

Competitive Food Initiatives in Schools and Overweight in Children: A Review of the Evidence

*Sarah Fox, MD; Amy Meinen, RD, CD; Mary Pesik, RD, CD ; Matthew Landis, MS;
Patrick L. Remington, MD, MPH*

ABSTRACT

Background: Recent research has shown significant increases in the rates of obesity in US adults and children. Despite the widespread discussion about childhood overweight, relatively little discussion focuses on solutions.

Methods: We reviewed the literature on school programs and policies that address competitive foods—commonly called “junk” foods. These foods tend to be high in sugar or fat and provide minimal nutritive value.

Results: Sugar-sweetened beverages such as sodas contribute to weight gain and poor nutrition among students—the average student consumes 31 pounds of sugar in these drinks annually. The sale of competitive foods in schools often competes with the more nutritious school lunch programs. With minimal federal and state policies addressing the sale of competitive foods, individual school districts in Wisconsin and elsewhere have explored various alternatives to improve school nutrition. The evidence suggests that these policies can be effective and at the same time increase food sale revenue.

Conclusion: Communities may be able to improve childhood nutrition through school-based nutrition

programs and policies that address the sale of competitive foods.

INTRODUCTION

Considerable attention has been focused on the increasing rates of overweight and associated co-morbidities among children in Wisconsin. While the causes of overweight in children are multifactorial and complex, diet is 1 of the major contributors. From 1989 to 1996, the typical child’s average daily caloric intake in the United States increased by 80-230 calories per day.¹ The reasons for this increase include an increase in portion size, a shift from low energy density foods to high energy density foods, an increase in snacking, and, most notably, an increase in sugar-sweetened beverage consumption (e.g., soda, sweetened fruit drinks, energy drinks).²

Despite the widespread discussion about childhood overweight, relatively little discussion focuses on solutions. Health care professionals, who are potential key stakeholders, can become more effective by having an awareness of school programs and policies related to overweight. There are 2 aims in this paper: first, to review the potential contribution of school nutrition on increasing rates of overweight among children, and second, to outline school policies intended to improve diet and reduce the consumption of “competitive foods,” that is, those foods offered at school other than meals served through USDA’s school meal programs. These foods tend to be high in sugar or fat and provide minimal nutritive value.

CONSUMPTION OF SUGAR-SWEETENED BEVERAGES

Added sugar now accounts for 20% of total food energy in the average child’s diet; one third of this added sugar comes from sugar-sweetened beverages.³ Between 56% and 85% of children drink at least one 8-oz serving of sugar-sweetened beverage a day, and the average child

Doctor Fox is a first year resident in the University of Wisconsin (UW) Department of Family Medicine, Madison. This article was written while she was in her 4th year of medical school at UW-Madison. Ms Meinen and Ms Pesik are with the Nutrition and Physical Activity Program within the Bureau of Community Health Promotion at the Division of Public Health (DPH) in Madison, Wis. Mr Landis is a graduate student in the Department of Population Health Sciences at UW-Madison. Doctor Remington is a professor in the Department of Population Health Sciences at the UW Medical School and director of the UW Population Health Institute. Please address correspondence to: Patrick Remington, MD, MPH, UW Population Health Institute, 610 N Walnut St, Madison, WI 53726; phone 608.263.1745.

drinks 1.4 servings daily. Over 1 year, this average daily intake of sugar-sweetened beverages amounts to 31 lbs of sugar. Although these general statistics are striking, even more so are findings specific to adolescent males: over one third of male teenagers consume in excess of 3 soft drinks daily, the equivalent of 30 teaspoons of sugar per day.⁴

Research has shown that drinking sugar-sweetened beverages increases intake of total daily calories, as these beverages are consumed in addition to usual energy sources.⁵ In fact, despite the increase in total caloric intake between 1989 and 1996, there was a decrease in the percentage of those calories coming from fat, while the overall consumption of nutrients held steady. This is related to the increase in consumption of “empty calories,” such as those in sugar-sweetened beverages. Children who drink sugar-sweetened beverages take in 55 to 190 more calories daily than children who do not drink those beverages.^{3,5} For each additional serving of sugar-sweetened beverage consumed daily, the child’s risk of becoming overweight increases by 60%.⁶

The problem with sugar-sweetened beverages is not limited to calorie consumption. Research has shown a negative relationship between consumption of sweetened drinks and intake of protein, calcium, and vitamin A.^{7,8} Additionally, every 4.2-ounce increase in sugar-sweetened beverage consumption is accompanied by a 1-ounce decrease in milk consumption. This leads to an overall increase of 31 calories and a decrease in calcium of 34 mg.⁹ This decreased calcium intake can compromise bone formation during critical growth periods in childhood, with lifelong consequences.¹⁰ From 1994 to 1996, children drank twice as many sugar-sweetened beverages as milk. Nutritional consequences of sugar-sweetened beverages are a contributor to the current situation where only 30% of children consume the recommended daily servings of milk, and only 2% of children are meeting the USDA Food Pyramid Recommendations.

