2.6	228 ± 1.5	227 ± 3.2
Boys 6 to 11 y	294 ± 3.6	292 ± 3.2	290 ± 4.6
Girls 6 to 11 y	257 ± 4.9	255 ± 2.0	258 ± 4.1
Boys 12 to 18 y	352 ± 5.3	358 ± 3.1	349 ± 4.2
Girls 12 to 18 y	270 ± 4.9	273 ± 3.0	270 ± 2.8
Added sugars (tsp/d)			
Children 2 to 5 y	17.8 ± 0.67 ^x	15.8 ± 0.48 ^y	18.8 ± 0.82 ^x
Boys 6 to 11 y	24.7 ± 0.69 ^{xy}	24.3 ± 0.79 ^y	28.5 ± 1.66 ^x
Girls 6 to 11 y	22.7 ± 1.26	21.0 ± 0.71	24.1 ± 1.03
Boys 12 to 18 y	34.1 ± 1.57	33.1 ± 0.90	35.3 ± 1.39
Girls 12 to 18 y	24.3 ± 1.51 ^{xy}	23.5 ± 0.59 ^y	28.0 ± 0.73 ^x

^aMeans for energy were unadjusted; means for all other nutrients were adjusted on energy, age, and sex.

^bMilk drinking status based on consumption of milk as a beverage or in ready-to-eat breakfast cereal; flavored milk drinkers may have consumed plain milk in addition to flavored milk.

^cDifferent superscripts within a row (x,y) indicate statistically significant differences using a Bonferroni adjustment ($P < 0.05$).

saturated fat intakes than nonmilk drinkers. No differences in cholesterol intake were observed by milk-drinking status (data not shown). Mean intake of total dietary carbohydrates did not differ among the three milk categories in any population group. Added sugars intakes were comparable for consumers of flavored milk and nondrinkers of milk. Added sugars intakes by exclusively plain milk drinkers were significantly lower than those by consumers of flavored milk and by milk nondrinkers aged 2 to 5 years. The added sugars intakes by boys aged 6 to 11 years and female respondents aged 12 to 18 years were lower for consumers of exclusively plain milk than for milk nondrinkers, but did not differ between the two groups of milk drinkers.

Minerals and Vitamin A. Intakes of calcium, phosphorus, magnesium, potassium, and vitamin A by milk drinkers were significantly higher than intakes of these nutrients by milk nondrinkers in every age-sex group (Table 3). Calcium intakes by flavored milk consumers were also higher than intakes by consumers of exclusively plain milk among boys aged 6 to 11 years, and phosphorus intakes by flavored milk drinkers were higher than those by consumers of exclusively plain milk among children aged 2 to 5 years and male respondents aged 12 to 18 years. Potassium intakes by flavored milk drinkers were higher than those by consumers of exclusively plain milk among boys aged 6 to 11 years and aged 12 to 18 years.

Table 3. Mean adjusted mineral and vitamin intakes by milk drinking status of children and adolescents aged 2 to 18 years (N=7,557), based on data from the 1999-2002 National Health and Nutrition Examination Surveys

Nutrient and population	Intake ^{abc}		
	Flavored milk drinkers	Exclusively plain milk drinkers	Nondrinkers
	← mean ± standard error →		
Calcium (mg/d)			
Children 2 to 5 y	1,030 ± 43.3 ^x	925 ± 24.9 ^x	537 ± 24.6 ^y
Boys 6 to 11 y	1,224 ± 40.8 ^x	1,054 ± 26.9 ^y	622 ± 31.2 ^z
Girls 6 to 11 y	952 ± 29.5 ^x	928 ± 24.9 ^x	563 ± 20.2 ^y
Boys 12 to 18 y	1,372 ± 48.2 ^x	1,315 ± 34.2 ^x	760 ± 17.7 ^y
Girls 12 to 18 y	992 ± 41.5 ^x	1,038 ± 22.5 ^x	576 ± 11.7 ^y
Phosphorus (mg/d)			
Children 2 to 5 y	1,168 ± 29.4 ^x	1,084 ± 17.3 ^y	814 ± 17.5 ^z
Boys 6 to 11 y	1,426 ± 29.5 ^x	1,306 ± 31.1 ^x	1,034 ± 36.5 ^y
Girls 6 to 11 y	1,183 ± 20.8 ^x	1,168 ± 18.5 ^x	897 ± 16.6 ^y
Boys 12 to 18 y	1,762 ± 28.4 ^x	1,657 ± 24.2 ^y	1,309 ± 16.5 ^z
Girls 12 to 18 y	1,262 ± 38.7 ^x	1,259 ± 17.7 ^x	943 ± 11.4 ^y
Magnesium (mg/d)			
Children 2 to 5 y	206 ± 4.2 ^x	198 ± 2.6 ^x	167 ± 4.4 ^y
Boys 6 to 11 y	252 ± 7.7 ^x	234 ± 5.5 ^x	197 ± 6.0 ^y
Girls 6 to 11 y	206 ± 4.4 ^x	210 ± 3.5 ^x	185 ± 4.3 ^y
Boys 12 to 18 y	305 ± 7.2 ^x	292 ± 4.6 ^x	251 ± 4.2 ^y
Girls 12 to 18 y	235 ± 8.5 ^x	227 ± 4.4 ^x	189 ± 2.8 ^y
Potassium (mg/d)			
Children 2 to 5 y	2,216 ± 44.5 ^x	2,094 ± 24.4 ^x	1,664 ± 38.1 ^y
Boys 6 to 11 y	2,559 ± 61.4 ^x	2,326 ± 52.8 ^y	1,813 ± 75.9 ^z
Girls 6 to 11 y	2,186 ± 64.0 ^x	2,084 ± 49.3 ^x	1,792 ± 53.6 ^y
Boys 12 to 18 y	3,146 ± 65.6 ^x	2,884 ± 57.3 ^y	2,356 ± 64.8 ^z
Girls 12 to 18 y	2,384 ± 76.9 ^x	2,263 ± 33.5 ^x	1,831 ± 33.4 ^y
Vitamin A, RAE (μg/d)			
Children 2 to 5 y	566 ± 27.0 ^x	557 ± 14.2 ^x	378 ± 30.8 ^y
Boys 6 to 11 y	720 ± 41.8 ^x	706 ± 20.2 ^x	389 ± 31.1 ^y
Girls 6 to 11 y	582 ± 55.5 ^x	585 ± 19.4 ^x	420 ± 23.3 ^y
Boys 12 to 18 y	733 ± 37.8 ^x	807 ± 27.9 ^x	443 ± 26.0 ^y
Girls 12 to 18 y	641 ± 63.4 ^x	690 ± 15.9 ^x	355 ± 24.2 ^y

*Means were adjusted on energy, age, and sex.

^bMilk drinking status based on consumption of milk as a beverage or in ready-to-eat breakfast cereal; flavored milk drinkers may have consumed plain milk in addition to flavored milk.

^cDifferent superscripts within a row (x,y) indicate statistically significant differences using a Bonferroni adjustment ($P < 0.05$).

BMI and BMI z Scores. BMI and BMI z scores did not differ by milk drinking status among children aged 2 to 5 years or 6 to 11 years; however, male milk nondrinkers aged 12 to 18 years had greater BMIs and BMI z scores compared to milk drinkers, and adolescent female milk nondrinkers had greater BMIs and BMI z scores compared to consumers of exclusively plain milk (Table 4).

DISCUSSION

Results of this study indicate that children and adolescents consuming flavored milk or exclusively plain milk have comparable nutrient intakes adjusted for energy, age and sex, and that their nutrient intakes tend to be superior to those of milk nondrinkers. It is important to note that only those children and adolescents who consumed milk had average calcium intakes close to their dietary recommended intakes (40).

Adjusted intakes of potassium, calcium, and phosphorus were higher among flavored milk drinkers than among exclusively plain milk drinkers in some age-sex groups.

Johnson and colleagues (19) reported higher total milk intakes (adjusted for total energy intake, age, sex, and race) by flavored milk consumers vs nonconsumers. In that study, flavored milk consumers also were found to have lower intakes of soft drinks and fruit drinks than nonconsumers of flavored milk. Their findings indicate that children and adolescents who drink flavored milk may elect to drink milk (either flavored or plain) in place of other less nutritious sweetened beverages that are high in added sugars. Other research has shown that milk drinkers who also drink sodas consume less milk and milk drinks than milk drinkers who do not drink sodas (8), and that sodas and other sweetened drinks tend to displace milk in the diets of some children and adolescents as they mature (41). Sweetened beverages including soda and fruit drinks are a significant source of added sugars in the diets of children and adolescents, accounting for 50% or more of total added sugars intakes by adolescents; these beverages are the number-one source of energy in teen diets (6,42).

Table 4. Mean body mass index (BMI) and BMI z score by milk drinking status of children and adolescents aged 2 to 18 years (N=7,557), based on data from the 1999-2002 National Health and Nutrition Examination Surveys

Body measure and population	Milk Drinking Status ^a					
	Flavored Milk Drinkers		Exclusively Plain Milk Drinkers		Nondrinkers	
	n	Mean±SE ^b	n	Mean±SE	n	Mean±SE
BMI						
Children 2 to 5 y	271	16.4±0.21	888	16.2±0.08	221	16.0±0.15
Boys 6 to 11 y	263	18.4±0.24	537	18.0±0.23	249	19.0±0.40
Girls 6 to 11 y	232	18.6±0.54	525	18.1±0.22	264	18.7±0.47
Boys 12 to 18 y	254	21.8±0.37 ^y	884	22.3±0.23 ^y	836	23.7±0.26 ^x
Girls 12 to 18 y	194	22.7±0.55 ^{xy}	748	22.2±0.23 ^y	978	23.8±0.28 ^x
BMI z score						
Children 2 to 5 y	271	0.36±0.113	888	0.21±0.048	221	0.16±0.092
Boys 6 to 11 y	263	0.63±0.104	537	0.41±0.076	249	0.52±0.093
Girls 6 to 11 y	232	0.48±0.155	525	0.39±0.070	264	0.43±0.115
Boys 12 to 18 y	254	0.27±0.114 ^y	884	0.35±0.053 ^y	836	0.59±0.052 ^x
Girls 12 to 18 y	194	0.60±0.102 ^{xy}	748	0.35±0.055 ^y	978	0.57±0.050 ^x

^aMilk drinking status based on consumption of milk as a beverage or in ready-to-eat breakfast cereal; flavored milk drinkers may have consumed plain milk in addition to flavored milk. Different superscripts (x,y) within a row indicate statistically significant differences using a Bonferroni adjustment ($P<0.05$).

^bSE=standard error.

In this study, adjusted intakes of added sugars were comparable between flavored milk drinkers and nonmilk consumers, and were significantly higher than intakes by exclusively plain milk consumers only among young children. These findings suggest that inclusion of flavored milk in the diet does not lead to significantly higher added sugars intakes by school-aged children and adolescents.

Among 2- to 5-year-olds, unadjusted energy intakes of flavored milk drinkers were higher than energy intakes by both exclusively plain milk drinkers and nondrinkers of milk. Among older children and adolescents, energy intakes by flavored milk drinkers were not significantly different from energy intakes by exclusively plain milk drinkers. The Dietary Guidelines for Americans encourage consumption of fat-free or low-fat dairy products instead of whole or reduced-fat products by people older than age 2 years (14), and increased access to nonfat or low-fat flavored milks prepared with less added sugars than traditional flavored milks would add less energy to the diets of children who prefer flavored milk to plain milk. Results from a 2005 survey conducted by the School Nutrition Association, the Child Nutrition Foundation, and the National Dairy Council on the availability of flavored milk in schools indicate that low-fat flavored milks were most commonly offered, and a majority of schools were interested in offering flavored milks with reduced sugar levels (43). The data used in this analysis are from the period 1999-2002, and may not reflect the most recent trends in milk consumption patterns. In the study populations of school-aged children and adolescents, 45% to 55% of flavored milk drinkers did not specify the fat content of flavored milk, and approximately 20% to 30% of people in each group reported drinking whole milk-based flavored milk (data not shown, based on unweighted data). These findings suggest that school-aged children and adolescents may not be able to recall

the specific fat content of the milk they report consuming. More than 50% of flavored milk drinkers aged 2 to 5 years consumed a whole milk-based flavored milk; these pre-school-aged children likely consumed flavored milk at home or in daycare settings.

Data suggest that school-aged children's access to flavored milk in school may help to promote milk consumption. Results from a study in schools show that students purchase more milk when fluid milk offerings are enhanced and include the option of flavored milks (16). We are unaware of any research on the influence that access to flavored milk in childhood may have on preferences for other sweet foods or plain milk.

Findings from this analysis show that mean BMIs and BMI z scores do not significantly differ among children aged 2 to 5 years or 6 to 11 years by milk drinking status based on a single day of recall. In the populations of 12- to 18-year-old boys and girls, mean BMIs and BMI z scores among milk drinkers were comparable to or lower than mean measures among nondrinkers of milk. Findings from this study therefore suggest that milk drinkers—either of flavored milk or of exclusively plain milk—are not likely to have higher body BMIs or BMI z scores than children or adolescents who do not drink milk.

There is a growing body of literature on milk or dairy consumption—which typically includes flavored milk—and body measures, but investigations specifically on flavored milk consumption and body measures were not identified. In a cross-sectional study of beverage patterns and BMI based on nationwide food consumption data in the United States, BMI of girls was found to be negatively correlated with milk consumption; however, no correlation between milk consumption and BMI of boys was observed (44). In a study of Italian children aged 3 to 11 years, milk consumption was inversely associated with age- and sex-specific BMI z scores (29).

A number of longitudinal studies have failed to find associations between intakes of milk or dairy products and changes in body measures (26,27), or changes in energy-adjusted BMI gains (45). Results of some longitudinal studies have shown inverse relationships between dairy intakes and body measures. Moore and colleagues (28), for example, found that adjusted BMI and body fat measures of 90 children aged 10 to 13 years were inversely related to dairy consumption at ages 3 through 5 years, suggesting that low consumption of dairy products at a young age places children at greater risk for excessive body fat gains in later years.

Findings from this study suggest that diets that include flavored milk are not associated with adverse effects on body measures as indicated by mean BMI or BMI z score. However, the goal of this research was not to assess relationships between the amount of milk consumed and body measures, but rather to determine if there are relationships among BMI and diets that include flavored milk or exclusively plain milk or no milk beverages.

An important strength of this study is that identification of flavored milk consumers was based on all reported intakes of flavored milk beverages or flavored milk beverage combinations. Through review of all beverage combinations, intakes of flavored milk that otherwise would have been misclassified as plain milk were identified. In addition, the estimates were developed from a large sample that is representative of the US population of children and adolescents.

Some limitations of the current analysis should be considered when interpreting the data. First, the analysis was based on a single 24-hour dietary recall, and it is unknown how representative these patterns of consumption are of usual intakes. An additional limitation may be underreporting during the dietary recall (46). Underreporting may be more prevalent among heavier children than lean children (47), which may have implications for the analysis of BMI by milk drinking status. In addition, foods and beverages such as soft drinks that may be perceived as "bad" foods are more likely to be underreported while foods and beverages perceived as "good" foods such as milk are less likely to be underreported (48). Furthermore, associations between milk drinking status and body measures cannot be attributed solely to milk consumption.

It is important to note that the milk drinking classifications in this study are based only on reported intakes of milk in beverages or with ready-to-eat cereals. Contributions from milk consumed in food mixtures such as cream soups or puddings were not considered when making the classifications. Intake of cheese, yogurt, and other dairy products that, like milk, are concentrated sources of potassium, calcium, phosphorus, and other nutrients were not examined (1,3,49). It is also important to recognize that the category of flavored milk drinkers includes children and adolescents who may have consumed plain milk as well as flavored milk; therefore, total nutrient intakes reflect contributions from both types of milk. Energy and added sugars intakes by children consuming both flavored and plain milk are potentially lower than intakes by children consuming comparable total amounts of flavored milk. In another study of flavored milk intakes by

children and adolescents no difference in added sugars intakes adjusted for energy, age, sex, and race was seen between people who consumed an average of 1 c or less of flavored milk per day vs those who consumed an average of more than 1 c (19).

Adjusted nutrient intakes were similar between flavored milk drinkers and drinkers of exclusively plain milk. These findings suggest that consumption of either flavored or plain milk has a positive influence on nutrient intakes by children and adolescents, and is not associated with adverse effects on BMI or BMI z score. Many children and adolescents fall short of the recommended daily intake of two servings of milk or equivalent dairy products for children aged 2 to 8 years, and three dairy servings per day for people aged 9 years and older (14,15). Access to low-fat or nonfat flavored milk could help children and adolescents meet the recommended intakes of dairy servings. Research is needed to determine the specific effects of flavored milk consumption on preferences for sweetened products, obesity, calcium intakes, and bone health. Until those data are available, limiting children and adolescents' access to flavored milk due to its higher added sugars or energy content may only have the undesirable effect of further reducing intakes of many essential nutrients provided by milk.

Funding for this research was provided by the National Dairy Council.

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ATTACHMENT C



APPLICATIONS

- A listserv offers a practical and innovative way to teach, learn, and communicate for dietetic interns who are participating in supervised practice rotations at remote sites. A listserv may provide the same advantages regardless of location.
- Future research should compare responses between interns in the Coordinated Program and the Dietetic Internship Program, evaluate student-led discussions in a classroom setting vs those on the listserv, and compare intern reactions to increased faculty time on the listserv vs increased faculty time visiting sites.

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The nutritional consequences of flavored-milk consumption by school-aged children and adolescents in the United States

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Children in the United States are drinking less milk because they are drinking more of other beverages such as soft drinks and fruit drinks (1-3). This decline in milk consumption may have serious, long-term, detrimental effects on the bone health of today's youth

(4,5). Milk and dairy products provide the most important source of calcium in children's diets and account for 75% of the calcium in the US food supply (6). According to the US Department of Agriculture (USDA), 90% of teenage girls and 70% of teenage boys do not meet

current calcium recommendations of 1,300 mg per day (7). The changes in children's milk consumption patterns have been attributed to a number of phenomena. Massive marketing of soft drinks as "fun" food (8) and increased competition for milk in schools from beverages that can generate greater profit (9) have undoubtedly contributed to the changes.

Flavored milk has the potential to increase children's milk consumption in school and at home. In a large school district in Georgia, a 15% gain in milk consumption resulted from the introduction of nonfat strawberry and vanilla milk (personal communication, G. Schulz, MEd, RD, Gwinett County School Nutrition Program, June 2, 2000). Some school nutrition personnel and parents are reluctant to offer children flavored milk, however, based on the perception that it will have a negative impact on the overall quality of children's diets. Specifically, concern is expressed that flavored milk increases added sugar consumption and could lead to lower total milk consumption resulting from children developing a taste preference or dependence for the flavored milk. Previous research conducted among Pennsylvania elementary school children demonstrated that including chocolate milk in school meals was well justified from the standpoint of nutrient intake (10). This research is now more than 20 years old, however, and was conducted using a relatively small sample of children in a limited geographic area. There is a need for contemporary research using a large, nationally representative sample of children in the United States to determine the nutritional consequences of flavored-milk consumption.

