

## Foods in Schools: Children With Diabetes Can Make Wise Meal Choices

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Complaints about the foods served at schools are often heard from students, parents, and school staff.<sup>1,2</sup> The impression one might receive is that there are no healthful foods available in schools. In fact, parents of children with diabetes might believe that their only choice is to send lunch from home for their child to ensure that appropriate foods are consumed. One of the problems may be that parents do not understand today's school food environment. A better understanding of school meal options will assist parents and children with diabetes in making wise meal choices.

### The U.S. School Meals Program

Students in public schools in the United States can choose from a wide array of foods in schools. The U.S. Department of Agriculture (USDA) oversees the National School Breakfast and Lunch Programs, which provide breakfasts and lunches in 85 and 99% of public schools, respectively.<sup>3</sup> The original National School Lunch Program (NSLP) was initiated in 1946 as a safety net to provide healthful meals for students in need. Qualifying students can receive free or reduced-price meals, depending on family income, whereas meals are available for a fee to all students and staff. Applications for free and reduced-price meals may be completed at any time during the school year. In 2007, ~ 30 million schoolchildren ate school lunch meals each day; ~ 10 million children ate a school breakfast.<sup>3</sup>

USDA regulations require that the meal programs comply with the 1995 Dietary Guidelines. School lunches and breakfasts must provide at least

one-third and one-fourth, respectively, of the 1989 Recommended Dietary Allowances<sup>4-6</sup> for selected nutrients, averaged over five consecutive school days (Table 1). There are also regulations for the maximum amounts of total fat and saturated fat and calorie levels. NSLP meals usually consist of an entree, two servings of fruits or vegetables, a grain product, and 8 oz of milk. Lower-fat milk varieties (2%, 1%, and nonfat) are available. School districts are encouraged to serve whole grains and to serve fresh fruit and vegetables in addition to canned and frozen products. Students only have to take a certain number of items for the meal to count as a reimbursable meal. Many school menus offer a choice of items in each category. For example, there might be two to four entrees and three to four fruit and vegetable choices for each lunch meal. Middle schools and high schools usually offer more daily selections than elementary schools. The variety of foods on these menus should provide ample opportunity for children with diabetes to make appropriate choices that meet their breakfast and lunch needs. Children can be encouraged to select lower-fat options and to check with the food service staff to see if vegetables can be served without sauces.

Schools may also have food available in other places, such as snack bars, a la carte lines, vending machines, and school stores, where students can purchase a variety of foods and beverages.<sup>7</sup> However, there are no federal rules for foods sold elsewhere in the school except for those of minimal nutritional value, such as soda.<sup>8</sup> This has become a big-

**Table 1. Required Nutrient Standards for Traditional School Lunch Meal Patterns**

Age/Grade Group:	Preschool	Grades K-3	Grades 4-12	Grades 7-12 Optional
Energy allowances (kcal)	517	633	785	825
Protein (g)	7	9	15	16
Calcium (mg)	267	267	370	400
Iron (mg)	3.3	3.3	4.2	4.5
Vitamin A (retinol equivalents [RE])	150	200	285	300
Vitamin C (mg)	14	15	17	18
Total fat	No more than 30% of total calories should come from fat, averaged over a week.			
Saturated fat	Less than 10% of total calories should come from saturated fat, averaged over a week.			

ger issue because of recent research showing that the school environment influences dietary behavior.<sup>9</sup> For example, in a middle school where students could buy foods at a snack bar, students consumed more sweetened beverages and french fries and fewer fruits and vegetables than when they were in elementary schools without snack bars.<sup>10,11</sup> In high schools where soda machines were turned off during lunch, students purchased fewer sodas compared to students in schools where these machines were on during lunch.<sup>12</sup> Menus that identify the foods and beverages available from these sources may not be available for children and parents to review.