METHODS

Research Sample

The research sample was selected from all children aged 5 to 17 years participating in the 1994-96 and 1998 USDA Continuing Survey of Food Intakes of Individuals (CSFII) and for whom 2 complete days of dietary intake data were available (11). The surveys used a multistage, area probability sample designed to reflect the racial, geographic, and sociodemographic diversity of the US population. Sample weights developed by the USDA to compensate for variable probabilities of selection, differential nonresponse rates, and sampling frame considerations were used. This allowed for the generalization of the

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Table 1

Mean total milk^a, soft drink^b, fruit drink^c, and fruit juice^d consumption in grams by level of flavored-milk^e consumption by school-aged children (aged 5 to 11 years, n=2,763) and adolescents (aged 12 to 17 years, n=1,125), adjusted for total energy intake, age, sex, and race

	Flavored-milk consumption of children aged 5 to 11 years			Flavored-milk consumption of adolescents aged 12 to 17 years		
	Nonconsumer (n=2,001)	>0 and ≤240 g (n=562)	>240 g (n=200)	Nonconsumer (n=883)	>0 and ≤240 g (n=155)	>240 g (n=87)
Total milk (g)	325 ^a	404 ^a	517 ^a	262 ^a	382 ^a	539 ^a
Soft drink (g)	174 ^a	139 ^a	147 ^a	470 ^a	346 ^a	343 ^a
Fruit drink (g)	154 ^a	116 ^a	102 ^a	165 ^a	154 ^a	107 ^a
Fruit juice (g)	49 ^a	37 ^a	47 ^a	33 ^a	24 ^a	40 ^a

^aTotal milk includes all beverages with fluid cows' milk as the primary ingredient. Items such as evaporated milk and dry, reconstituted milk were included. Items such as canned meal replacements and infant formulas were excluded, as well as nonbeverage forms of milk such as yogurt, pudding, and ice cream.

^bSoft drink includes all regular-calorie carbonated beverages, such as cola, fruit-flavored soft drink, and cream sodas.

^cFruit drink includes punch, ade, and drinks that include <10% fruit juice.

^dJuice includes fruit juice, nectar, citrus fruit, and mixture of citrus juice with noncitrus juice.

^eFlavored milk includes milk with powder or syrup flavoring, milkshake, malted milk, milk drink, eggnog, and *Carnation instant breakfast* (not specific to flavor or milk type) (Nestlé, North Brunswick, NJ).

^{a,b,c,d,e}Means in a row with different superscripts are significantly different (P<.05).

Table 2

Mean nutrient intakes by level of flavored-milk consumption for school-aged children (aged 5 to 11 years, n=2,763) and adolescents (aged 12 to 17 years, n=1,125), adjusted for total energy intake, age, sex, and race

	Flavored-milk consumption by school-aged children			Flavored-milk consumption by adolescents		
	Nonconsumer (n=2,001)	>0 and ≤240 g (n=562)	>240 g (n=200)	Nonconsumer (n=883)	>0 and ≤240 g (n=155)	>240 g (n=87)
Vitamin A (RE ^a)	910.9 ^a	886.7 ^a	871.3 ^a	898.4 ^a	892.5 ^a	735.4 ^a
Vitamin C (mg)	99.3 ^a	85.7 ^a	89.1 ^a	103.0 ^a	104.2 ^a	93.2 ^a
Folate (mg)	270.0 ^a	264.0 ^a	239.2 ^a	260.6 ^a	275.9 ^a	261.4 ^a
Calcium (mg)	877.1 ^a	932.0 ^a	997.1 ^a	924.7 ^a	1,000.1 ^a	1,067.1 ^a
Phosphorus (mg)	1,157.2 ^a	1,190.2 ^a	1,244.6 ^a	1,331.5 ^a	1,380.0 ^a	1,446.9 ^a
Cholesterol (mg)	204.8 ^a	213.6 ^a	206.3 ^a	262.0 ^a	238.6 ^a	212.6 ^a
Fiber (g)	12.6 ^a	12.5 ^a	13.1 ^a	14.2 ^a	14.9 ^a	17.4 ^a
Added sugars (g)	84.8 ^a	86.2 ^a	90.2 ^a	117.6 ^a	115.1 ^a	109.9 ^a
% kcal total fat	32.3 ^a	33.1 ^a	32.1 ^a	32.7 ^a	33.3 ^a	31.7 ^a
% kcal saturated fat	11.8 ^a	12.2 ^a	12.2 ^a	11.5 ^a	11.8 ^a	11.6 ^a

^aRE=retinol equivalents.

^{a,b,c,d,e}Means in a row with different superscripts are significantly different (P<.05).

study results to all children in the United States aged 5 to 17 years.

The dietary intake data were collected as 2 in-person, 24-hour multiple-pass recalls. This dietary intake method has been demonstrated to provide valid measures of dietary intake for groups of children (12). For purposes of analysis, the sample was divided into 2 groups: schoolchildren 5 to 11 years of age and adolescents aged 12 to 17 years.

Study Variables

The independent variable was 2-day mean flavored-milk intake. All food codes in the CSFII database where the primary ingredient was flavored fluid cows' milk in beverage form were included. Nonbeverage forms of flavored milk (eg, strawberry yogurt, vanilla pudding, and chocolate ice cream) were excluded. The total intake in grams per sample child was calculated, and from this a 2-day mean intake was determined. For each age group, 3 categories of flavored-milk intakes were established: nonconsumers, >0 and ≤240 g, and >240 g.

The dependent variables in the study were 2-day mean intakes of total milk, soft drinks, sugar-sweetened fruit drinks and ades (<10% fruit juice), and fruit juices. Table 1 provides definitions of the beverage categories. Intakes of vitamins A and C, folate, iron, calcium, and phosphorus were examined. Cholesterol, fiber, and added sugars intakes, as well as percent energy from total and saturated fat, were examined.

Statistical Analysis

The Statistical Export and Tabulation System (SETS) software was used to convert the CSFII data contained in a CD-ROM to a usable format. The Statistical Analysis System was used to recode and format the data for statistical analysis. The Survey Data Analysis System (SUDAAN, release 6.40, 1995, Research Triangle Institute, Research Triangle Park, NC) was used to weight the sample, compute variances, and perform the statistical procedures. Analysis of covariance was used to determine the net effect of flavored-milk consumption on the dependant variables. Child age, sex, race, and total energy intake were entered as control variables to account for variations in the dependent variables that might otherwise be attributable to the control variables. Statistical significance for all analyses was set at P<.05.

RESULTS AND DISCUSSION

Description of the Sample

The total sample size was 3,888 ($n=2,763$ school-aged children and $n=1,125$ adolescents), and it was distributed approximately evenly between boys and girls (51.6% boys). By design, the sample was representative of the US population of children and adolescents aged 5 to 17 years.

Total Intakes of Milk, Soft Drink, Fruit Drink, and Fruit Juice

On average, the school-aged children consumed 358 g total milk per day, and the adolescents consumed 301 g per day. These averages included 174 school-aged children and 269 adolescents who did not consume any milk (total milk intake=0) over the 2-day survey period. In contrast, on average, the school-aged children consumed 53 g flavored milk per day, and the adolescents consumed 47 g per day. These averages included 935 school-aged children and 508 adolescents who did not consume any flavored milk (flavored-milk intake=0), which skewed the mean toward zero.

Flavored-milk intake was significantly ($P<.05$) and positively associated with total milk intake in both age groups (Table 1). On average, those children who consumed more than 1 cup of flavored milk per day had a total milk intake that was 192 g higher for children 5 to 11 years of age and 277 g higher for adolescents 12 to 17 years of age than the children in the respective age groups who were nonconsumers of flavored milk. Among the school-aged children and adolescents, flavored-milk intake was not associated with fruit juice intake and was significantly ($P<.05$) and negatively associated with soft drink and fruit drink consumption (Table 1).

Nutrient Intakes

Flavored-milk intake was positively associated with energy-adjusted calcium, phosphorus, and percent energy from saturated fat intakes and negatively associated with energy-adjusted vitamin C and folate intakes in the children aged 5 to 11 years (Table 2). Flavored-milk intake was positively associated with energy-adjusted calcium, phosphorus, and fiber intakes and negatively associated with energy-adjusted vitamin A intakes in the adolescents aged 12 to 17 years. There was no association between flavored milk intake and percent kilocalories from saturated fat among adoles-

cents. There was no association between flavored-milk consumption and percent energy from total fat and energy-adjusted added sugars intakes in either age group (Table 2).

This study was the first to our knowledge that examined the nutritional consequences of flavored milk in a representative sample of school-aged children and adolescents in the United States. The major findings were:

- Children who consumed flavored milk had higher total milk intake and lower soft drink and fruit drink intake but similar fruit juice intake compared with children who were nonconsumers of flavored milk; and

Flavored milks offer a well-accepted, nutritious alternative in the wide array of beverages available to children in the United States

- Children who consumed flavored milk had higher calcium intakes but similar percent energy from total fat and added sugars intake compared with children who were nonconsumers of flavored milk.

The observations that flavored milk did not increase added sugars intake was in all likelihood the result of lower intakes of soft drinks and fruit drinks by the children who consumed flavored milk. Guthrie and Morton (2) found that soft drinks were the major source of added sweeteners in the diets of children in the United States. Fruit-ades and drinks also accounted for a substantial portion of the total added sugars in children's diets. Together these beverages accounted for 34% of total added sugars intake for children aged 6 to 11 years, 48% of adolescent girls' intake, and 53% of adolescent boys' intake (2). Hence, it is not surprising when consumption of flavored milks reduces the intake of these nutrient-poor, sugar-sweetened beverages, there is no overall impact on total added sugars intake.

There are a number of studies demonstrating the important role that beverage choices play in the adequacy of children's diets. We previously demonstrated that only those children who include milk at the noontime meal achieve their recommended calcium intake (3). Harnack and colleagues (1) studied the nutritional consequences of soft drinks consumption and found that children and adolescents who were high consumers of soft drinks had lower intakes of riboflavin, folate, vitamins A and C, calcium, and phosphorus. Lastly, researchers who examined changes in children's eating patterns and food choices in a longitudinal, cohort study of Minnesota children found that as children moved from elementary school to junior high, the proportion of beverage coming from soft drinks more than tripled with concomitant reductions in milk and fruit juice consumption (13).

Tests of school vending machines conducted in 2001 demonstrate that low-fat and nonfat, flavored milks are a popular and feasible alternative to soft drinks and fruit drinks (7). Initial trials where milk vending machines were installed in middle and high schools have shown promising results with machines selling out on a daily basis (14). Chocolate was the preferred flavor, and although unflavored milk was available, it was typically the least popular.

APPLICATIONS

Flavored milks can play a role in changing recent trends in children's sugar-sweetened beverage consumption patterns that have a negative impact on their diet quality. Flavored milks offer a well-accepted, nutritious alternative in the wide array of beverages available to children in the United States.

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This research was funded by the National Dairy Council.

ATTACHMENT D

Lunch eating behavior of preschool children: Effects of age, gender, and type of beverage served

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Received 6 October 1998; received in revised form 21 December 1999; accepted 26 January 2000

Abstract

To examine the eating behavior of preschool children offered chocolate-flavored or plain milk at lunch, food consumption by 135 children, aged 18–66 months, was measured. Four different menus were served six times during a 12-week period, each menu being presented twice with each of three test beverages, plain milk (18.1 kcal/oz), sucrose-sweetened chocolate milk (29.4 kcal/oz), or aspartame-sweetened chocolate milk (18.6 kcal/oz). The type of milk beverage served had no significant effect on the consumption of other food items offered at that meal. Subjects did drink significantly more chocolate milk than plain milk during all meals and consequently consumed significantly more energy during those meals in which sucrose-sweetened chocolate milk was served. A macronutrient analysis of lunchtime food intake for each menu revealed significant differences in protein, fat, and carbohydrate content among the four menus. Older children consumed significantly more milk and more energy per lunchtime meal than did younger preschoolers, but no other consistent age-related differences were observed. No significant gender differences were detected in any of the statistical analyses conducted. These findings suggest that young children do not reduce the intake of other food items at a meal to compensate for the increased energy intake that results from excessive sucrose-sweetened milk consumption. Aspartame-sweetened milk increases milk intake in small children without providing them with the additional calories of sucrose-sweetened milk. © 2000 Elsevier Science Inc. All rights reserved.

Keywords: Lunch intake; Preschool children; Sucrose; Aspartame; Caloric compensation; Milk intake

1. Introduction

The purpose of this study was to examine the eating behavior of a large number of preschool children offered chocolate-flavored or plain milk at lunch. Previously, Wilson and colleagues [8–10] have reported that preschool children consumed significantly more energy at a meal when offered sucrose-sweetened chocolate milk with the meal than they did when served plain milk. The young children drank large quantities of the palatable beverage without decreasing their intake of other food items in the lunchtime meal. The nutrient intakes from the rest of the meal were not affected by the extra energy intake derived from the sweetened milk.

Wilson's findings are inconsistent with those reported by Fomon [6], Birch and Deysher [2,3], and Birch, McPhee, and Sullivan [5], all of which demonstrated convincing evidence of caloric compensation in young children. To test whether Wilson's original findings were accurate, the present experiment was a large-scale replication of Wilson's original [8] study. The number of participants was more than tripled, and midmorning snacks were served to

ensure that all children had equivalent levels of hunger at lunchtime.

In addition, this study was designed to examine whether aspartame-sweetened (sugar-free) chocolate milk also induced an increase in energy intake during the meal. The aspartame-sweetened chocolate milk served had a carbohydrate content (1.85 g per ounce of milk) that was comparable to the carbohydrate content of plain milk (1.85 g per ounce of milk) but less than the carbohydrate content of the sucrose-sweetened chocolate milk (4.2 g per ounce of milk). In contrast, the fat content of the two chocolate milk beverages was higher than the fat content of the plain milk (0.72 g fat per ounce of chocolate milk compared with 0.61 g fat per ounce of plain milk). Consequently, the aspartame-sweetened milk had a slightly higher energy content compared with the plain milk (18.6 kcal/oz compared with 18.1 kcal/oz) and a much lower energy content compared with sucrose-sweetened milk, which had an energy content of 29.4 kcal/oz.

2. Methods

2.1. Participants

A total of 135 children, 63 boys and 72 girls, aged 18–66 months, served as subjects. Of the children aged 18–30

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months, 15 were girls and 13 were boys. Twenty-one girls and 17 boys were between the ages of 31 and 42 months. Of the subjects aged 43–54 months, 22 were girls and 18 were boys. The remaining participants, 14 girls and 15 boys, were between the ages of 55 and 66 months.

The participants were treated in accordance with the ethical standards of the American Psychological Association. Permission to conduct the study was obtained from the county health commissioner, the daycare center administrators, and the children's parents. The subjects were obtained through advertisements in the local newspaper or through letters sent home to parents by their children's daycare center. Parents received letters explaining that the investigator was interested in studying the eating behavior of preschool children and were asked to sign a consent form allowing their child to serve as a subject in the study.

Although the design or purpose of the study was not disclosed in the letter to the parents, a menu of lunches to be used in the study was provided, and parents were asked to circle those items that they did not want their child to be served. Only children who were able to eat all items on the menu served as subjects in this study. Parents who gave consent for the 12-week study to be conducted in their homes received \$50 for each preschool-aged child who participated. For each child enrolled in a participating daycare center during lunchtime, the daycare centers received \$50. Altogether, 27 boys and 19 girls served as subjects in private homes, and 37 boys and 52 girls participated in daycare centers.

2.2. Procedure

The children were served lunchtime meals in their homes or at daycare centers on 2 days a week for 12 weeks. To control the young subjects' appetite at lunch, midmorning snacks (apple juice and rice cakes or crackers with peanut butter, or dry cereal and raisins, or granola bars) were offered each day, 2 h before the test lunch. Four different menus (Table 1) were served on a rotating basis, six times during the 12-week period. Each menu was presented twice with each of three test beverages: plain milk, sucrose-sweetened chocolate milk (milk flavored with Nestle's Quik), or aspartame-sweetened chocolate milk (milk flavored with sugar-free Nestle's Quik).

Lunches were served on Monday and Wednesday or on Tuesday and Thursday to each subject. The participants were offered Meal 1 on Monday (or Tuesday) and Meal 2

on Wednesday (or Thursday) of the first week. The following week, Meal 3 was served on Monday (or Tuesday) and Meal 4 was served on Wednesday (or Thursday). This sequence of meal presentations was repeated for the remainder of the 12-week study.

The order of milk-beverage presentation was varied systematically. With Meals 1 and 4, lunches were presented on Day 1 with plain milk, on Day 2 with sucrose-sweetened chocolate milk, and on Day 3 with aspartame-sweetened chocolate milk. This order was repeated (plain milk, followed by sucrose-sweetened milk, then aspartame-sweetened milk) for the duration of the 12-week study. For Meal 2, children received sucrose-sweetened milk on Day 1, aspartame-sweetened milk on Day 2, and plain milk on Day 3, with this order of presentation being repeated for the duration of the experiment. Aspartame-sweetened milk was served on Day 1 with Meal 3, followed by plain milk on Day 2 and sucrose-sweetened milk on Day 3. Again, this order of presentation was repeated for the duration of the study.

The children were allowed to consume as much as they wanted of any food items, including the beverages. Pre-weighed and premeasured portions were served to the children. At the beginning of the meal, each child was presented with a 4-oz serving of milk beverage, 100 g of the main dish, 50 g of the vegetable dish, and either a slice of whole wheat bread with margarine spread (Meals 1, 2, and 3) or 50 g of french fries (Meal 4). Children called out when they wanted additional servings of any item or when they were ready for their applesauce dessert. An 80-g serving of "natural-style" (unsweetened, Kroger Supermarkets brand) applesauce was initially presented to each subject, but the child was served additional 80-g servings if he or she requested more applesauce.

When the study was conducted in a private home, a research assistant brought the food to the home and stayed with the child in the family's kitchen or dining room while the child ate the test meal. The assistant provided extra portions to the child as the child requested them. If more than one child was serving as a subject in a particular home, a team of assistants came to the home, generally one assistant for each child. The assistants made small talk with the children as they ate and recorded the order in which they selected food items and the amount of time spent eating each item. Parents were asked not to interfere while the child was eating or to encourage the child to eat a particular food item.

When the study was conducted in the daycare setting, the test meal was served by a team of research assistants in the room in which the children normally ate their lunches. The assistants provided extra servings to children as they were requested and also recorded the order in which the children selected food items and the amount of time spent eating each item. The daycare staff either left the room while the study was being conducted or sat in a corner of the room, away from where the children were eating. The staff was instructed not to interfere while the children were eating lunch.

Table 1
Menus of meals served

Meal 1	Meal 2	Meal 3	Meal 4
Macaroni and cheese	Scrambled eggs	Spaghetti and meat sauce	Grilled-cheese sandwich
Broccoli	Spinach	Green beans	Peas
Bread and margarine	Bread and margarine	Bread and margarine	French fries
Applesauce	Applesauce	Applesauce	Applesauce
Milk	Milk	Milk	Milk

Table 2
Milk intake by preschool children during the lunchtime meal

Type of milk beverage	Meal 1		Meal 2		Meal 3		Meal 4	
	Amount (oz)	Energy (Kcal)	Amount (oz)	Energy (Kcal)	Amount (oz)	Energy (Kcal)	Amount (oz)	Energy (Kcal)
Plain	2.8 ^a	52.5 ^a	2.7 ^a	48.6 ^a	2.7 ^a	48.6 ^a	3.6 ^a	65.8 ^a
Sucrose flavored	4.6 ^b	134.3 ^b	4.7 ^b	138.7 ^b	4.7 ^b	138.7 ^b	5.2 ^b	155.1 ^b
Aspartame flavored	4.5 ^b	83.3 ^c	5.0 ^b	93.3 ^c	4.5 ^b	83.3 ^c	5.0 ^b	93.3 ^c

Means in the same column that do not share superscripts differ at $p < 0.05$ in Newman–Keuls comparisons.

After each meal, the amounts of individual food items consumed by each participant was calculated by subtracting the amount remaining from the total served to that child. Energy intakes were calculated using previously reported measures [7]. Multivariate ANOVAs were conducted for each of the food items, food energy, and total energy consumed, using type of milk beverage, the subject's age and gender, and type of setting (private home vs. daycare center) as independent variables. Post hoc Newman–Keuls analyses were performed to detect significant differences between various levels of the independent variables. Because of the prevalence of various childhood illnesses, data were not collected for all children at all meals. Whenever data for a child were incomplete, the child's data were not included in the statistical analyses for that particular meal. Therefore, the total number of subjects varied depending on the meal under analysis.

3. Results

The type of milk beverage served had no significant effect on the consumption of other food items offered at that meal. Subjects did, however, drink significantly more chocolate milk than plain milk during all meals, $F(2, 188) = 11.23$, $p < 0.001$ for Meal 1, $F(2, 172) = 21.79$, $p < 0.001$ for Meal 2, $F(2, 192) = 18.83$, $p < 0.001$ for Meal 3, and $F(2, 186) = 6.16$, $p < 0.01$ for Meal 4 (Table 2). As a result, the preschoolers consumed significantly more calories during those meals in which sucrose-sweetened chocolate milk was served, $F(2, 188) = 12.25$, $p < 0.001$ for Meal 1, $F(2, 172) = 7.90$, $p < 0.001$ for Meal 2, $F(2, 192) = 12.42$, $p < 0.001$ for Meal 3, and $F(2, 186) = 7.72$, $p < 0.001$ for Meal 4 (Table 3).

Newman–Keuls analyses that were conducted on the milk intake data revealed that for every meal, consumption of

plain milk was significantly lower than consumption of either sucrose-sweetened or aspartame-sweetened chocolate milk ($p < 0.05$). The intakes of sucrose-sweetened and aspartame-sweetened milk, in terms of number of ounces drunk by each child, were not significantly different (Table 2). On the other hand, children derived significantly more energy from the sucrose-sweetened milk when it was offered at a meal than from the aspartame-sweetened milk when it was served ($p < 0.05$). Participants also consumed significantly more energy from the aspartame-sweetened milk when it was presented at a meal than they did from plain milk when it was offered ($p < 0.05$). Newman–Keuls analyses of the total energy intake data (milk plus meal kcal) indicated that at all meals, children consumed significantly more energy during meals at which sucrose-sweetened milk was served than they did at meals at which aspartame-sweetened or plain milk was served ($p < 0.05$). Total energy intake was not significantly different between meals at which aspartame-sweetened or plain milk was served (Table 3).

Type of milk beverage offered at a meal had an inconsistent effect on total energy intakes from all foods excluding beverage, $F(2, 188) = 0.89$, NS for Meal 1, $F(2, 172) = 7.79$, $p < 0.001$ for Meal 2, $F(2, 192) = 1.05$, NS for Meal 3, and $F(2, 186) = 3.20$, $p < 0.05$ for Meal 4 (Table 3). For Meals 1 and 3, total energy intake derived from all foods excluding beverage was not significantly different between meals at which chocolate-flavored milk was offered and those at which plain milk was served. In contrast, for Meals 2 and 4, children consumed significantly more energy from all foods excluding beverage at meals with plain milk than they did at meals with chocolate-flavored milk. Newman–Keuls analyses revealed that there were no significant differences in total energy intake from all foods excluding beverage between meals served with sucrose-sweetened milk and those served with aspartame-sweetened milk.

Table 3
Mean energy (kcal) intake by preschool children during the lunchtime meal

Type of milk beverage	Meal 1		Meal 2		Meal 3		Meal 4	
	Food only	Food + milk	Food only	Food + milk	Food only	Food + milk	Food only	Food + milk
Plain	261.9 ^a	314.6 ^a	250.7 ^a	299.6 ^a	219.1 ^a	268.6 ^a	274.6 ^a	342.5 ^a
Sucrose flavored	252.0 ^a	387.7 ^b	214.7 ^b	353.5 ^b	204.4 ^a	344.5 ^b	240.8 ^b	397.5 ^b
Aspartame flavored	242.7 ^a	326.9 ^a	206.0 ^b	299.0 ^a	209.0 ^a	293.5 ^a	248.0 ^b	340.2 ^a

Means in the same column that do not share superscripts differ at $p < 0.05$ in Newman–Keuls comparisons.

Table 4
Mean fat, protein, and carbohydrate intake by preschool children during the lunchtime meal for all food items except beverages

Type of milk beverage	Meal 1 (g)			Meal 2 (g)			Meal 3 (g)			Meal 4 (g)		
	F	P	C	F	P	C	F	P	C	F	P	C
Plain	11.0 ^a	8.4 ^a	32.2 ^a	13.2 ^a	9.7 ^a	25.3 ^a	8.3 ^a	8.2 ^a	31.6 ^a	9.2 ^a	9.5 ^a	41.9 ^a
Sucrose flavored	10.7 ^a	8.1 ^a	30.7 ^a	11.8 ^b	9.0 ^b	19.7 ^b	7.6 ^a	7.7 ^a	29.8 ^a	8.1 ^a	8.4 ^a	36.5 ^b
Aspartame flavored	10.1 ^a	7.6 ^a	30.6 ^a	11.3 ^b	8.4 ^b	19.3 ^b	7.9 ^a	7.9 ^a	30.2 ^a	8.3 ^a	8.7 ^a	37.7 ^b

Means in the same column that do not share superscripts differ at $p < 0.05$ in Newman–Keuls comparisons.
F, fat intake at meal; P, protein intake at meal; C, carbohydrate intake at meal.

To gain a better understanding of the inconsistent effect of milk beverage on total food intake during the different meals, mean fat, protein, and carbohydrate intakes were calculated for each child at each meal (excluding beverages) and compared (Table 4). For Meals 1 and 3, fat, protein, and carbohydrate intake was not significantly different between lunches served with chocolate or plain milk. For Meal 2, preschool children consumed significantly more fat, protein, and carbohydrate at lunches served with plain milk compared with those served with chocolate milk, $F(2, 172) = 4.10$, $p < 0.05$ for fat intake, $F(2, 172) = 3.2$, $p < 0.05$ for protein intake, and $F(2, 172) = 9.18$, $p < 0.001$ for carbohydrate intake. A totally different pattern emerged for Meal 4, however. The preschool subjects consumed significantly more carbohydrate during Meal 4 when plain milk was offered compared with when chocolate milk was offered, but consumption of protein and fat was not affected by the type of milk beverage served, $F(2, 186) = 4.63$, $p < 0.05$ for carbohydrate intake, $F(2, 186) = 2.94$, NS for fat intake, $F(2, 186) = 2.04$, NS, for protein intake.

ANOVAs were also conducted on mean fat, protein, and carbohydrate intakes for all food items at lunch including milk beverage (Table 5). The results of these analyses revealed that for all meals, carbohydrate intakes were significantly higher for all meals at which sucrose-sweetened chocolate milk was consumed, compared with those at which aspartame-sweetened or plain milk was served, $F(2, 188) = 26.28$, $p < 0.001$ for Meal 1, $F(2, 172) = 19.80$, $p < 0.001$ for Meal 2, $F(2, 192) = 23.48$, $p < 0.001$ for Meal 3, and $F(2, 186) = 15.31$, $p < 0.001$ for Meal 4. This higher carbohydrate intake was undoubtedly due to the increased sugar content of the sucrose-sweetened chocolate milk. At Meals 2 and 3 only, significantly more protein was consumed during lunches at which chocolate milk was served, $F(2, 172) = 4.20$, $p < 0.05$ for Meal 2, $F(2, 192) = 5.62$,

and $p < 0.01$ for Meal 3. The significantly higher protein intakes at these meals were most likely related to the increased amounts of milk consumed.

Comparisons of the overall fat, protein, carbohydrate, and energy intakes of the four meals (excluding beverages) revealed that the energy intakes for Meal 3 were significantly lower than those for Meals 1, 2, and 4, $F(3, 383) = 2.71$, $p < 0.05$ (Table 6). Preschool children consumed significantly more fat when eating Meals 1 and 2 than they did with Meals 3 and 4, $F(3, 383) = 10.23$, $p < 0.001$. Carbohydrate intake was significantly highest for Meal 4 and lowest for Meal 2, with carbohydrate intake for Meals 1 and 3 being intermediate between that for Meals 2 and 4, $F(3, 383) = 17.04$, $p < 0.0001$. No significant differences among the four meals for protein intake were detected, $F(3, 383) = 1.26$, NS.

For all milk servings, older children consumed significantly more than did younger children. (Refer to Tables 7–10 for statistical results.) Older children also consumed more calories per lunchtime meal than did younger preschoolers. No consistent age-related differences were observed for main course, bread, fruit, or vegetable servings. In addition, there were no consistent significant differences in food consumption between children served at home and those served at day-care centers. No significant gender differences were detected in any of the statistical analyses conducted, and no significant interactions between independent variables were found.

4. Discussion

Young children do not appear to demonstrate caloric compensation within a meal. In the present study, overconsumption of sweetened chocolate milk was not offset by decreased consumption of other food items during a meal. As

Table 5
Mean fat, protein, and carbohydrate intake by preschool children during the lunchtime meal for all food items including milk beverages

Type of milk beverage	Meal 1 (g)			Meal 2 (g)			Meal 3 (g)			Meal 4 (g)		
	F	P	C	F	P	C	F	P	C	F	P	C
Plain	12.8 ^a	12.1 ^a	37.6 ^a	14.8 ^a	13.2 ^a	30.2 ^a	10.0 ^a	11.7 ^a	36.6 ^a	11.5 ^a	14.2 ^a	48.9 ^a
Sucrose flavored	14.0 ^a	12.9 ^a	50.0 ^b	15.2 ^a	14.6 ^b	39.4 ^b	11.0 ^a	12.6 ^b	49.8 ^b	11.9 ^a	14.0 ^a	58.9 ^b
Aspartame flavored	13.3 ^a	13.4 ^a	38.9 ^a	14.9 ^a	14.9 ^b	28.5 ^a	11.1 ^a	13.7 ^b	38.5 ^a	11.9 ^a	15.1 ^a	46.8 ^a

Means in the same column that do not share superscripts differ at $p < 0.05$ in Newman–Keuls comparisons.
F, fat intake at meal; P, protein intake at meal; C, carbohydrate intake at meal.

Table 6
Comparison of fat, protein, carbohydrate, and energy intakes during the four lunchtime meals for all food items excluding beverages

Lunch number	Intake			
	Fat (g)	Protein (g)	Carbohydrate (g)	Energy (kcal)
1	10.6 ^a	8.0 ^a	31.1 ^a	252.2 ^a
2	12.1 ^a	9.1 ^a	21.3 ^b	223.3 ^a
3	7.9 ^b	7.9 ^a	30.5 ^a	211.4 ^b
4	8.5 ^b	8.9 ^a	38.8 ^c	255.3 ^a

Means in the same column that do not share superscripts differ at $p < 0.05$ in Newman-Keuls comparisons.

a result, the preschoolers consumed significantly more energy during meals at which sucrose-sweetened chocolate milk was served. Although these results corroborate Wilson's original findings [8], they are inconsistent with those reported by others [2,3,5,6].

In Fomon's study [6], babies drank 800–900 mL of a formula with a caloric density of 67 kcal/100 mL and 400–500 mL of a formula that provided 133 kcal/100 mL. However, Fomon did not control the taste of the test formulas, and his subjects might have drunk less of the highly concentrated formula because they did not like the strong taste. Controlling for taste and other sensory characteristics of their test foods, Birch and her colleagues [2,3,5] demonstrated that food intake in preschool children is suppressed following a caloric preload. In contrast, the young participants in the present study drank the sweetened milk beverage throughout the meal, which might account for the difference between the findings from Birch's lab and those from the present study. According to Birch and Fisher [4], 20 to 30 min is the optimal delay between preload and meal for detecting caloric compensation in children.

Nonetheless, Birch and her colleagues [5] observed caloric compensation in children who were served snacks im-

Table 7
Intakes for Meal 1

Food	Age of child (months)			
	18–30	31–42	43–54	55–66
Macaroni and cheese (g)	50.7	51.3	82.7	105.7 ^a
Broccoli (g)	5.2	13.5	16.4	26.2 ^b
Bread and margarine (slices)	0.4	0.5	0.8	0.8
Applesauce (g)	35.2	63.2	79.9	49.9 ^c
Milk (oz)	2.5	3.5	4.6	5.0 ^d
Total energy (kcal)	224.6	290.1	400.1	455.5 ^e

^a For macaroni/cheese intake, significant main effect for age, $F(3, 83) = 6.69$, $p < 0.001$

^b For broccoli intake, significant main effect for age, $F(3, 83) = 3.21$, $p < 0.05$

^c For applesauce intake, significant main effect for age, $F(3, 83) = 3.14$, $p < 0.05$.

^d For milk intake, significant main effect for age, $F(3, 83) = 4.41$, $p < 0.01$

^e For total kilocalorie intake, significant main effect for age, $F(3, 83) = 11.09$, $p < 0.0001$

Table 8
Intakes for Meal 2

Food	Age of child (months)			
	18–30	31–42	43–54	55–66
Scrambled eggs (g)	39.0	53.2	70.6	70.5
Spinach (g)	2.4	4.6	6.1	22.1 ^a
Bread and margarine (slices)	0.6	0.6	1.1	1.4 ^b
Applesauce (g)	48.7	60.9	72.8	81.0
Milk (oz)	2.6	3.5	4.8	5.9 ^c
Total energy (kcal)	195.7	262.2	372.8	412.1 ^d

^a For spinach intake, significant main effect for age, $F(3, 74) = 4.13$, $p < 0.01$

^b For bread intake, significant main effect for age, $F(3, 74) = 3.76$, $p < 0.05$

^c For milk intake, significant main effect for age, $F(3, 74) = 13.77$, $p < 0.0001$

^d For total kilocalorie intake, significant main effect for age, $F(3, 74) = 11.13$, $p < 0.0001$

mediately following a caloric preload, that is, with no delay between the preload and the snack. Those findings are contrary to the results of the present study and are difficult to explain. The energy differences between control (H₂O) and sucrose-sweetened preloads used by Birch et al. [5] did not differ substantially from the energy differences between plain and sucrose-sweetened chocolate milk intake in the present study. In the study of Birch et al. [5], children between the ages of 26 and 49 months exhibited caloric compensation when the energy difference between preloads was 67 kcal. Caloric compensation was also observed by Birch et al. [5] in older children, aged 45–66 months, with an energy difference of 90 kcal between H₂O and sucrose-sweetened preloads. In the present study, average energy differences between intakes of plain and sucrose-flavored milk were 81.8 kcal for Meal 1, 90.1 kcal for Meal 2, 55.4 kcal for Meal 3, and 89.3 kcal for Meal 4.

However, the designs of Birch's and the present study's were quite different from each other, and this difference in design might account for the observed disparity in results. Birch and colleagues' original studies [5] were designed so that each participant was tested four times, once for each type of preload beverage (Experiment 1), or 12 times, once

Table 9
Intakes for Meal 3

Food	Age of child (months)			
	18–30	31–42	43–54	55–66
Spaghetti and meat sauce (g)	56.2	52.2	73.0	84.8
Green beans (g)	2.6	5.7	6.9	8.1
Bread and margarine (slices)	0.6	0.7	1.3	1.4
Applesauce (g)	47.7	59.2	60.3	76.8
Milk (oz)	2.1	3.1	4.7	5.8 ^a
Total energy (kcal)	202.9	255.2	334.5	407.3 ^b

^a For milk intake, significant main effect for age, $F(3, 84) = 13.20$, $p < 0.0001$

^b For total kcal intake, significant main effect for age, $F(3, 84) = 12.34$, $p < 0.0001$

Table 10
Intakes for Meal 4

Food	Age of child (months)			
	18–30	31–42	43–54	55–66
Grilled-cheese sandwich	0.5	0.6	0.8	0.8
Peas (g)	10.9	8.2	12.5	8.2
French fries (g)	32.8	27.7	43.6	52.4 ^a
Applesauce (g)	40.3	58.8	54.4	63.5
Milk (oz)	2.7	4.0	5.7	5.3 ^b
Total energy (kcal)	269.7	315.9	424.7	411.6 ^c

^a For french fries intake, significant main effect for age, $F(3, 83) = 3.91, p < 0.05$

^b For milk intake, significant main effect for age, $F(3, 83) = 5.74, p < 0.01$

^c For total kilocalorie intake, significant main effect for age, $F(3, 83) = 5.52, p < 0.01$

for each type of preload beverage at three different time delays (Experiment 2). In contrast, in the present study, children were tested a total of 24 times each, with four different meals being presented twice with each of three different beverages, which permitted averaging of each subject's intakes.

Another difference between the present study and those conducted by Birch and colleagues is the type of test food offered by the investigators. In the present study and in Wilson's original study [8], a complete meal was served, consisting of a main-course entree, a vegetable entree, bread (or french fries), milk beverage, and applesauce dessert, to her subjects. Birch, McPhee, & Sullivan [5] offered a variety of snacks following the preload, including raisins, cookies, potato chips, crackers, beef franks, and cheese slices. It may be that caloric compensation is more difficult for children when they are served a variety of nutritious foods at meal-time than when they are served snack foods at a time of day when they are not hungry or are not anticipating a meal.

The inconsistent effect of the type of milk beverage on total energy intake from all foods excluding beverage, observed in the present study, might explain the disparity between the results from Birch's studies and those from my lab. Total energy intake from all foods excluding beverage was significantly reduced when chocolate milk was offered at Meal 2, at which scrambled eggs were the main course, and at Meal 4, at which grilled cheese sandwiches and french fries were served. On the other hand, total energy intake from all foods excluding beverage was not affected when chocolate milk was served at Meal 1, at which macaroni and cheese was the main course, and at Meal 3, at which spaghetti with meat sauce was presented to the subjects. It may be that some types of meals or foods facilitate caloric compensation whereas others interfere with intake regulation. This hypothesis merits further testing.

The analyses of fat, carbohydrate, protein, and energy intake at these meals did not aid in our understanding of the inconsistent effects of milk beverage on energy intake during a meal. Whereas energy consumption for all food items

except beverages was reduced at lunches served with chocolate milk for Meals 2 and 4, the fat and carbohydrate intakes associated with these two meals was quite dissimilar. Preschool children consumed more fat and less carbohydrate at Meal 2 compared with the other meals, and they consumed more carbohydrate and less fat at Meal 4 compared with the other meals. That is, energy density was highest for Meal 2 and lowest for Meal 4 in the present study. Therefore, no consistent pattern associated with fat, carbohydrate, protein, or energy content of the four meals can explain the reductions in energy intake observed when chocolate milk was offered during Meals 2 and 4.