In response to health concerns and to improve the school food environment, federal legislation mandated the establishment of school wellness policies in all districts that offer the NSLP by the fall of 2006.<sup>13</sup> Wellness policies, created by each district's school wellness committee, must address the foods available in the total school food environment, as well as the district's nutrition and physical education programs. In addition, each district must have a plan to

evaluate the components of its wellness policy. School food policies can make positive impacts on students' dietary behavior. After implementation of the Texas Public School Nutrition Policy,<sup>14</sup> middle school students consumed more low-fat milk, fruits, and vegetables, and less sweetened beverages, candy, chips, and dessert foods compared to consumption in school years before the policy.<sup>15</sup> Parents can call their school district to find out about the wellness policy for their schools and to volunteer to serve on the committee.

Additionally, school menus are usually organized in a 2- to 5-week cycle that is repeated throughout the school year. An example of a 2-week breakfast menu cycle is presented in Table 2. Students can choose one of three main breakfast entrees, along with 8 oz of milk and a serving of either juice or fruit. The sample lunch cycle menu in Table 3 shows the variety and categories of foods offered at lunch. In this district, four entrée items are available each day. One entrée item is different each day, there is one "special of the day," and two entrée items are served daily. Three vegetables are served, of which

the students can select two. Fresh or canned fruit is served daily, along with a hot whole-wheat roll and milk. Menus are often sent home to parents each month and should also be posted in the school and available on the school district's website.

**Eating at School: Carbohydrate Counting**

Children, adolescents, and caregivers are taught to manage diabetes with diet, exercise, self-monitoring of blood glucose, and often diabetes medications.<sup>16</sup> The most commonly prescribed meal-planning approach for youth with diabetes is carbohydrate counting. This approach involves teaching children (or their caregivers) how to identify the carbohydrate content of their food and to select the food items and amounts for each meal or snack that meet their individualized nutrition needs. For children or adolescents who require oral diabetes medication(s), insulin, or other types of injectable diabetes medications, the ability to count or quantify their carbohydrate intake can help them to achieve more optimal glycemic control.<sup>17</sup> In addition, overweight or obese youths with type 2 diabetes can use the carbohydrate counting meal-planning approach to help them budget or spread their carbohydrates throughout the day.

Meal plans for youths typically include three meals per day and two to three snacks. Children with diabetes should work with a registered dietitian (RD) or certified diabetes educator (CDE) to adjust caloric and carbohydrate needs during growth or periods of high activity (e.g., sports seasons). There is no one meal plan that is appropriate for all children with diabetes. Meal plans must grow with growing children or adolescents.

Many districts use computer-based nutrient analysis programs that provide the estimated nutrient content of menu items. More detailed information may also be found on the nutrition label of purchased foods. This information, including the carbohydrate content per serving of each menu item, is often available to parents, caregivers, children, and adolescents. If the nutritional analysis of foods and beverages is not available online, the school nurse

**Table 2. Sample 2-Week Breakfast Cycle Menu**

<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Cinnamon Roll OR Manager's Special Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Cinnamon Roll OR Breakfast Burger Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal OR Breakfast Pizza OR Omelet Taquito Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal OR Cinnamon Roll OR Sausage & Cheese Biscuit Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal OR 2 Poptarts OR Sausage Pancake Stick Fruit or Fruit Juice Choice of Milk
<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Egg Patty, Sausage OR French Toast Boat Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Cinnamon Roll OR Sausage Kolache Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Breakfast Burrito OR Waffles Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Cinnamon Roll OR Chicken Biscuit Fruit or Fruit Juice Choice of Milk	<u>Entrée - Choose 1</u> Bowl of Cereal Toast OR Muffin and Yogurt OR Breakfast Combo Fruit or Fruit Juice Choice of Milk