Another stated purpose of the present study was to examine food intake in young children when they are offered aspartame-sweetened milk, compared with sucrose-sweetened and plain milk. In the present study, the intake of individual food items was not affected by the type of milk beverage served. Children did drink significantly greater amounts of sucrose-sweetened and aspartame-sweetened milk than they did plain milk. Nevertheless, because sucrose-sweetened milk has a higher energy density than aspartame-sweetened milk, preschoolers consumed significantly more total energy during meals at which sucrose-sweetened milk was offered. The total energy intakes from meals at which aspartame-sweetened milk was offered did not differ significantly from those meals at which plain milk was served. This finding would suggest that aspartame-sweetened milk increases the intake of milk in small children without providing them with the additional calories of sucrose-sweetened milk.

Anderson [1] has reviewed much of the literature on sugar consumption and concluded that the effect of sucrose on food intake is determined by its energy content, that is, that the hedonic properties of sucrose do not override normal food-intake regulation. The findings of the present study, however, demonstrate that (a) young children drink significantly more milk when it is sweetened and flavored with chocolate and (b) they do not reduce the intake of other food items at the meal to compensate for the elevated energy intake that results from increased milk consumption. These data suggest that offering high-energy, palatable drinks with meals might predispose a child to chronic overeating. Studies are currently underway to examine the long-term effects (over the course of a day and over the course of several days) of offering flavored milk to children at meals.

Acknowledgment

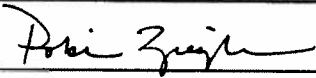
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ATTACHMENT E

MANAGEMENT AND OPERATIONS MEMORANDUM		
MSDE-FNSS	NUMBER 012 (3/05)	
FROM	Robin Ziegler, Chief, School and Community Nutrition Programs Branch	
APPLIES TO	All School Food Authorities	
SUBJECT	Competitive Foods and Foods of Minimal Nutritional Value	
Replaces	Related Policy	Signature
MOM 012 (2/99)	MOM 015	

I. Purpose and Scope

It is the purpose of this Management and Operations Memorandum to promote a healthy school environment by defining the scope of authority of the School Food Authority (SFA) regarding foods and beverages available to students during the school day and to outline the federal and State regulations which apply to serving these foods and beverages in schools and facilities that participate in the School Breakfast Program and the National School Lunch Program. These policies and procedures establish minimum requirements and provide guidance for SFAs electing to set policies which go beyond those contained in this memorandum.

In 2001, *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity* established overweight and obesity as an epidemic in the United States and identified priorities for action to help Americans make healthy lifestyle changes for themselves and their families. Because children spend a large portion of their time in school, schools were identified as a key setting for offering information and programs to promote a healthy lifestyle.

Schools play a powerful role in influencing student behavior. Dietary habits that contribute to student learning and lifelong health are influenced at school. School Meals programs, nutrition education, and physical education programs help students build a foundation for a healthy lifestyle. The school environment must strengthen this foundation by encouraging children to make healthy choices. The procedures outlined in this memorandum are intended to promote a variety of foods in appropriate portions consistent with the *Dietary Guidelines for Americans*. The goal is to educate by example and encourage students to take responsibility for making the best choices for their individual lifestyles and activity levels.

II. Procedures

1. The sale of all items on the list of foods of minimal nutritional value as outlined in Attachment A is prohibited from 12:01 a.m. until the end of the last lunch period. School Food Authorities are strongly encouraged to extend this restriction on the sale of these foods until the end of the standard school day.
2. Each SFA shall establish a nutrition policy, a critical component of the federally mandated wellness policy, for implementation no later than the first day of the 2006-07 school year. SFAs must provide a copy of the nutrition policy to the Maryland State Department of Education (MSDE) by January 31, 2006, and report subsequent changes. The policy will apply to all foods and beverages made available to students from 12:01 a.m. until the end of the standard school day, including those sold à la carte, in vending machines and school stores, and for fundraisers.
3. Reimbursable meals in all schools must meet nutrition standards established by the U.S. Department of Agriculture (USDA). The Maryland State Department of Education encourages SFAs to take the following guidelines into consideration when developing nutrition policies. Components of reimbursable meals that are sold à la carte are not subject to these guidelines.

Foods

Main course food items offered in elementary, middle, and high schools as an alternative to the reimbursable meal should be offered in reasonable portion sizes that are consistent with guidance provided by the USDA for Child Nutrition Programs and that take into consideration the percentage of total calories from both fat and saturated fat. This guidance applies to foods typically sold à la carte, including items such as deluxe pizzas, salads, sandwiches, and yogurt.

In elementary and middle schools, all other food sold, including packaged snacks, should be offered only in single-serving portions. The unit sold, regardless of the number of portions in the package, should contain:

- No more than 9 grams of total fat, excluding packaged nuts and seeds.
- No more than 2 grams of saturated fat.
- No more than 15 grams of sugar, excluding dried fruit with no added sugar.

Beverages

The sale of beverages in all schools during the standard school day is limited to the following:

- Water.
 - Non-carbonated, flavored water with fewer than 20 calories per serving.
 - Unflavored milk or soy milk.
 - Flavored milk or soy milk (no more than 30 grams of total sugar per 8 ounce serving).
 - 100% fruit/vegetable juice, not to exceed 12 ounces.
 - Fruit/vegetable juice beverages with at least 10% fruit/vegetable juice and 100% vitamin C, not to exceed 12 ounces.
 - Isotonic beverages, not to exceed 16 ounces.
4. In high schools, SFA nutrition and wellness policies should reflect the importance of the fat and sugar content of foods and beverages; appropriate portion sizes; student healthy decision-making on food and beverage choice; the role of nutrition education in the school curriculum, including education about abnormal eating behaviors and the importance of physical activity; and developing and promoting opportunities for physical activity before, during and after the school day. SFAs are encouraged to consider the elementary and middle school guidelines for fat and sugar content when developing their high school nutrition and wellness policies.
 5. SFAs are encouraged to form a nutrition integrity team or use an existing local school health council (COMAR 13A.05.05.13), school health advisory board, or a similarly constituted body that includes representatives from school administration, school health, education, physical education, and school food and nutrition services. This team will support the practice of healthy eating, nutrition education, and physical activity in the school environment.
 6. SFAs may implement policies that go beyond the federal and State policies contained in this memorandum.

III. Definitions and Regulations (see CFR 210.11, CFR 220.12)

Competitive Food Services

State Agencies and SFAs shall establish such rules or regulations as are necessary to control the sale of foods other than those available through the School Meals Programs. All income from the sale of competitive foods must accrue to the benefit of the nonprofit school food service or the school or student organizations approved by the school. State agencies and SFAs may impose additional restrictions on the sale of and income from all foods sold at any time throughout schools participating in the School Breakfast Program and the National School Lunch Program.

Foods of Minimal Nutritional Value

Rules and regulations established by State Agencies and SFAs shall prohibit the sale of foods of minimal nutritional value as identified by the Secretary of the USDA and federal regulations governing the National School Lunch Program and School Breakfast Program. These specific food items include:

1. Soda water (includes soda).
2. Water ice.
3. Chewing gum.
4. Certain candies including hard candy, jellies and gums, marshmallow candies, fondant, licorice, and spun candy.
5. Candy-coated popcorn.

A more detailed list is included with this memorandum as Attachment A.

The USDA approves many foods as *exemptions* to the list of foods of minimal nutritional value. Manufacturers may submit a request to the USDA for an exemption from this classification. If the USDA approves the request, the food will be added to the list of exemptions. (See Attachment B.)

Attachments

Categories of Foods of Minimal Nutritional Value

- (1) Soda water - As defined by 21 CFR 165.175 Food and Drug Administration Regulations, except no product shall be excluded from this definition because it contains artificial sweeteners or discrete nutrients added to the food such as vitamins, minerals, and proteins.
- (2) Water ices - As defined by 21 CFR 135.160 Food and Drug Administration Regulations except that water ices which contain fruit or fruit juices are not included in this definition.
- (3) Chewing gum - Flavored products from natural or synthetic gums and other ingredients which form an insoluble mass for chewing.
- (4) Certain candies - Processed foods made predominantly from sweeteners or artificial sweeteners with a variety of minor ingredients which characterize the following types:
 - (a) Hard candy - A product made predominantly from sugar (sucrose) and corn syrup which may be flavored and colored, is characterized by a hard, brittle texture, and includes such items as sour balls, fruit balls, candy sticks, lollipops, starlight mints, after dinner mints, sugar wafers, rock candy, cinnamon candies, breath mints, jaw breakers and cough drops.
 - (b) Jellies and gums - A mixture of carbohydrates which are combined to form a stable gelatinous system of jelly-like character, and are generally flavored and colored, and include gum drops, jelly beans, jellied and fruit-flavored slices.
 - (c) Marshmallow candies - An aerated confection composed of sugar, corn syrup, invert sugar, 20% water and gelatin or egg white to which flavors and colors may be added.
 - (d) Fondant - A product consisting of microscopic-sized sugar crystals which are separated by a thin film of sugar and/or invert sugar in solution such as candy corn, soft mints.
 - (e) Licorice - A product made predominantly from sugar and corn syrup which is flavored with an extract made from the licorice root.
 - (f) Spun candy - A product that is made from sugar that has been boiled at high temperature and spun at a high speed in a special machine.
 - (g) Candy coated popcorn - Popcorn which is coated with a mixture made predominantly from sugar and corn syrup.

These categories of foods identified would provide less than five percent of the United States Recommended Dietary Allowance (USRDA) for each of eight specified nutrients (proteins, vitamin A, ascorbic acid, niacin, riboflavin, thiamin, calcium and iron) per 100 calories and less than five percent of the USRDA for each of the eight specified nutrients per serving. In the case

MOM Number 012

Attachment A

of artificially sweetened flour, only the per serving measure applies. The identified categories of foods of minimal nutritional value will be updated every May 1 and November 1, if changes to foods listed in Attachment B have been made by the USDA.

EXEMPTIONS UNDER THE COMPETITIVE FOODS REGULATION

KNUDSON AND SONS, INC.

Orange Passionfruit Spritzer

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, white grape, passionfruit and orange juice concentrates natural flavors.

Orange Spritzer

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, concentrated white grape and orange juices, natural flavor.

Jamaican Style Lemonade Spritzer

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, white grape and lemon juice concentrates, natural flavors.

FJ FIZZ

Grape flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, concentrated white grape and concord grape juices, concentrated acerola cherry puree, natural flavors.

Cherry flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredients statement:
Sparkling water, concentrated apple, cherry pineapple and plum juices, natural flavors, concentrated acerola cherry puree.

Strawberry flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, concentrated white grape, apple, strawberry and pineapple juices, concentrated acerola cherry puree, natural flavors, grape skin extract (for color).

Raspberry flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredients statement:
Sparkling water, concentrated white grape and raspberry juices, natural flavors, concentrated acerola cherry puree.

Orange flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredients statement:
Sparkling water, concentrated white grape, orange and apple juices, orange oil.

Cherry Cola flavored sparkling fruit juice beverage from concentrates

Labels bearing the above product name will have the following ingredient statement:
Sparkling water, concentrated white grape and cherry juices, natural flavors, concentrated acerola cherry puree.

GREAT BRANDS OF CANADA, LTD

Sparkling Spring Water with natural fruit flavors (Strawberry)

Sparkling Spring Water with natural fruit flavors (Black Cherry)

Sparkling Spring Water with natural fruit flavors (Raspberry)

Sparkling Spring Water with natural fruit flavors (Peach Orange)

Sparkling Spring Water with natural fruit flavors (Watermelon)

Sparkling Spring Water with natural fruit flavors (Lemon Lime)

Labels bearing the above product names will have the following ingredient statement:
Spring water, high fructose corn syrup, citric acid, concentrated fruit juice (Caribbean cherry and/or Kiwi), natural flavors, sodium benzoate, potassium sorbate (as a preservative), ascorbic acid antioxidant, carbon dioxide.

FARLEY FOODS, U.S.A.

Farley's THE ROLL Cherry Fruit Roll slp

Labels bearing the above product name will have the following ingredient statement: Fruit (pears, oranges, cherries) sucrose, maltodextrin, partially hydrogenated vegetable oil (cottonseed, soybean), malic acid, citric acid, glycerol monostearate, natural and artificial flavor, pectin, ascorbic acid (vitamin C), alphotocopherol acetate (vitamin E), beta carotene (vitamin A), red 40.

Farley's THE ROLL Strawberry Fruit Roll slp

Labels bearing the above product name will have the following ingredient statement: Fruit (pears, oranges, strawberries) sucrose, maltodextrin, partially hydrogenated vegetable oil (cottonseed, soybean), malic acid, citric acid, glycerol monostearate, natural and artificial flavor, pectin, ascorbic acid (vitamin C), Alphotocopherol acetate (vitamin E), beta carotene (vitamin A), red 40.

GENERAL MILLS

FRUIT by the FOOT (SPECIAL EDITION)

Color by the Foot, Triple Fruit Punch

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grapes from concentrate, sugar, maltodextrin, pears from concentrate, corn syrup, partially hydrogenated cottonseed oil, carrageenan, citric acid, monoglycerides, sodium citrate, malic acid, acetylated mono and diglycerides, xanthan gum, vitamin C (ascorbic acid), locust bean gum, natural flavor, potassium citrate, yellow 5, red 40, blue 1.

Strawberry Fruit by the Foot

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grape juice from concentrate, sugar, maltodextrin, corn syrup, strawberries from concentrate, partially hydrogenated cottonseed oil, carrageenan, citric acid, acetylated mono and diglycerides, sodium citrate, malic acid, xanthan gum, vitamin C (ascorbic acid), locust bean gum, potassium citrate, natural and artificial flavor, red 40.

Berry Tie-Dye Fruit by the Foot

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grapes from concentrate, sugar, maltodextrin, pears from concentrate, corn syrup, partially hydrogenated cottonseed oil, carrageenan, citric acid, distilled monoglycerides, sodium citrate, malic acid, acetylated mono and diglycerides, xanthan gum, vitamin C (ascorbic acid), locust bean gum, potassium citrate, natural flavor, red 40, blue 1.

Cherry Rage Fruit by the Foot

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grapes from concentrate, sugar, maltodextrin, pears from concentrate, corn syrup, partially hydrogenated cottonseed oil, carrageenan, citric acid, acetylated mono and diglycerides, glycerin, sodium citrate, malic acid, xanthan gum, vitamin C (ascorbic acid), locust bean gum, natural and artificial flavor, potassium citrate, red 40, blue 1.

FRUIT ROLL-UPS (SPECIAL EDITION)

Strawberry Punch Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:

Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, strawberries, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, red 40, glycerin.

Crazy Color Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), glycerin, natural flavor, color (yellow 5, red 40, blue 1).

Screamin' Green Hot Color Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, color (yellow 5, blue 1), glycerin.

Electric Yellow Hot Color Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, yellow 5, glycerin.

Sizzling Red Hot Color Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, high fructose corn syrup, red 40, glycerin.

Tropical Cherry Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement: Pears from concentrate, corn syrup, orange juice from concentrate, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, red 40, glycerin.

Blazin' Blue Hot Color Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, blue #1, glycerin.

Tropical Tie-Dye Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:

Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), natural flavor, red 40, yellow 5, blue 1, glycerin.

Cherry Orange Wildfire Fruit Roll-Up

Labels bearing the above product name will have the following ingredient statement:

Pears from concentrate, orange juice from concentrate, corn syrup, dried corn syrup, sugar, partially hydrogenated cottonseed oil, citric acid, sodium citrate, acetylated mono and diglycerides, pectin, malic acid, vitamin C (ascorbic acid), color (red 40, yellows 5&6), natural flavor.

FRUIT STRING THING (SPECIAL EDITION)

Sneaky Stripes - Double Berry Punch Flavored

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grapes from concentrate, sugar, corn syrup, modified corn starch, pears from concentrate, dried corn syrup, partially hydrogenated cottonseed oil, citric acid, carrageenan, sodium citrate, monoglycerides, malic acid, vitamin C (ascorbic acid), high fructose corn syrup, potassium citrate, natural flavor, yellow 6, blue 1.

Strawberry Punch

Labels bearing the above product name will have the following ingredient statement:

Orange juice from concentrate, grapes from concentrate, corn syrup, sugar, modified corn starch, pears from concentrate, dried corn syrup, partially hydrogenated cottonseed oil, citric acid, carrageenan, sodium citrate, monoglycerides, malic acid, vitamin C (ascorbic acid), potassium citrate, natural flavor, red 40.

FRUIT GUSHERS FRUIT SNACK (SPECIAL EDITION)

Fruit Gushers® Strawberry Punch

(This product will replace the original Fruit Gushers® Strawberry Punch listed below.)

Labels bearing the above product name will have the following ingredient statement:

Pears from concentrate, orange juice from concentrate, sugar, dried corn syrup, corn syrup, modified corn starch, fructose, partially hydrogenated cottonseed oil, grape juice from concentrate, maltodextrin, carrageenan, citric acid, glycerin, distilled monoglycerides, sodium citrate, malic acid, ascorbic acid, natural flavor, potassium citrate, agar-agar, color (red 40), xanthan gum.

Fruit Gushers® Strawberry Punch

(This product is in the process of being phased out and will be replaced by the Fruit Gushers® Strawberry Punch listed above. Both Fruit Gushers® Strawberry Punch fruit snacks are currently exempted products.)

Labels bearing the above product name will have the following ingredient statement:
Pears from concentrate, orange juice from concentrate, sugar, dried corn syrup, corn syrup, modified corn starch, fructose, strawberries from concentrate, partially hydrogenated cottonseed oil, grape juice from concentrate, maltodextrin, carrageenan, citric acid, glycerin, distilled monoglycerides, sodium citrate, malic acid, vitamin C (ascorbic acid), natural flavor, potassium citrate, agar-agar, red #40, xanthan gum.

FRUIT SNACKS (SPECIAL EDITION)

Pokemon™ Rolls® Punch Red

Labels bearing the above product name will have the following ingredient statement:
Orange juice concentrate, grapes from concentrate, sugar, maltodextrin, pears from concentrate, corn syrup, partially hydrogenated cottonseed oil, carrageenan, citric acid, monoglycerides, sodium citrate, malic acid, acetylated mono and diglycerides, xanthan gum, vitamin C (ascorbic acid), locust bean gum, natural flavor, potassium citrate, red 40.

Scooby-Doo Fruit Snacks

Labels bearing the above product name will have the following ingredient statement:
Orange juice from concentrate, corn syrup, sugar, modified corn starch, pectin, citric acid, sodium citrate, dextrose, vitamin C (ascorbic acid), malic acid, mineral oil, potassium citrate, natural and artificial flavor, color (red 40, yellows 5 & 6, blue 1 and other color added), carnauba wax, beeswax, sulfiting agents.

Sunkist Mixed Fruit Snacks

Labels bearing the above product name will have the following ingredient statement:
Orange juice from concentrate, maltodextrin, sugar, corn syrup, modified corn starch, canola oil, citric acid, pectin, vitamin C (ascorbic acid), dextrose, malic acid, sodium citrate, mineral oil, potassium citrate, acetylated mono and diglycerides, natural and artificial flavor, carnauba wax, sucralose, colors (red 40, yellow 5&6, blue 1), beeswax, sulfiting agents.

CANADA PURE WATER COMPANY LTD

SPARKLING REFRESHERS

Wildberry
Black Cherry
Peach
Raspberry

Labels bearing the above product name will have the following ingredient statement:

Spring water, fructose, clarified orange juice concentrate, citric acid, natural flavors, malic acid, ascorbic acid, sodium benzoate (preservative), potassium sorbate (preservative), sodium citrate, CO₂.

Lemon Lime

Orange

Labels bearing the above product names will have the following ingredient statement:

Spring water, fructose, clarified orange juice concentrate, citric acid, natural flavors, ascorbic acid, sodium benzoate (preservative), potassium sorbate (preservative), CO₂.

CLEARLY CANADIAN BEVERAGE CORPORATION

QUENCHER

Grape

Apple

Tropical Lime

Fruit & Berry

Labels bearing the above product names will have the following ingredient statement:

Carbonated water, high fructose corn syrup, natural flavour, concentrated kiwi juice, citric acid, sodium benzoate (to conserve freshness).

NORTH FACE BEVERAGES

Splash Thirst Quencher

Cherry

Labels bearing the above product name have the following ingredient statement:

Carbonated spring water, fructose, corn syrup, lemon, orange, cherry and grape juice concentrates, citric acid, natural flavors, sodium benzoate, potassium sorbate, red 40.

Lemon Lime

Labels bearing the above product name have the following ingredient statement:

Carbonated spring water, fructose, corn syrup, lemon and lime juice concentrates, citric acid, natural flavors, sodium benzoate & potassium sorbate, yellow 5, blue 1.

Grapefruit

Labels bearing the above product name have the following ingredient statement:
Carbonated spring water, fructose, corn syrup, grapefruit juice concentrate, citric acid, potassium citrate, natural flavors, sodium benzoate, potassium sorbate.

Mountainberry

Labels bearing the above product name have the following ingredient statement:
Carbonated spring water, fructose, corn syrup, lemon, grape, strawberry and raspberry juice concentrates, citric acid, natural flavors, sodium benzoate, potassium sorbate, red 40.

Orange

Labels bearing the above product name have the following ingredient statement:
Carbonated spring water, fructose, corn syrup, orange and lemon, juice concentrates, citric acid, potassium citrate, natural flavors, sodium benzoate & potassium sorbate, yellow 6.

Strawberry-Kiwi

Labels bearing the above product name have the following ingredient statement:
Carbonated spring water, fructose, corn syrup, lemon, kiwi, strawberry and grape juice concentrates, citric acid, natural flavors, sodium benzoate, potassium sorbate, red 40.

EASTSIDE BEVERAGE COMPANY

Sparkling Spring Water Fruit Beverage

Orange Passion Fruit Refresher

Labels bearing the above product name have the following ingredient statement: Carbonated Natural Spring Water, concentrated orange and passion fruit juices, high fructose corn syrup, natural passion fruit flavor, natural orange flavor, with other natural flavors.

Red Raspberry Refresher

Labels bearing the above product name have the following ingredient statement: Carbonated Natural Spring Water, concentrated grape, peach, lemon, and raspberry juices, natural raspberry flavor, high fructose corn syrup, with other natural flavors.

Strawberry Kiwi Refresher

Labels bearing the above product name have the following ingredient statement: Carbonated Natural Spring Water, concentrated strawberry and kiwi juices, high fructose corn syrup, natural strawberry and kiwi flavors, with other natural flavors.

Wild Blackberry Refresher

Labels bearing the above product name have the following ingredient statement:
Carbonated Natural Spring Water, concentrated grape and blackberry juices, high fructose corn syrup, natural blackberry flavor, with other natural flavors.

Pink Grapefruit Refresher

Labels bearing the above product name have the following ingredient statement:
Carbonated Natural Spring Water, concentrated grapefruit and grape juices, high fructose corn syrup, natural grapefruit flavor, with other natural flavors.

INTERNATIONAL HOME FOODS

Grist Mill™ Curious George™ Fruit Snacks

Labels bearing the above product name have the following ingredient statement:
Fruit juice from concentrate (apple, pear, grape, strawberry, orange, lemon), corn syrup, sugar, modified food starch, partially hydrogenated vegetable oil (cottonseed and soybean), malic acid, natural and artificial flavors, mineral oil, ascorbic acid (vitamin C), soy lecithin, Blue 1, red 40, yellow 5, yellow 6, beeswax.

PROMOTION IN MOTION, INC.

DINOSAURS Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement: Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lime, or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, red #40, yellow #5, blue #1, yellow #6 and beeswax.

FRUIT PARADE® Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement: Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lemon, apple or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, carnauba wax, red #40, yellow #5, blue #1, yellow #6 and beeswax.

ALL STARS Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement:
Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lemon, apple or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, carnauba wax, red #40, yellow #5, blue #1, yellow #6 and beeswax.

Pirate's TREASURE™ Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lemon, apple or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, carnauba wax, red #40, yellow #5, blue #1, yellow #6 and beeswax.

JAWS™ Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lemon, apple or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, carnauba wax, red #40, yellow #5, blue #1, yellow #6 and beeswax.

TRICKERTREATS™ HALLOWEEN TIME Real Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Juice from concentrate (pineapple, pear, peach), acerola, fruit puree (strawberry, cherry, orange, lemon, apple or grape), corn syrup, sucrose, gelatin, modified corn starch, citric acid, lactic acid, pectin, natural and artificial flavors, hydrogenated soybean oil, mineral oil, carnauba wax, red #40, yellow #5, blue #1, yellow #6 and beeswax.

WELCH'S® Fruit Snacks Mixed Fruit

Labels bearing the above product name have the following ingredient statement:

Juice from concentrates (grape, peach, pear and pineapple), corn syrup, sugar, modified corn starch, fruit puree (grape, apple, strawberry and raspberry), gelatin, citric acid, lactic acid, natural and artificial flavors, coconut oil, carnauba wax, ascorbic acid (vitamin C), vitamin A palmitate and beta carotene (vitamin A), alpha tocopherol acetate (vitamin E), red 40, blue 1, yellow 6 and yellow 5.

GAGE FOODS

Fruit Shapes Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Fruit juice from concentrate (orange, cherry, grape, strawberry, lemon, apple), corn syrup, sugar, gelatin, sorbitol, malic acid, ascorbic acid, sodium citrate, natural and artificial flavors, mineral oil, carnauba wax, red #40, blue #1, yellow #6, yellow #5.

BRACH'S CONFECTIONS, INC.

Hi-C® Fruit Snack

Labels bearing the above product name will have the following ingredient statement:

Fruit juice concentrates (orange, grape, strawberry, apple, cherry, and lemon), corn syrup, sugar, gelatin, sorbitol, malic acid, ascorbic acid, (vitamin C), sodium citrate, natural and artificial flavors, mineral oil, carnauba wax, red 40, yellow 6 yellow 5, blue 1.

Froot Loops Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Corn syrup, sugar, orange juice concentrate, modified corn starch, gelatin, sorbitol, citric acid, natural and artificial flavors, sodium citrate, ascorbic acid (vitamin C), mineral oil, corn oil, tocopherol acetate (vitamin E), carnauba wax, vitamin A palmitate, red 40, yellow 6, blue 1, yellow 5.

Clifford, the Big Red Dog™ Fruit Snacks

Labels bearing the above product name have the following ingredient statement:

Corn Syrup, Sugar, Orange Juice Concentrate, Modified Corn Starch, Gelatin, Sorbitol, Citric Acid, Natural and Artificial Flavors, Sodium Citrate, Ascorbic Acid (Vitamin C), Mineral Oil*, Corn Oil*, Tocopherol Acetate (Vitamin E), Carnauba Wax*, Vitamin A Palmitate, Red 40, Yellow 6, Yellow 5, Blue 1. *Adds a dietarily insignificant amount of fat.

MAC FARMS, INC.

e-Moo Carbonated Dairy-Based Beverage

Labels bearing the above product name have the following ingredient statement:

Skim milk, crystalline fructose, natural & artificial flavors, vitamin A palmitate, vitamin D₃, carbon dioxide.

RWI RESOURCES, LLC

RIPTIDE SPARKLING FLAVORED WATER BEVERAGES

Riptide Sparkling Flavored Water – Strawberry

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

Riptide Sparkling Flavored Water – Black Cherry

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

Riptide Sparkling Flavored Water – Raspberry

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

Riptide Sparkling Flavored Water – Lemon-Lime

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

Riptide Sparkling Flavored Water – Orange

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

Riptide Sparkling Flavored Water – Wildberry

Labels bearing the above product name have the following ingredient statement:

Filtered Water, High Fructose Corn Sweetener, Calcium Lactate, Citric Acid, Natural Flavor, Acerola Juice Concentrate, Sodium Benzoate and Potassium Sorbate as Preservatives, Ascorbic Acid (Vitamin C), CO₂.

IZZE BEVERAGE COMPANY

IZZE 100% PURE FRUIT JUICE AND SPARKLING WATERS

Sparkling Clementine

Labels bearing the above product name have the following ingredient statement:

Sparkling water, white grape juice concentrate, orange juice concentrate, apple juice concentrate, lemon juice concentrate, natural flavor, gum acacia (from acacia trees), ester gum, beta-carotene (color).

Sparkling Grapefruit

Labels bearing the above product name have the following ingredient statement:

Sparkling water, grape juice concentrate, grapefruit juice concentrate, lemon juice concentrate, natural flavor, gum acacia (from acacia trees), ester gum, red cabbage extract (color).

Sparkling Blackberry

Labels bearing the above product name have the following ingredient statement:

Sparkling water, grape juice concentrate (white and red), apple juice concentrate, black raspberry juice concentrate, natural flavor, lemon juice concentrate, gum acacia (from acacia trees), ester gum.

Sparkling Lemon

Labels bearing the above product name have the following ingredient statement:

Sparkling water, grape juice concentrate, apple juice concentrate, lemon juice concentrate, natural flavor, gum acacia (from acacia trees), ester gum.

Sparkling Pear

Labels bearing the above product name have the following ingredient statement:

Sparkling water, pear juice concentrate, grape juice concentrate, lemon juice concentrate, natural flavor, gum acacia (from acacia trees), ester gum.

SWITCH BEVERAGE COMPANY

SWITCH BEVERAGE COMPANY CARBONATED JUICE BEVERAGES

Orange Tangerine

Labels bearing the above product name have the following ingredient statement:

100% juice (filtered sparkling water sufficient to reconstitute juice concentrates, white grape, apple, orange, tangerine juice concentrates) natural flavor and color, ascorbic acid (Vitamin C).

Apricot Peach

Labels bearing the above product name have the following ingredient statement:

100% juice (filtered sparkling water sufficient to reconstitute juice concentrates, white grape, apple, pear, peach, apricot juice concentrates) natural flavor and color, ascorbic acid (Vitamin C).

Orange Mango

Labels bearing the above product name have the following ingredient statement:

100% juice (filtered sparkling water sufficient to reconstitute juice concentrates, apple, grape, orange, mango juice concentrates) natural flavor and color, ascorbic acid (Vitamin C).

Watermelon Strawberry

Labels bearing the above product name have the following ingredient statement:

100% juice (filtered sparkling water sufficient to reconstitute juice concentrates, white grape, apple, strawberry, watermelon juice concentrates) natural flavor and color, ascorbic acid (Vitamin C).

ATTACHMENT F

Nutrition Standards for Competitive Foods in Pennsylvania Schools for the School Nutrition Incentive

On July 20, 2007, legislation was enacted to change the School Code for the Commonwealth of Pennsylvania to provide a supplemental state reimbursement for each breakfast and lunch served as part of the National School Lunch Program and School Breakfast Program. This applies to all schools that adopt and implement, as part of their wellness policy, the Department of Education's nutritional guidelines for food and beverages available on each school campus.

The following nutrition standards must be implemented in all identified areas, exactly as written* in order for schools to receive the supplemental state reimbursement. At a minimum, Year One of the standards must be implemented in the 2007-2008 School Year, and, at a minimum, Year Two of the standards must be implemented on or before the 2008-2009 School Year and each school year thereafter.

* Schools that exceed the standards will also qualify for the additional reimbursement. For example, if a school offers no ala carte or vending machine items, they are exceeding the standards in those specific areas.

Contact:

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Nutrition Standards for Competitive Foods in Pennsylvania Schools

Source of Competitive Food	Year One Implemented by 2007-2008 School Year	Year Two Implemented by 2008-2009 School Year	Best Practice Optional (not required for School Nutrition Incentive Reimbursement)
<p>Ala Carte-Food/Snacks</p> <ul style="list-style-type: none"> *Foods offered through the National School Lunch or School Breakfast Programs may qualify towards meeting this requirement if the item is also offered for sale as an ala carte item. ** Includes any item served as a competitive food whether it is part of a reimbursable school meal or solely a competitive food. 	<p>Any item that is served ala carte, if it is a component of the National School Lunch (NSL) menu for that school day, is exempt from these guidelines.</p> <p>The following standards apply to <u>all</u> foods offered as ala carte.</p> <ul style="list-style-type: none"> • Items will be packaged in single serving sizes. • A selection/variety of whole grains will be available on a daily basis. * (Table 1) • A minimum of 1 fresh fruit and vegetable will be offered daily. A variety of fruits and vegetables will be offered from day to day.* • No foods will be on-site deep fat fried. This does not include stir-fried or sautéed foods. Pre-fried or flash fried foods will not be offered more than 4 times per week. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. <p>In addition, the majority of items offered will:</p> <ul style="list-style-type: none"> • Not contain added sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) 	<p>Any item that is served ala carte, if it is a component of the National School Lunch (NSL) menu for that school day, is exempt from these guidelines <u>except</u> for the limit on pre-fried and flash-fried foods below (i.e., they will not be offered more than three times per week).</p> <p>In addition to the reimbursable meal, elementary ala carte items will be limited to one item, which cannot duplicate the reimbursable meal, except for fruits or vegetables. In middle and high schools, only one exempted component ala carte item can duplicate another item sold to the student, except for fruits or vegetables.</p> <p>The following standards apply to non-exempt foods offered ala carte:</p> <ul style="list-style-type: none"> • Items will be packaged in single serving sizes • Items will provide < 250 calories per serving • A minimum of 3 fruits and 3 vegetables will be offered daily (at least 1 of each being fresh/raw). A variety of fruits and vegetables will be offered from day to day.* • No foods will be on-site deep fat fried. This does not include stir-fried or sautéed foods. Pre-fried or flash fried foods will not be offered more than 2 times per week. These 2 items are exempt from the total fat and saturated fat restrictions listed below.** • At least 50% of grains offered will be whole grain.* (Table 1) • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. <p>In addition, <u>all</u> food items will contain:</p> <ul style="list-style-type: none"> • <35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • <10% of calories from saturated fat (excluding reduced fat cheeses). 	<p>The following standards apply to <u>all</u> foods offered as ala carte.</p> <ul style="list-style-type: none"> • Items will provide <250 calories per serving. • Items will be packaged in single serving sizes. • A minimum of 3 fruits and 3 vegetables will be offered daily (at least 1 of each being fresh/raw). A variety of fruits and vegetables will be offered from day to day.* • No foods will be on-site deep fat fried. This does not include stir-fried or sautéed foods. Pre-fried or flash fried foods will not be offered more than 2 times per week. These 2 items are exempt from the total fat and saturated fat restrictions listed below.** • At least 50% of grains offered will be whole grain.* (Table 1) • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. <p>In addition, <u>all</u> food items will contain:</p> <ul style="list-style-type: none"> • <35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • <10% of calories from saturated fat (excluding reduced fat cheeses).

Nutrition Standards for Competitive Foods in Pennsylvania Schools

Source of Competitive Food	Year One Implemented by 2007-2008 School Year	Year Two Implemented by 2008-2009 School Year	Best Practice Optional (not required for School Nutrition Incentive Reimbursement)
<p>Ala Carte-Food/Snacks – cont.</p> <p>*Foods offered through the National School Lunch or School Breakfast Programs may qualify towards meeting this requirement if the item is also offered for sale as an ala carte item.</p> <p>** Includes any item served as a competitive food whether it is part of a reimbursable school meal or solely a competitive food.</p>	<p>Marketing, pricing and nutrition education strategies will be used to encourage selection of the healthier foods.</p>	<p>week. **</p> <ul style="list-style-type: none"> At least 50% of grains offered will be whole grain.* Foods of Minimal Nutritional Value (USDA regulation 7 CFR 210 and 220) will not be available anytime during the school day. <p>In addition, a minimum of 75% of items available will:</p> <ul style="list-style-type: none"> Contain < 35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). Contain <10% of calories from saturated fat (excluding reduced fat cheeses). Contain <35% sugar by weight (excluding naturally occurring sugars and low fat yogurts). Not contain sugar as the first ingredient. (Table 3) Provide minimal to no trans fatty acids. (Table 4) <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of foods meeting these standards and combinations that result in a reimbursable meal.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>	<ul style="list-style-type: none"> <35% sugar by weight (excluding naturally occurring sugars and low fat yogurts) and added sugar will not be listed as the first ingredient. (Table 3) Minimal to no trans fatty acids. (Table 4) <p>Elementary students will be limited to the purchase of one item, which cannot duplicate the reimbursable meal, except for fruits and vegetables.</p> <p>In middle school and high school ala carte items will be limited to two items and cannot duplicate another item sold to the students, except for fruits and vegetables.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>

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<p>Ala carte-Beverages</p>	<p>A minimum of 75% of the beverages offered will be:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener (Table 6) for middle or secondary (limit 17 oz.). • 100% fruit juice (not to exceed 12 oz). • Milk, 2% reduced fat, 1% lowfat or nonfat (not to exceed 16 oz), flavored or unflavored (not to exceed 32 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar). • Carbonated beverages with a minimum of 70% pure juice and no other added ingredients, excluding water, will be allowed (in order to be sold ala carte, the item must be exempted by USDA from being a Food of Minimal Nutritional Value). <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of the beverages listed above.</p> <p>Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the</p>	<p>All of the water and 100% juice offered will be one of the following:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener (Table 6) for middle or secondary (limit 17 oz.); not to surpass 25% of all water and 100% juice available. • 100% fruit juice (not to exceed 8 oz. for elementary and 12 oz. for secondary). <p>A minimum of 75% of the milk offered will be:</p> <ul style="list-style-type: none"> • 2% reduced fat, 1% lowfat or nonfat (not to exceed 8 oz for elementary and 12 oz. for secondary), flavored or unflavored (not to exceed 30 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar, or include artificial sweetener- Table 6). <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of the beverages listed above.</p> <p>Carbonated beverages with a minimum of 70% pure juice and no other added ingredients excluding water, will be allowed (in order to be sold ala carte, the item must</p>	<p><u>All</u> beverages will meet these criteria.</p> <ul style="list-style-type: none"> • Plain water or flavored with no sugar or artificial sweeteners (Table 6) (any size). • 100% fruit juice (not to exceed 6 oz). • Milk: A minimum of 75% of milk selections will be 1% lowfat or nonfat (not to exceed 8 oz), flavored or unflavored (not to exceed 30 grams of sugar, inclusive of naturally occurring sugar). Preferably packaged in plastic resealable containers.