**Table 3. Sample 2-Week Lunch Cycle Menu**

<u>Entrée - Choose 1</u> Spicy Drumsticks Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Chili Mac w/Cheese Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Steak Fingers Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Sausage Link Hoagie Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Egg Roll and Fried Rice Chicken Nuggets Chicken Fried Steak “Special of the Day”
<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Seasoned Carrots Fresh and Chilled Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Seasoned Carrots Fresh Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Seasoned Corn Fresh Fruit and Fruit Crisp Milk and Hot Roll	<u>Vegetables - Choose 2</u> Mac-n-Cheese Whipped Potatoes/ Gravy Garden Salad Fresh Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Oriental Vegetables Fresh and Chilled Fruit Milk and Hot Roll
<u>Entrée - Choose 1</u> Smothered Steak Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Spaghetti and Meat Sauce Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Spicy Tenders Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Oven Fried Chicken Chicken Nuggets Chicken Fried Steak “Special of the Day”	<u>Entrée - Choose 1</u> Crispy Fish Chicken Nuggets Chicken Fried Steak “Special of the Day”
<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Seasoned Carrots Fresh and Chilled Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Lettuce and Tomato Salad Fresh Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Vegetable Specialty Peas and Carrots Cake Fresh Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Mac-n-Cheese Whipped Potatoes/ Gravy Seasoned Green Beans Fresh Fruit Milk and Hot Roll	<u>Vegetables - Choose 2</u> Whipped Potatoes/ Gravy Seasoned Corn Fresh and Chilled Fruit Milk and Hot Roll

**Table 4. Examples of School Menu Item Estimated Carbohydrate Content\***

Item	Serving Size	Carbohydrate (g)
Chicken Sandwich, Spicy	1	40
Grilled Cheese, Homemade, Lunch	1	30
Hamburger	1	30
Sandwich, Turkey	1	26–28
Corndog	1	30
Pizza, Pan Crust, Cheese	1 slice	34
Fresh Apple (~ 4–4.5 oz)	1	~ 20
Fresh Orange (~ 4–4.5 oz)	1	~ 15
Fresh Banana (~ 6 oz)	1	~ 30–35
Beans, Green	3/8 cup	2–3
Beans, Pinto	3/8 cup	~ 12
Hot Roll, Wheat	1	18
Chocolate Ice Cream Cup	3 oz	13

\*Based on recipe and/or manufacturer information.

or school food service professional may be able to provide this information to families. Table 4 shows the carbohydrate content of some common school menu items. Caregivers may use these carbohydrate values to help their child or adolescent plan breakfast and lunch choices. Unfortunately, the nutritional analysis of the school menu is not always easily available. In these situations, youths with diabetes and their caregivers may need to work with their RD or CDE to identify appropriate menu choices by identifying the carbohydrate content of the specified menu items.

School cafeterias have standardized serving sizes for all menu items. For example, if mashed potatoes are served, the portion will be consistent, e.g., a 4-oz or ½-cup serving spoon. One serving of mashed potatoes would consistently contain ~ 15 grams of carbohydrate, or one carbohydrate choice (15 grams = one choice). In general, schools usually

purchase small- to medium-size fruit, and milk is usually served in 8-oz containers, generally counted as 15 grams of carbohydrate or one carbohydrate choice. Low-fat milk varieties must be available. Snack bar or a la carte items that are packaged will usually have a food label that can be used to evaluate the amount of carbohydrate present in a serving of a particular food. The information on portion sizes of the foods served in school should be readily available from each school district’s Child Nutrition Department.

School nurses and school food service professionals generally welcome communication with families. The school goal is to provide healthy food selections for all students. Armed with the knowledge of foods available at schools, parents, caregivers, and children with diabetes should be able to plan healthful menus. Children with diabetes can enjoy meals prepared at school, in the company of their peers.

### Acknowledgments

This work is a publication of the U.S. Department of Agriculture Agricultural Research Service Children’s Nutrition Research Center in the Department of Pediatrics at Baylor College of Medicine in Houston, Tex. This project has been funded in part by federal funds from the USDA/ARS under Cooperative Agreement No. 58-6250-6001. The contents of this publication do not necessarily reflect the views or policies of the USDA, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.

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