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Source of Competitive Food	Year One Implemented by 2007-2008 School Year	Year Two Implemented by 2008-2009 School Year	Best Practice Optional (not required for School Nutrition Incentive Reimbursement)
<p>Ala carte-Beverages-cont.</p>	<p>school day</p>	<p>be exempted by USDA from being a Food of Minimal Nutritional Value).</p> <p>Any beverage that does not meet the criteria in the above mentioned standards (not to surpass 25% of items available) will not exceed:</p> <ul style="list-style-type: none"> • 150 calories per package • 35 grams of sugar per package <p>Foods of Minimal Nutritional Value (USDA regulation 7 CFR 210 and 220) will not be available anytime during the school day.</p>	
<p>Vending-Food/Snacks</p>	<p>The following standards apply to <u>all</u> foods offered through vending machines.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. <p>In addition, the majority of items offered will:</p> <ul style="list-style-type: none"> • Not be fried. (Table 2) • Not contain added sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) <p>Marketing, pricing and nutrition education strategies will be used to encourage selection of the healthier foods.</p>	<p>The following standards apply to <u>all</u> foods offered through vending machines.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. • Items will provide < 250 calories per serving. • At least 50% of grains offered will be whole grain. • Contain < 35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • Contain <10% of calories from saturated fat (excluding reduced fat cheeses). • Contain <35% sugar by weight (excluding naturally occurring 	<p>Vending will not be available for elementary students. In secondary grades, the following standards apply to <u>all</u> foods offered through vending machines.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. • Items will provide < 250 calories per serving. • At least 50% of grains offered will be whole grain. • Contain < 35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • Contain <10% of calories from saturated fat (excluding reduced fat cheeses).

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Vending-Food/Snacks-cont.		<ul style="list-style-type: none"> • sugars and low fat yogurts). • Not contain sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) • Not be fried (Table 2) <p>Vending for elementary students must only offer selections from this list:</p> <ul style="list-style-type: none"> • fruits • vegetables • yogurts, low-fat yogurts and reduced-fat cheeses <p>Fruits or vegetables will be available in at least one food vending area, and in all vending areas where refrigerated vending is available.</p> <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of foods meeting these standards.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>	<ul style="list-style-type: none"> • Contain <35% sugar by weight (excluding naturally occurring sugars and low fat yogurts). • Not contain sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) • Not be fried (Table 2) <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>

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<p>Vending-Beverages</p>	<p>A minimum of 75% of beverages offered will be:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener (Table 6) for middle or secondary (limit 17 oz.). • 100% fruit juice (not to exceed 12 oz). • Milk, 2% reduced fat, 1% lowfat or nonfat (not to exceed 16 oz), flavored or unflavored (not to exceed 32 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar). • Carbonated beverages with a minimum of 70% pure juice and no other added ingredients, excluding water, will be allowed (in order to be sold ala carte, the item must be exempted by USDA from being a Food of Minimal Nutritional Value). <p>Any beverage that does not meet the criteria in the above mentioned standards (not to surpass 25% of items available) will not exceed:</p> <ul style="list-style-type: none"> • 150 calories per package • 35 grams of sugar per package 	<p>Vending for elementary students must only contain water, 100% fruit juice and milk, subject to the limits below.</p> <p>The following standards apply to all beverages offered through all vending machines.</p> <p>All of the water and 100% juice offered will be one of the following:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener for middle or secondary (limit 17 oz.); not to surpass 25% of all water and 100% juice available • 100% fruit juice (not to exceed 8 oz. for elementary and 12 oz. for secondary). <p>A minimum of 75% of the milk offered will be:</p> <ul style="list-style-type: none"> • 2% reduced fat, 1% lowfat or nonfat (not to exceed 8 oz for elementary and 12 oz. for secondary), flavored or unflavored (not to exceed 30 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar, or include artificial sweetener-Table 6). 	<p><u>All</u> beverages will meet these criteria.</p> <ul style="list-style-type: none"> • Plain water or flavored with no sugar or artificial sweeteners (Table 6) (any size). • 100% fruit juice (not to exceed 6 oz). • Milk: A minimum of 75% of milk selections will be 1% lowfat or nonfat (not to exceed 8 oz), flavored or unflavored (not to exceed 30 grams of sugar, inclusive of naturally occurring sugar). Preferably packaged in plastic resealable containers.

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Source of Competitive Food	Year One Implemented by 2007-2008 School Year	Year Two Implemented by 2008-2009 School Year	Best Practice Optional (not required for School Nutrition Incentive Reimbursement)
<p>Vending-Beverages-cont.</p>		<p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of the beverages listed above.</p> <p>Carbonated beverages with a minimum of 70% pure juice and no other added ingredients, excluding water, will be allowed (in order to be sold ala carte, the item must be exempted by USDA from being a Food of Minimal Nutritional Value).</p> <p>Any beverage that does not meet the criteria in the above mentioned standards (not to surpass 25% of items available) will not exceed:</p> <ul style="list-style-type: none"> • 150 calories per package • 35 grams of sugar per package <p>Foods of Minimal Nutritional Value (USDA regulation 7 CFR 210 and 220) will not be available anytime during the school day.</p>	

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Source of Competitive Food	Year One Implemented by 2007-2008 School Year	Year Two Implemented by 2008-2009 School Year	Best Practice Optional (not required for School Nutrition Incentive Reimbursement)
<p>Fundraisers (non-vending)</p>	<p>All food items sold as fundraisers, available for sale <u>during</u> the school day, will follow the standards listed below.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. • Foods will not be fried. (Table 2) • Foods will not contain added sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) <p>Marketing, pricing and nutrition education strategies will be used to encourage selection of the healthier foods.</p>	<p>All food items sold as fundraisers on school property and available for sale during the school day must meet the guidelines below and will be reviewed by the principal of the school. Any fundraising group will receive a list of fundraising foods that meet these guidelines prior to the commencement of the fundraiser. The school food service director shall assist the principal in determining the suitability of fundraising items in accordance with the guidelines.</p> <ul style="list-style-type: none"> • Items will provide < 250 calories per serving. • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. • Total fat will be <35% of the total calories (excluding nuts, seeds, nut butters and reduced fat cheeses) • Saturated fat will be < 10% of the total calories. • Sugar content will be < 35% by weight (excluding naturally occurring sugars and low fat yogurts) and added sugar will not be listed as the first ingredient. (Table 3) • Items will contain minimal to no trans fatty acid. (Table 4) 	<p>All food items sold as fundraisers on school property and available for sale during the school day must meet the guidelines below and will be reviewed by the principal of the school. Any fundraising group will receive a list of fundraising foods that meet these guidelines prior to the commencement of the fundraiser. The school food service director shall assist the principal in determining the suitability of fundraising items in accordance with the guidelines.</p> <ul style="list-style-type: none"> • Items will provide < 250 calories per serving. • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. • Total fat will be <35% of the total calories (excluding nuts, seeds, nut butters and reduced fat cheeses) • Saturated fat will be < 10% of the total calories. • Sugar content will be < 35% by weight (excluding naturally occurring sugars and low fat yogurts) and added sugar will not be listed as the first ingredient. (Table 3) • Items will contain minimal to no trans fatty acid. (Table 4)

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Fundraisers (non-vending)-cont.		<p>Food items will be available no earlier than 30 minutes after the last meal period of the day.</p> <p>Alternate revenue generating sources will be developed. Following are resources: www.kidseatwell.org/flyers/twentywaystora isefunds.pdf; http://www.sde.ct.gov/sde/lib/sde/PDF/DEPS/S/Student/NutritionEd/Healthy_Fundraising_Color.PDF.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>	<p>Food items will be available no earlier than 30 minutes after the last meal period of the day.</p> <p>Alternate revenue generating sources will be developed. Following are resources: www.kidseatwell.org/flyers/twentywaystora sefunds.pdf; http://www.sde.ct.gov/sde/lib/sde/PDF/DEPS/Student/NutritionEd/Healthy_Fundraising_Color.PDF.</p> <p>***Foods sold as fundraisers that are available for sale outside of the school day will support healthy eating by limiting foods high in added sugar, fat, sodium or trans fat content.</p> <p>For additional information regarding foods available for sale outside of the school day, reference Local Wellness Policy Frequently Asked Questions, page 3, which is available at http://www.pde.state.pa.us/food_nutrition/lib/food_nutrition/local_wellness_policy_q_and_as_final_12_26_06.pdf.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>

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<p>Classroom Parties/Holiday Celebrations</p>	<p>Classroom parties will offer minimal amount of foods (maximum 2-3 items) that contain added sugar as the first ingredient (Table 3) and will provide the following:</p> <ul style="list-style-type: none"> • Fresh fruits and vegetables. • Water, 100% fruit juice or milk. 	<p>Classroom parties will offer minimal amount of foods (maximum 2-3 items) that contain added sugar as the first ingredient (Table 3) and will provide the following:</p> <ul style="list-style-type: none"> • Fresh fruits and vegetables. • Water, 100% fruit juice or milk. <p>In addition, Food Service Departments will offer party lists/menus that include food and beverage choices that:</p> <ul style="list-style-type: none"> • Are moderate in sodium content. • Provide minimal to no trans fatty acids. • Provide items that contain > 2 grams of fiber/serving. • Offer fresh fruits and vegetables. • Offer water, 100% fruit juice or milk as the beverage choices. • Do not offer any Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220). <p>Parents and teachers will be encouraged to purchase foods and beverages from this menu of items.</p>	<p>Classroom parties will offer minimal amount of foods (maximum 2-3 items) that contain added sugar as the first ingredient (Table 3) and will provide the following:</p> <ul style="list-style-type: none"> • Fresh fruits and vegetables. • Water, 100% fruit juice or milk. <p>In addition, Food Service Departments will offer party lists/menus that include food and beverage choices that:</p> <ul style="list-style-type: none"> • Are moderate in sodium content. • Provide minimal to no trans fatty acids. • Provide items that contain > 2 grams of fiber/serving. • Offer fresh fruits and vegetables. • Offer water, 100% fruit juice or milk as the beverage choices. • Do not offer any Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220). <p>Parents and teachers will be encouraged to purchase foods and beverages from this menu of items.</p>

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Rewards	<p>Food will not be used as a reward for classroom or school activities unless the reward is an activity that promotes a positive nutrition message (ie., guest chef, field trip to a farm or farmers market, etc.).</p> <p>Alternate ideas can be found at: www.cspinet.org/nutritionpolicy/constructive_rewards.pdf. http://www.sde.ct.gov/sde/lib/sde/PDF/DEPS/Student/NutritionEd/Food_As_Reward_HO1.pdf.</p>	<p>Food will not be used as a reward for classroom or school activities unless the reward is an activity that promotes a positive nutrition message (ie., guest chef, field trip to a farm or farmers market, etc.).</p> <p>Alternate ideas can be found at: www.cspinet.org/nutritionpolicy/constructive_rewards.pdf. http://www.sde.ct.gov/sde/lib/sde/PDF/DEPS/Student/NutritionEd/Food_As_Reward_HO1.pdf.</p>	<p>Food will not be used as a reward for classroom or school activities unless the reward is an activity that promotes a positive nutrition message (ie., guest chef, field trip to a farm or farmers market, etc.).</p> <p>Alternate ideas can be found at: www.cspinet.org/nutritionpolicy/constructive_rewards.pdf. http://www.sde.ct.gov/sde/lib/sde/PDF/DEPS/Student/NutritionEd/Food_As_Reward_HO1.pdf.</p>
Foods from Home	N/A	<p>Parents/caregivers will be encouraged to promote their child’s participation in the school meals programs. If their child does not participate in the school meals programs, parents/caregivers will be encouraged to provide a healthy alternative.</p> <p>All nutrition standards will be explained to parents/caregivers. They will continuously be provided with nutrition education and encouraged to comply with the nutrition policies to the best of their ability and knowledge. Examples of nutrition education outreach include newsletters, open houses, back to school nights, family nights, etc.</p>	<p>Parents/caregivers will be encouraged to promote their child’s participation in the school meals programs. If their child does not participate in the school meals programs, parents/caregivers will be encouraged to provide a healthy alternative.</p> <p>All nutrition standards will be explained to parents/caregivers. They will continuously be provided with nutrition education and encouraged to comply with the nutrition policies to the best of their ability and knowledge. Examples of nutrition education outreach include newsletters, open houses, back to school nights, family nights, etc.</p>
School Stores-Foods/Snacks	<p>The following standards apply to <u>all</u> foods sold in school stores.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • No foods will be on-site deep fat fried. 	<p>The following standards apply to <u>all</u> foods sold in school stores.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 	<p>The following standards apply to <u>all</u> foods sold in school stores.</p> <ul style="list-style-type: none"> • Packages will be in single serving sizes. • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and

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	<ul style="list-style-type: none"> • Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the school day. <p>In addition, the majority of items offered will:</p> <ul style="list-style-type: none"> • Not be fried. (Table 2) • Not contain added sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of foods meeting these standards.</p>	<p>210 and 220) will not be available anytime during the school day.</p> <ul style="list-style-type: none"> • Items will provide < 250 calories per serving. • At least 50% of grains offered will be whole grains. • Contain < 35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • Contain <10% of calories from saturated fat (excluding reduced fat cheeses). • Contain <35% sugar by weight (excluding naturally occurring sugars and low fat yogurts). • Not contain sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) • Not be fried (Table 2) <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of foods meeting these standards.</p> <p>School stores will not sell food until 30 minutes after the last meal period of the day.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight.</p>	<p>220) will not be available anytime during the school day.</p> <ul style="list-style-type: none"> • Items will provide < 250 calories per serving. • At least 50% of grains offered will be whole grains. • Contain < 35% of calories from total fat (excluding nuts, seeds, nut butters, and reduced fat cheeses). • Contain <10% of calories from saturated fat (excluding reduced fat cheeses). • Contain <35% sugar by weight (excluding naturally occurring sugars and low fat yogurts). • Not contain sugar as the first ingredient. (Table 3) • Provide minimal to no trans fatty acids. (Table 4) • Not be fried (Table 2) <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of foods meeting these standards.</p> <p>School stores will not sell food until 30 minutes after the last meal period of the day.</p> <p>Table 5 contains formulas for calculating total fat, saturated fat, and sugar by weight..</p>

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<p>School Stores-Beverages</p>	<p>A minimum of 75% of the beverages offered will be:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener (Table 6) for middle or secondary (limit 17 oz.); • 100% fruit juice (not to exceed 12 oz). • Milk, 2% reduced fat, 1% lowfat or nonfat (not to exceed 16 oz), flavored or unflavored (not to exceed 32 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar). • Carbonated beverages with a minimum of 70% pure juice and no other added ingredients, excluding water, will be allowed (in order to be sold ala carte, the item must be exempted by USDA from being a Food of Minimal Nutritional Value). <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of the beverages listed above.</p> <p>Foods of Minimal Nutritional Value (USDA regulation 7CFR 210 and 220) will not be available anytime during the</p>	<p>The following standards apply to <u>all</u> beverages sold in school stores.</p> <p>All of the water and 100% juice offered will be one of the following:</p> <ul style="list-style-type: none"> • Plain water or flavored water, no sugar or artificial sweeteners (Table 6) for elementary, middle or secondary (any size). • Water flavored with artificial sweetener (Table 6) for middle or secondary (limit 17 oz.); not to surpass 25% of all water and 100% juice available • 100% fruit juice (not to exceed 8 oz. for elementary and 12 oz. for secondary). <p>A minimum of 75% of the milk offered will be:</p> <ul style="list-style-type: none"> • 2% reduced fat, 1% lowfat or nonfat (not to exceed 8 oz for elementary and 12 oz. for secondary), flavored or unflavored (not to exceed 30 grams of sugar per 8 ounce serving, inclusive of naturally occurring sugar, or include artificial sweetener-Table 6). <p>Carbonated beverages with a minimum of 70% pure juice and no other added ingredients, excluding water, will be allowed (in order to be sold ala carte, the</p>	<p><u>All</u> beverages will meet these criteria.</p> <ul style="list-style-type: none"> • Plain water or flavored with no sugar or artificial sweeteners (Table 6) (any size). • 100% fruit juice (not to exceed 6 oz). • Milk: A minimum of 75% of milk selections will be 1% lowfat or nonfat (not to exceed 8 oz), flavored or unflavored (not to exceed 30 grams of sugar, inclusive of naturally occurring sugar). Preferably packaged in plastic resealable containers.

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School Stores- Beverages - cont.	school day.	<p>item must be exempted by USDA from being a Food of Minimal Nutritional Value).</p> <p>Any beverage that does not meet the criteria in the above mentioned standards (not to surpass 25% of items available) will not exceed:</p> <ul style="list-style-type: none"> • 150 calories per package • 35 grams of sugar per package <p>Marketing, pricing and nutrition education strategies will be used to encourage the selection of the beverages listed above.</p> <p>Foods of Minimal Nutritional Value (USDA regulation 7 CFR 210 and 220) will not be available anytime during the school day.</p>	
Faculty Lounges	Faculty is encouraged to set the example for students. Students are not likely to believe that nutrition policies are beneficial if they see faculty consuming foods and beverages that do not align with the school policy.	Faculty is encouraged to set the example for students. Students are not likely to believe that nutrition policies are beneficial if they see faculty consuming foods and beverages that do not align with the school policy.	Faculty is encouraged to set the example for students. Students are not likely to believe that nutrition policies are beneficial if they see faculty consuming foods and beverages that do not align with the school policy.

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Other	Student Input-Students will be an active part of menu planning through regularly scheduled meetings and taste testing.	<p>Vegetarian Options-Students will be surveyed yearly for their interest in vegetarian entrees as part of the reimbursable meal or ala carte offerings. If interest is indicated, efforts should be made to include appealing vegetarian choices.</p> <p>Student Input-Students will be an active part of menu planning in conjunction with the director of food services.</p>	<p>Vegetarian Options-Students will be surveyed yearly for their interest in vegetarian entrees as part of the reimbursable meal or ala carte offerings. If interest is indicated, efforts should be made to include appealing vegetarian choices.</p> <p>Student Input-Students will be an active part of menu planning in conjunction with the director of food services.</p>

Nutrition Standards for Competitive Foods in Pennsylvania Schools

Table 1- Whole Grains

<p>A whole grain food is one labeled with the whole grain as first ingredient. The Food and Drug Administration requires foods that bear the “whole grain health claim” to contain 51% or more whole grain ingredients by weight per reference amount and be low in fat. Whole grains will usually contain at least 2 grams of fiber per serving. Examples of whole grain terms are: “cracked,” “crushed,” “whole,” “entire,” or “groats.” Examples of whole grain ingredients are:</p>	
Whole/entire wheat flour	Whole grain barley (hulled or lightly pearled)
Whole oats/oatmeal	Wild rice
Cracked/crushed wheat	Buckwheat
Graham flour	Wheat berries (whole wheat kernels)
Old fashioned oatmeal	Triticale
Quick cooking oats	Bulgur
Cornmeal	Millet
Whole grain corn	Quinoa
Popcorn	Sorghum
Brown rice	Spelt
Whole rye	
<p>Generally, if the first ingredient is “fortified” or “enriched,” it is probably not a whole grain. These items are generally <u>not</u> whole grains:</p>	
Unbleached flour	Organic, unbleached flour
Wheat flour	Enriched flour
Semolina	Degerminated (cornmeal)
Durum wheat	Multigrain (may describe several whole grains or several refined grains)

Sources include the USDA Food Buying Guide for Child Nutrition Programs, Dietary Guidelines for Americans 2005, Whole Grains Council.

Table 2-Fried Foods

Fried Foods: Foods that are cooked by total immersion into hot oil or other fat, commonly referred to as “deep fat frying.” This definition does not include foods that are stir fried or sautéed, but does include foods that have been pre-fried, flash fried, or deep-fat fried.

Table 3-Added Sugar

Brown Sugar	Invert sugar
Corn sweetener	Lactose*
Corn syrup	Maltose*
Dextrose	Malt syrup
Fructose*	Molasses
Fruit juice concentrate	Raw sugar
Glucose*	Sucrose
High fructose corn syrup	Sugar
Honey	Syrup
*Naturally occurring. Will not show up on food ingredient list unless added. Will be included as “sugars” listed on the food label.	

Table 4-Trans Fatty Acids (Trans Fats)

Trans fats: Occurs in food when manufacturers use hydrogenation, a process in which hydrogen is added to vegetable oil to turn the oil into a more solid (saturated) fat. Sources of trans fatty acids include hydrogenated/partially hydrogenated vegetable oils that are used to make shortening and commercially prepared baked goods, snack foods, fried foods, and margarine. Trans fatty acids are present in foods that come from ruminant animals (e.g., cattle and sheep). Such foods include dairy products, beef and lamb. Federal labeling of trans fats on all food products is required by January 1, 2006.

Nutrition Standards for Competitive Foods in Pennsylvania Schools

Table 5-Formulas

% Total fat: 1. Multiply grams of total fat per serving times 9 2. Divide by calories per serving 3. Multiply times 100
% Saturated fat: 1. Multiply grams of saturated fat per serving times 9 2. Divide by calories per serving 3. Multiply times 100
% Sugar by weight: 1. Divide grams of sugar per serving by gram weight for the serving size 2. Multiply times 100

Table 6

A-Artificial Sweeteners

Aspartame (brand names: Nutrasweet, Equal)	Acesulfame-K or Acesulfame potassium or ACK (brand names: Sunett and Sweet One)
Neotame	Saccharin (brand names: Sweet’N Low, Sweet Twin, and Necta Sweet, Sugar Twin)
Sucralose (brand name: Splenda)	

B-Sugar Alcohols (Polyols) and Other Sugar Substitutes

Erythritol*	Hydrogenated Starch Hydrolysates (HSH)* (polyglycitol, polyglucitol)
Isomalt*	Lactitol*
Maltitol*	Maltitol Syrup*
Mannitol*	Sorbitol*
Sugar Alcohol	Xylitol*
D-tagatose (novel sugar)	Trehalose (novel sugar)

*May also be listed on label as “sugar alcohol”

Note:

The Institute of Medicine (Nutrition Standards for Foods in Schools, 2007) classifies the artificial sweeteners above (aspartame, sucralose, acesulfame K, neotame, saccharin) and sugar alcohols as “Non Nutritive Sweeteners”.

The American Dietetics Association (Position of the American Dietetic Association: Use of Nutritive and Non Nutritive Sweeteners, 2004) classifies sugar alcohols as nutritive sweeteners that supply an average of 2 calories per gram because they are incompletely absorbed. However, foods containing sugar alcohols can be labeled as “sugar free” because they replace sugar sweeteners.

ATTACHMENT G



**SCHOOL
NUTRITION
ASSOCIATION**



National Nutrition Standards Recommendations

As of December 8, 2008



School Nutrition Association National Standards Guiding Principles

For School Breakfast and Lunch, Summer Feeding Programs, After School Snack Programs, and Other Items Sold / Served on the School Campus

General

1. National nutrient standards will reflect what is best for children's present and future health.
2. Schools will offer and promote foods and beverages consistent with *Dietary Guidelines for Americans 2005 (DGAs)* and *Dietary Reference Intakes (DRIs)*.
3. Foods and beverages available at school will contribute to teaching children lifelong healthy eating habits. This principle will be accomplished in partnership with school foodservice professionals, teachers, parents, and the broader community.
4. Federally reimbursable meals and snacks will be the primary source of foods and beverages offered at school.
5. Current and future implementation of these standards will require a collaborative effort with all stakeholders.
6. Compliance with Federal pre-emptive standards will require clear policies including enforcement, technical and financial support, and increased reimbursements.
7. Federal standards will pre-empt state and local standards for all foods and beverages sold/served during the school day throughout the campus.

School Breakfast and Lunch, Summer Feeding Programs, After School Snack Programs

1. Standards for reimbursable meals and reimbursable snacks will promote the consumption of a variety of foods and beverages from all food groups.
2. Nutrient content of foods and beverages will be averaged over a week, rather than nutrient profiling of an individual day or single food or beverage product.
3. SNA endorses all currently approved menu planning systems, including offer versus serve.
4. These recommendations are consistent with current Dietary Reference Intakes (DRIs), 1/3 for lunch and 1/4 for breakfast for the following dietary elements: calories, protein, vitamin A, vitamin C, calcium, and iron.
5. Meal pattern requirements should be averaged over a five day school week.
6. Calories and nutrients may need to be adjusted based on age and energy needs, including those for Pre K-Grade 3.
7. These recommendations are consistent with current Dietary Guidelines for Americans (DGAs) for fat, saturated fat, sodium, and fiber.
8. **SNA recommends that meeting these nutrient standards will be phased in over time.**



Items Sold / Served on the School Campus Outside of Reimbursable Meals

1. Foods and beverages sold/served outside reimbursable CNPs will complement, rather than compete with reimbursable meals and snacks, in order to support the DGAs.
2. Local districts should develop standards for classroom parties and celebrations.
3. A state or local wellness policy/initiatives may be more restrictive in the items sold/served, but may not alter the nutrition standards of items.
4. Authority needs to be given to the USDA for periodic review and updating based on nutrition science and the healthy status of children.



**School Nutrition Association
National Nutrition Standards
Meal Pattern Recommendations for School Breakfast and Lunch,
Summer Feeding Programs and After School Snack Programs**

SNA recommends the following standards for foods and beverages served/sold through the Child Nutrition Programs - School Breakfast and Lunch, Summer Feeding Programs, and After School Snack Programs. These standards are based on the DGAs 2005 and the USDA HealthierUS School Challenge Guidelines 2006.

SNA recommends the following standards for all reimbursable meals:

- | | |
|-----------------|---|
| ▪ Calories | Ranges based on DRIs |
| ▪ Fat | 25-35% of calories over week |
| ▪ Saturated Fat | Less than or equal to 10% of calories over week |
| ▪ Trans fat | Zero trans fat ($\leq .5$ grams) |

SNA recommends the following targets as total quantities for reimbursable meals throughout the school day.

- | | |
|-------------------------|--|
| ▪ Fiber | 14-21 grams throughout the school day |
| ▪ Sodium | 1,340 – 1,400 milligrams total throughout the school day |
| ▪ Fruits and vegetables | need to increase over time to meet DGA's. |

SNA recommends the following additional standards for School Nutrition Programs:

- For food-based menu planning systems, continue to offer a minimum of five components for lunch, four components for breakfast, and two components for afterschool snacks.
- Sodium: Salt shakers and packets shall not be available.
- Sugar: Sugar packets shall not be available.
- Legumes: Must be offered two times per week as either a meat/meat alternate and/or vegetable component.
- Extra fruits and vegetable servings are contingent on additional reimbursements.
- Schools need to begin working towards recommended targets so they reach those goals at implementation date.

Meal Pattern Recommendations

Lunch

	Minimum Requirement	Estimated Amount	Rationale
Meat/Meat Alternate	<ul style="list-style-type: none"> ▪ Offer lower fat options at least four days per week (defined as an item with less than 40% of calories from fat) ▪ Maintain current crediting for alternate protein products 	1-2 oz. daily	Range of ounces allows for flexibility
Grains/Breads	<ul style="list-style-type: none"> ▪ One half of grain servings should be whole grain choices. ▪ The HealthierUS School Challenge defines a whole grain product is a food/menu item where the primary grain ingredient is a whole grain. (Examples of common whole grains can be found in Table 7 of the 2005 DGAs; also pages 6 and 7 of the HealthierUS School Challenge) <p><i>Difficulty obtaining these products may require a phased approach to implementation.</i></p>	10-14 servings per week	DGAs recommend one-half of grains/breads from whole grain sources.
Fruits	<ul style="list-style-type: none"> ▪ Three different fruits must be offered each week to ensure variety ▪ Only 100% juice, no added sugar, may be offered ▪ If only one fruit choice is offered per day, juice may only be offered two times per week as the fruit choice ▪ Three servings of fresh fruits and/or raw vegetables shall be offered per week 	½ cup total fruit combination daily	<p>Rounded up estimated amount to phase in daily recommended need (DGAs) and current consumption patterns</p> <p>Rationale for fresh fruits and vegetables – USDA HealthierUS Challenge</p>
Vegetables	<ul style="list-style-type: none"> ▪ Three different vegetables must be offered each week to ensure variety ▪ Two servings of dark green vegetables per week ▪ One serving orange/deep yellow vegetables per week ▪ Only 100% juice, no added sugar, may be offered 	½ cup total vegetable combination daily	<p>Rounded up estimated amount to meet daily recommended need (DGAs) and current consumption patterns</p> <p>Rationale for fresh fruits and vegetables – USDA HealthierUS Challenge</p>

	<ul style="list-style-type: none"> Three servings of raw vegetables and/or fresh fruits shall be offered per week 		
Milk	<ul style="list-style-type: none"> Not to exceed 1% milk fat for all milk offered Not to exceed 28 grams of sugar per 8 oz. serving 	8 oz. daily	Small amounts of sugars added to nutrient-dense foods, such as low fat and fat-free milk products, may increase intake of such foods by enhancing the palatability of these products - DGAs.

Breakfast

	Minimum Requirement	Estimated Amount	Rationale
Meat/Meat Alternate	<ul style="list-style-type: none"> Maintain the requirement for m/ma and grains/breads, allowing flexibility in combining the two components ½ oz minimum of m/ma to be considered a serving 	½ – 2 oz. daily	Adds flexibility to menu planning on alternate serving methods.
Grains/Breads	<ul style="list-style-type: none"> Maintain the requirement for grains/breads and m/ma, allowing flexibility in combining the two components Whole grain offered minimum 3 times per week. The Healthier US School Challenge defines a whole grain product is a food/menu item where the primary grain ingredient is a whole grain. (Examples of common whole grains can be found in Table 7 of the 2005 DGAs; also pages 6 and 7 of the HealthierUS School Challenge) 	1 – 2 servings daily	DGAs recommend one-half of grains/breads from whole grain sources.
Fruits / Vegetables	<ul style="list-style-type: none"> Offer a variety of choices over a week 	¾ cup total combination daily	Adds flexibility in choices
Milk	<ul style="list-style-type: none"> Not to exceed 1% milk fat for all milk offered Not to exceed 28 grams of sugar per 8 oz. serving 	8 oz. daily	Small amounts of sugars added to nutrient-dense foods, such as low fat and fat-free milk products, may increase intake of such foods by enhancing the palatability of these products - DGAs.

Afterschool Snacks

	Minimum Requirement	Estimated Amount	Rationale
Meat/Meat Alternate	<ul style="list-style-type: none"> ▪ Keep the same requirement for all components with flexibility to offer any two of the four components 	1 oz. daily	Adds flexibility in choices
Grains/Breads	<ul style="list-style-type: none"> ▪ Whole grain offered minimum 1 time per week. ▪ The HealthierUS School Challenge defines a whole grain product is a food/menu item where the primary grain ingredient is a whole grain. (Examples of common whole grains can be found in Table 7 of the 2005 DGAs; also pages 6 and 7 of the HealthierUS School Challenge) 	1 serving daily	DGAs recommend one-half of grains/breads from whole grain sources.
Fruits / Vegetables		¾ cup combination daily when averaged over the week	Adds flexibility in choices
Milk	<ul style="list-style-type: none"> ▪ Not to exceed 1% milk fat for all milk offered ▪ Not to exceed 28 grams of sugar per 8 oz. serving 	8 oz. daily	Small amounts of sugars added to nutrient-dense foods, such as low fat and fat-free milk products, may increase intake of such foods by enhancing the palatability of these products - DGAs.



School Nutrition Association National Nutrition Standards

Recommendations for Items Sold / Served on the School Campus Outside of Reimbursable Meals

SNA recommends the following standards for foods and beverages served/sold outside reimbursable meals. The Institute of Medicine Nutrition Standards for Food in Schools and the Alliance for a Healthier Generation Competitive Foods and Beverage Guidelines were used as resources in developing these standards.

Tier 1 (All Students)

Tier 1 foods are fruits, vegetables, whole grains, and related combination products and low-fat and fat-free dairy that are limited to 200 calories or less per single serve portion, and:

- No more than 35 percent of total calories from fat
- Less than or equal to 10 percent of total calories from saturated fats
- Zero trans fat ($\leq .5$ grams)
- 35 percent or less of calories from total sugars
- Sodium content of 230 mg or less

Due to nutrient density, nuts (1 oz.), seeds (1 oz.), cheese (1 oz.), are exempt from fat, saturated fat standards. Must be served in 1 oz. serving size only.

Any entrée that is on the menu cycle as a part of a reimbursable meal (same specification/recipe/serving size) may be served / sold outside reimbursable meal in single serving only.

Tier 1 beverages:

- Water without flavoring, additives, carbonation, or added sugar
- Low-fat and fat-free milk (up to 8 oz. portion)
 - Lactose-free and soy beverages are included;
 - Not to exceed 170 calories per 8oz. serving
- 100 percent juice or 100% juice/water blends, with no added sugar (up to 10 oz. portion)
- Caffeine-free, with the exception of trace amounts of naturally occurring caffeine substances.



Tier 2 (Optional for Middle and High Schools Students only):

Tier 2 foods are limited to 200 calories or less per single serve portion:

- No more than 35 percent of total calories from fat
- Less than or equal to 10 percent of total calories from saturated fats
- Zero trans fat ($\leq .5$ grams)
- 35 percent or less of calories from total sugars
- Sodium content of 230 mg or less

Due to nutrient density, nuts (1 oz.), seeds (1 oz.), cheese (1 oz.), are exempt from fat, saturated fat standards. Must be served in 1 oz. serving size only.

Any entrée that is on the menu cycle as a part of a reimbursable meal (same specification/recipe/serving size) may be served / sold outside reimbursable meal in single serving only.

Tier 2 beverages are:

- Non-caffeinated, non-fortified beverages with less than 5 calories per portion as packaged (with or without nonnutritive sweeteners, carbonation, or flavoring) up to 20 oz. portion size
- Low-fat and fat-free milk with no more the 255 calories per 12 oz. portion size
- 100% juice or 100% juice/water blends with carbonation up to 12 oz.

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ATTACHMENT H

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (MOU) sets forth the agreement among

- The Alliance for a Healthier Generation;
- The American Heart Association;
- The William J. Clinton Foundation;
- The American Beverage Association;
- Cadbury Schweppes Americas Beverages, a subsidiary of Cadbury Schweppes plc;
- The Coca-Cola Company; and
- PepsiCo, Inc.

regarding a new school beverage policy.

Overview

The Alliance for a Healthier Generation ("Alliance"), a joint initiative of the American Heart Association and the William J. Clinton Foundation, under the leadership of President William J. Clinton and Governor Mike Huckabee, has joined with representatives of the American Beverage Association (ABA) and Cadbury Schweppes Americas Beverages, a subsidiary of Cadbury Schweppes plc; The Coca-Cola Company; and PepsiCo, Inc. (the three signatory companies) to create a new school beverage policy in the United States that will supersede current policy.

Fifty-four million children attend nearly 123,000 schools nationwide. Influencing and helping school districts and schools to provide healthy environments is one of the most efficient and effective ways of shaping the health, education and well-being of America's children. The purpose of this new policy is to accelerate the shift to lower-calorie and nutritious beverages that children consume during the regular and extended school day. This new policy shifts the focus to calories and the educational environment in which those calories are consumed.

The ABA and the three signatory companies will make diligent efforts to encourage their bottlers to adopt this policy as soon as possible for beverage sales to school children through vending machines, a la carte lines, and school stores, in full compliance with the law and their existing contract obligations. Moreover, the Alliance, the ABA and these companies will also make diligent efforts to encourage other members of the beverage industry to adopt this policy and to sell to schools only the product mix it outlines.

School Beverages

Elementary School

- Water
- ≤8 oz servings of milk and juice
 - Fat free or low fat milk and nutritionally equivalent (per USDA) milk alternatives
 - Fat free or low fat nutritionally equivalent flavored milk with ≤150 cal/8 oz

- 100% juice with no added sweeteners, ≤ 120 cal/8 oz & $\geq 10\%$ DV for ≥ 3 micronutrients

Middle School

- Same as elementary school with the following exceptions: juice and milk that meet the elementary school criteria may be available in 10 oz servings.
- As a practical matter, if middle school and high school students have common access to areas where beverages are sold on a common campus or in common buildings, then the school community has the option to adopt the high school standard.

High School

- Water
- No or low calorie beverages with ≤ 10 cal/8 oz (e.g., diet sodas, unsweetened or diet teas, low calorie sports drinks, fitness waters, flavored waters, seltzers)
- ≤ 12 oz servings of milk, light juice, juice and sports drinks
 - Fat free or low fat milk and nutritionally equivalent (per USDA) milk alternatives
 - Fat free or low fat nutritionally equivalent flavored milk with ≤ 150 cal/8 oz
 - 100% juice with no added sweeteners, ≤ 120 cal/8 oz, and $\geq 10\%$ DV for ≥ 3 micronutrients
 - Light juices and sports drinks with ≤ 66 cal/8 oz
- $\geq 50\%$ of beverages are water and no or low calorie options (≤ 10 cal/8oz)

Time of Day

This school beverage policy applies to beverages sold on school grounds during the regular and extended school day when events are primarily under the control of the school or third parties on behalf of the school. The extended school day can be defined as the time before or after the official school day that includes activities such as clubs, yearbook, band and choir practice, student government, drama, and childcare / latchkey programs.

This beverage policy does not apply to School-Related Events where parents and other adults are a significant part of an audience or are selling beverages as boosters during intermission, as well as immediately before or after such school-related events. Examples of these events include interscholastic sporting events, school plays, and band concerts.

Implementation Goals

The three signatory companies will make diligent efforts with their bottlers to ensure that only beverages described in this policy will be included in all future school contracts.

In order to accelerate migration to lower-calorie and nutritious beverages in schools, the Alliance, as well as the ABA and three signatory companies working with their bottlers will work with schools and school districts in the spirit of mutual financial fairness to amend the terms of existing contracts to change the product mix described therein to include only the beverages outlined in this policy.

We recognize that some sales of beverages to schools are currently made by independent food and beverage distributors and contract operators in response to tenders issued by school districts. We also recognize some beverages are purchased by schools from retail locations for sale through a la carte lines and school stores. The Alliance, the ABA, and the three signatory companies will make diligent efforts to encourage independent food and beverage distributors and contract operators to adopt this policy within three years. Together we will also seek to

encourage those organizations whose members comprise the individuals in school food service who develop RFPs to adopt and promote this policy to its members within 1 year.

It is the goal of the parties to achieve implementation of this policy for 75% of schools under contract with bottlers prior to the beginning of the 2008-2009 school year. The parties will strive to achieve implementation of the policy for all schools prior to the beginning of the 2009-2010 school year.¹

Reporting

Beginning in August 2007, and annually every year thereafter, the signatories to this MOU will support an annual analysis that will disclose the impact and status of this policy. This information will be made public by ABA on its website and/or by press release. The analysis will include the following:

1. Beverage sales to students in schools through all venues, similar to the Wescott study dated November 28, 2005. It shall include beverages children purchase at schools through vending machines, a la carte lines, school stores, or other venues. It would ideally distinguish between beverages supplied directly to schools by bottlers for consumption during the regular and extended school day, versus those supplied for School-Related Events or indirectly through other channels, such as food and beverage distributors and contract operators.
2. For contracts executed after signing this MOU, the percent of then valid contracts that comply with this policy on the following basis:
 1. Percent of school district contracts.
 2. Percent of elementary school contracts.
 3. Percent of middle school contracts. Companies will list middle schools that follow the high school standard with a valid justification for their exception.
 4. Percent of high school contracts that comply with this policy.
3. For contracts executed before signing this MOU, the percent of then valid contracts that have been amended to comply with this policy.
 1. Percent of school district contracts.
 2. Percent of elementary school contracts.
 3. Percent of middle school contracts. Companies will list middle schools that follow the high school standard with a valid justification for their exception.
 4. Percent of high school contracts that comply with this policy.

Healthy Schools Program Standard and Other Standards

This policy will represent the only beverage standard used for school recognition that is part of the Alliance for a Healthier Generation's Healthy Schools Program.

We do, however, recognize that some state legislation, district policy, or other standards may be different than this policy. This policy does not undo those efforts or usurp the authority of

¹ Provided schools and school districts are willing to amend school contracts in existence at the time of this MOU

parents, educators, and their elected representatives. It is not the intent of this policy to undermine any local initiatives to set standards or change any laws.

Communications

All parties will actively support the new policy and their commitment to the standards of the policy, including the beverages provided in schools, on an ongoing basis.

All use of names or representations in association with this agreement of President Clinton, Governor Huckabee, the American Heart Association, and the Alliance for a Healthier Generation must be approved in writing in advance by the Clinton Foundation, Governor Huckabee, the American Heart Association, and the Alliance for a Healthier Generation respectively. This agreement does not permit the usage of the American Heart Association trademarks or service marks without prior written permission.

All use of names and representations with this agreement of Cadbury Schweppes Americas Beverages, The Coca-Cola Company, PepsiCo, as well as their products, and the American Beverage Association must be approved in writing in advance by the American Beverage Association on behalf of these companies. This agreement does not permit the usage of the Cadbury Schweppes, Coca-Cola or PepsiCo trademarks or service marks without prior written permission.

Organizations who are signatories to this agreement will develop and jointly approve standard language and terms of use for each to use to represent their support of this policy.

Changes to Policy

All parties recognize that compelling new scientific evidence may arise at any time that could cause us to revisit this policy.

[Signatures of Authorized Representatives of Parties to this MOU appear on next page.]

ACCEPTED

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By: _____
Printed Name: Robert S. Harrison
Title: Executive Director
Date: May 3, 2006

American Heart Association
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By: _____
Printed Name: Robert H. Eckel, MD
Title: President
Date: May 3, 2006

Clinton Foundation
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By: _____
Printed Name: Ira C. Magaziner
Title: Chairman, Clinton Foundation Policy
Board
Date: May 3, 2006

American Beverage Association
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By: _____
Printed Name: Susan K. Neely
Title: President & CEO
Date: May 3, 2006

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By: _____
Printed Name: Gilbert Cassagne
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Date: May 3, 2006

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By: _____
Printed Name: Donald Knauss
Title: President, Coca-Cola North America
Date: May 3, 2006

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By: _____
Printed Name: Dawn Hudson
Title: President & CEO, Pepsi-Cola North
America
Date: May 3, 2006

ATTACHMENT I

REPORT BRIEF • APRIL 2007

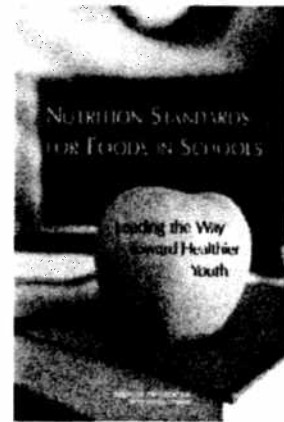
NUTRITION STANDARDS FOR FOODS IN SCHOOLS: LEADING THE WAY TOWARD HEALTHIER YOUTH

Research has shown that the school environment has a vital role in shaping children's health behaviors. The rise in obesity over the past 2-3 decades has been accompanied by an increase in the number of alternative food options available on school campuses. These "competitive foods" that are obtained from a variety of sources, including à la carte service in the school cafeteria, school stores and snack bars, and vending machines, are vying with the traditional breakfast and lunch offered through federally reimbursable school nutrition programs. Children spend the majority of their day at school, often staying for after-school activities; the foods and beverages available during and after school can contribute a number of calories to their total daily consumption.

Children in the United States are becoming more overweight and obese, putting them at risk for serious health concerns such as diabetes, cardiovascular disease, and elevated cholesterol and blood pressure levels. In addition to the risk of obesity-related health concerns, poor food choices could lead to other health concerns, like osteoporosis from inadequate calcium intake.

In response to growing concerns over obesity, national attention has focused on the need to establish school nutrition standards and limit access to competitive foods. As a result, over the past few years, school nutrition policy initiatives have been put into place at federal, state, and local levels. Two important federal initiatives have enhanced school health-related policy efforts. First, in 1994, the Centers for Disease Control (CDC) developed the Coordinated School Health Program, comprised of eight interactive components to improve students' health. The second initiative was the Child Nutrition and WIC Reauthorization Act, passed in 2004, which required that local education agencies develop a wellness policy for schools to address the problem of childhood obesity by 2006. However, responses of school districts to meeting wellness policy requirements have not been consistent.

Thus, to augment local wellness policies, Congress directed the CDC to undertake a study with the Institute of Medicine (IOM) to review and make recommendations about appropriate nutritional standards for the availability, sale, content and consumption of foods at school, with attention on competitive foods. The ensuing report, *Nutrition Standards for Healthy Schools: Leading the Way Toward Healthier Youth*, concluded that federally-reimbursable school nutrition programs should be the main source of nutrition at school, and opportunities for competitive foods should be limited. However, if competitive foods are available, they should consist of nutritious fruits, vegetables, whole grains, and nonfat or low-fat milk and dairy products, consistent with



Children spend the majority of their day at school, often staying for after-school activities; the foods and beverages available during and after school can contribute a number of calories to their total daily consumption.



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the 2005 Dietary Guidelines for Americans (DGA), to help children and adolescents develop healthful lifelong eating patterns.

GUIDING PRINCIPLES FOR EATING HEALTHY AT SCHOOL

The IOM report lays out a set of guiding principles to support the creation of healthful eating environments for U.S. school children, as shown in Box 1.

...if competitive foods are available, they should consist of nutritious fruits, vegetables, whole grains, and nonfat or low-fat milk and dairy products, consistent with the 2005 Dietary Guidelines for Americans (DGA), to help children and adolescents develop healthful lifelong eating patterns.

Box 1. Guiding Principles

The committee recognizes that:

1. The present and future health and well-being of school-age children are profoundly affected by dietary intake and the maintenance of a healthy weight.
2. Schools contribute to current and life-long health and dietary patterns and are uniquely positioned to model and reinforce healthful eating behaviors in partnership with parents, teachers, and the broader community.
3. Because all foods and beverages available on the school campus represent significant caloric intake, they should be designed to meet nutritional standards.
4. Foods and beverages have health effects beyond those related to vitamins, minerals, and other known individual components.
5. Implementation of nutrition standards for foods and beverages offered in schools will likely require clear policies; technical and financial support; a monitoring, enforcement, and evaluation program; and new food and beverage products.

The committee intends that:

6. The federally reimbursable school nutrition programs will be the primary source of foods and beverages offered at school.
7. All foods and beverages offered on the school campus will contribute to an overall healthful eating environment.
8. Nutrition standards will be established for foods and beverages offered outside the federally reimbursable school nutrition programs.
9. The recommended nutrition standards will be based on the Dietary Guidelines for Americans, with consideration given to other relevant science-based resources.
10. The nutrition standards will apply to foods and beverages offered to all school-age children (generally ages 4 through 18 years) with consideration given to the developmental differences between children in elementary, middle, and high schools.

ORGANIZING FOODS AND BEVERAGES INTO A TIER SYSTEM

The authoring committee systemically organized foods and beverages offered separately from federally-reimbursable school nutrition programs into two tiers according to their consistency with the DGA, as shown in Table 1.

Tier 1 foods and beverages provide at least one serving of fruit, vegetables and/or whole grains, or nonfat/low-fat dairy products and are foods to be encouraged. Tier 2 foods and beverages fall short of meeting Tier 1 criteria, but they do not fall outside the DGA recommendations, and so are allowed, but only in specific circumstances. The committee recommends that plain, potable water is available throughout the school day at no cost to students.

TABLE 1. Foods and Beverages That Meet Tier 1 and Tier 2 Standards

Foods	Beverages
Tier 1 for All Students	
<p>Tier 1 foods are fruits, vegetables, whole grains, and related combination products* and nonfat and low-fat dairy that are limited to 200 calories or less per portion as packaged and:</p> <ul style="list-style-type: none"> • No more than 35 percent of total calories from fat • Less than 10 percent of total calories from saturated fats • Zero trans fat (less than or equal to 0.5 g per serving) • 35 percent or less of calories from total sugars, except for yogurt with no more than 30 g of total sugars, per 8-oz. portion as packaged • Sodium content of 200 mg or less per portion as packaged <p>À la carte entrée items meet fat and sugar limits as listed above and:**</p> <ul style="list-style-type: none"> o Are National School Lunch Program (NSLP) menu items o Have a sodium content of 480 mg or less 	<p>Tier 1 beverages are:</p> <ul style="list-style-type: none"> • Water without flavoring, additives, or carbonation. • Low-fat* and nonfat milk (in 8 oz. portions): <ul style="list-style-type: none"> o Lactose-free and soy beverages are included o Flavored milk with no more than 22 g of total sugars per 8-oz. portion • 100-percent fruit juice in 4-oz. portion as packaged for elementary/middle school and 8 oz. (two portions) for high school. • Caffeine-free, with the exception of trace amounts of naturally occurring caffeine substances.

*Combination products must contain a total of one or more servings as packaged of fruit, vegetables, or whole grain products per portion.

**200-calorie limit does not apply; items cannot exceed calorie content of comparable NSLP entrée items.

*1-percent milk fat

Tier 1 foods and beverages provide at least one serving of fruit, vegetables and/or whole grains, or non-fat/low-fat dairy products and are foods to be encouraged.

Tier 2 for High School Students After School

Tier 2 snack foods are those that do not exceed 200 calories per portion as packaged and:

- No more than 35 percent of total calories from fat
- Less than 10 percent of total calories from saturated fats
- Zero trans fat (less than or equal to 0.5 g per portion)
- 35 percent or less of calories from total sugars
- Sodium content of 200 mg or less per portion as packaged.

Tier 2 beverages are:

- Non-caffeinated, non-fortified beverages with less than 5 calories per portion as packaged (with or without nonnutritive sweeteners, carbonation, or flavoring).

Items containing significant amounts of added sugars typically provide "empty calories"—contributing calories without substantial amounts of other nutrients—thus, limiting foods high in added sugars is recommended.

TRIMMING THE EXCESS FROM SCHOOL FOODS AND BEVERAGES

Dietary Fats

Americans consume too much saturated fat, which is associated with increased risk for cardiovascular disease. And like saturated fats, trans fats found in hydrogenated oils increase low-density lipoprotein (LDL) cholesterol, which can further increase risk for heart disease. Trans fats also decrease high-density lipoprotein (HDL) cholesterol, or "good" cholesterol, which protects against heart disease. The committee recommends that snacks, food, and beverages meet the following criteria for dietary fat per portion as packaged: no more than 35 percent of total calories from fat, less than 10 percent of total calories from saturated fats, and trans fat-free.

Added Sugars

Items containing significant amounts of added sugars typically provide "empty calories"—contributing calories without substantial amounts of other nutrients—thus, limiting foods high in added sugars is recommended. The committee believes that limiting sugars to no more than 35% of the item's calories (for nondairy products) is achievable and will contribute to efforts to improve children's eating habits. Dairy products are excepted because they provide calcium for bone health. To avoid eliminating popular dairy products due to the sugars content, the committee made an exception that flavored nonfat and low-fat milk can contain up to 22 grams of total sugars per 8 oz portion and flavored nonfat and low-fat yogurt can contain up to 30 grams of total sugars per 8 oz portion. These standards will maintain product palatability while still reducing intake of added sugars.

Nonnutritive Sweeteners and Soda

In regards to nonnutritive sweeteners (e.g., sugar substitutes like aspartame and saccharin), the committee considered four important issues: safety, displacement of other foods and beverages that should be encouraged, effectiveness for weight control, and the role of choice and necessity. Given the limited amount of consistent evidence, the committee took a cautious approach in its recommendations for the use of nonnutritive sweeteners in schools.

There is some evidence that nonnutritive sweeteners in beverages specifically are an effective weight management tool; however, because they have been shown to dis-

place milk and 100% juice when they are chosen at mealtimes, these competitive beverages should be allowed only in high schools, and only after the school day has ended.

Regarding nonnutritive sweeteners in foods, the committee found a lack of evidence about the effectiveness of nonnutritive sweeteners in foods for weight management. Also, while available studies of the safety of nonnutritive sweeteners have given assurance that they can be marketed and consumed by the public, there are not any studies that have looked for potential effects when these substances are consumed over many years, starting in childhood or teen years. Therefore, the committee did not make recommendations regarding foods containing nonnutritive sweeteners.

Flavored, Carbonated, and Fortified Waters

Schools should make plain, unflavored water available for free throughout the school day, either in the form of bottled water or from water fountains. The committee recommends restricting carbonated water, fortified water, flavored water, and similar products because kids who drink these products may forgo healthier beverages like milk and juice. Also, they are not necessary for hydration purposes, and the growing variety of products increases the difficulty people have in making clear distinctions among them. In addition, the committee did not wish to encourage manufacturers to produce more beverages and foods with nonnutritive components aimed at children rather than products that provide fruits, vegetables, whole grains or healthy dairy.

Sports Drinks

Sports drinks contain significant amounts of sugar or other sweeteners and therefore exceed the standards to be considered Tier 1 or Tier 2 beverages. However, they do provide electrolytes, energy and hydration—all things that people involved in vigorous physical activity may need. The committee recommends that at the discretion of coaches they be available to students engaged in vigorous activity lasting an hour or more.

After-School Activities

After-school activities that are attended mainly by students represent an extension of the regular school day. So only Tier 1 products should be available during after-school activities involving elementary and middle school students. Tier 1 and Tier 2 items should be available to high school students engaged in activities on the school campus after school.

There are also many events that take place on school grounds and involve both students and adults or mainly adults. The committee recognizes that attempting to regulate items sold at such events may be impractical and even undesirable. But schools are encouraged to use foods and drinks that meet nutritional standards.

Fundraising Products

The committee recognizes that many school clubs and organizations have a tradition of selling candy and other foods and drinks for fundraisers. Fundraising is an important activity, but it can be done with healthy foods and drinks if not with other inedible products. Elementary, middle, and high schools should allow only Tier 1 products to be sold on campus for fundraising purposes. In addition to Tier 1 items,

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Marketing of foods and beverages in schools should be limited, as recommend in the 2005 IOM report, *Food Marketing to Children and Youth: Threat or Opportunity?*...

high schools could allow Tier 2 items after school to be used for on-campus fundraising as well. For evening and community activities that include adults, Tier 1 and 2 foods and beverages are encouraged.

Caffeine

The committee did not support the sale of caffeinated products to school-age children because of the potential for negative effects, including shakiness, headaches, and other symptoms of dependency and withdrawal that could disrupt their abilities to concentrate and learn. They recognize that some products that do not meet the minimal amount, such as chocolate milk, contain naturally occurring trace amounts of caffeine and those items are permissible.

Marketing Foods and Beverages at Schools

Competitive foods and beverages should be limited during the school day, and at after-school events and activities—especially those that are attended mainly by students as an extension of the school day. Marketing of foods and beverages in schools should be limited, as recommend in the 2005 IOM report, *Food Marketing to Children and Youth: Threat or Opportunity?*, and the following standards should be implemented:

- Locate Tier 2 food and beverage distribution in low student traffic areas and ensure that the exterior of vending machines does not depict commercial products or logos or suggest that consumption of vended items conveys a health or social benefit.
- Tier 1 snack items are allowed after school for student activities for elementary and middle schools. Tier 1 and 2 snacks are allowed after school for high school.
- For on-campus fundraising activities during the school day, Tier 1 foods and beverages only are allowed for elementary and middle schools; Tier 1 and 2 foods and beverages are allowed for high schools. For evening and community activities that include adults, Tier 1 and 2 foods and beverages are encouraged.

Implementation of Nutrition Standards in Schools

Appropriate policy-making bodies should ensure that recommendations are fully adopted by providing:

- Regulatory guidance to federal, state, and local authorities;
- Designated responsibility for overall coordination and oversight to federal, state, and local authorities; and
- Performance-based guidelines and technical and financial support to schools or school districts, as needed.

Appropriate federal agencies should engage with the food industry to:

- Establish a user-friendly identification system for Tier 1 and 2 snacks, foods, and beverages that meet the standards per portion as packaged; and
 - Provide specific guidance for whole-grain products and combination products that contain fruits, vegetables, and whole grains.
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CONCLUSION

The federally reimbursable school nutrition programs traditionally have been an important means for ensuring that students have daily access to fruits, vegetables, whole-grain-based products, and nonfat or low-fat dairy products during the school day.

The committee's view is that these programs should be the main source of nutrition provided at school. However, the committee also recognizes that there are an increasing number of opportunities for students to eat and drink, including à la carte services, vending machines, school stores, snack bars, concession stands, classroom or school celebrations, achievement rewards, after-school programs, and other venues.

Thus, schools are encouraged to limit such additional opportunities for students to eat and drink, but when they do arise in school, they should be used to encourage greater daily consumption of fruits, vegetables, whole grains, and nonfat or low-fat dairy products. The recommendations in this report are intended to ensure that offerings in these venues are consistent with the DGA and, in particular, to help children and adolescents meet the guidelines for consumption of fruits, vegetables, whole grains, and nonfat or low-fat dairy products.

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FOR MORE INFORMATION...

Copies of *Nutrition Standards for Foods in Schools: Steps Toward Healthier Youth in America* are available from the National Academies Press, 500 Fifth Street, N.W., Lockbox 285, Washington, DC 20055; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area); Internet, <http://www.nap.edu>. The full text of this report is available at <http://www.nap.edu>.

This study was supported by funds from the U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the organizations or agencies that provided support for the project.

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