THE NATIONAL SCHOOL LUNCH PROGRAM

The goal of the National School Lunch Program is to provide nutritionally balanced lunches for students. There are 3 main tenets of the National School Lunch Program: first, to offer lunches that provide one third of the recommended dietary allowance (RDA) for protein, vitamin A, vitamin C, calcium, iron, and calories. Second, total fat and saturated fat should not exceed 30% and 10% of total calories, respectively. Third, schools are reimbursed for the National School Lunch Program lunches they provide, from \$2.24 for free

lunches to 21 cents for regular price lunches.¹¹ Research has shown that, when compared with those not participating, students who participate in the National School Lunch Program have significantly higher intakes of vegetables (1.3 servings consumed at lunch vs 0.6 servings), and milk (0.8 servings vs 0.2 servings), and have lower intakes of sugar-sweetened beverages (0.3 servings vs 0.7 servings).¹² While it is clear that the National School Lunch Program provides a means for students to eat a healthy, well-balanced meal, 65% of high school females and 54% of high school males do not participate in the program.¹³ One of the reasons for the low participation rate is the presence of other foods that compete with the National School Lunch Program meals.

WHAT ARE “COMPETITIVE FOODS?”

Any school that participates in the National School Lunch Program is bound by regulations that restrict other foods that the school has for sale, so-called “competitive foods” (sometimes referred to as “junk foods”). These are broken down into 2 categories: “foods of minimal nutritional value” and all other foods offered for individual sale. A food of minimal nutritional value is defined as “a food that provides less than 5% of the RDA of each of 8 specified nutrients per serving.” The 8 specified nutrients are protein, vitamin A, vitamin C, niacin, riboflavin, thiamine, calcium, and iron. Examples of items in this category include sugar sweetened beverages and candy. All minimally nutritious foods and beverages are prohibited from being sold in food service areas during the meal period. All other foods and beverages offered for individual sale range from second servings of the school meal to foods that are purchased in addition to or in place of the school meal, such as foods present a la carte, or in vending machines, school stores, and snack bars. Examples of items in this category include chips, crackers, and ice cream. The sale of these items is not limited in any way by federal guidelines.¹¹

THE AVAILABILITY OF COMPETITIVE FOODS

Although there are restrictions on foods of minimal nutritional value, these foods are made available to students in many schools throughout the school day. A vending machine placed just outside the cafeteria door, for example, could sell any number of sugar-sweetened beverages and candy without violating the restrictions. The school cafeteria may sell a la carte items including chips, French fries, ice cream, and cookies. School groups may raise funds by selling candy or other food items before, during, or after school. The cafeteria could

Table 1. Examples of School District Nutrition Policies in Wisconsin²¹

School District	Policy
Lac du Flambeau	Any food sold must be <30% sugar by weight. Sugar-sweetened beverages are not allowed (including in bag lunches). Low fat milk is promoted, and water bottles are allowed in classrooms.
Appleton	Foods sold must have <30% of calories from fat and <10% calories from saturated fat. Sugar-sweetened beverage vending is prohibited and vending of juice products is allowed only after school. Milk, water, and 100% juice are available all day. Candy sales are limited to non-vending fundraisers.
Marshfield	Foods sold must have <7g fat per serving and <10% calories from saturated fat. No vending of sugar-sweetened beverages during lunch, vending of <10% juice after school only. Milk, water, and 100% juice are available all day.
Platteville	Food and beverage sales for students that are in direct competition with National School Lunch Program are prohibited. Foods of minimal nutritional value are not sold to students until the end of the school day.
Middleton-Cross Plains	Foods of minimal nutritional value cannot be sold to students from the start of the school day to the end of the school day in food service areas. Either the principal or the food services director must approve the sale of any competitive food in the school.

also contract with a fast food company to sell their pizza or tacos, for example. An overview of major findings about children’s access to competitive foods in the school follows.

- Vending machines, school stores, or snack bars are present in 43% of elementary schools, 74% of middle schools, and 98% of high schools nationwide. Among these alternate food service areas, sugar-sweetened beverages are offered 76% of the time, 100% juice 56%, bottled water 49%, and low fat milk 24%.¹⁴

- A la carte foods comprise at least half of all food sales in one third of schools offering this option, and in some schools sales represent 70% of total lunchtime revenue.¹⁵
- Only 10% of “chips and crackers,” the largest category of a la carte foods, are low-fat items, and fruits and vegetables represent only 4.5% of a la carte items.¹⁶
- At least 20% of US schools sell brand name fast food to students on a daily, weekly, or monthly basis.¹⁷

The sales of items in these examples are not prohibited by National School Lunch Program guidelines, although they clearly represent direct opposition to the programs’ ideals of providing healthy meals to students.

RESEARCH ON THE EFFECTS OF OFFERING COMPETITIVE FOODS

The nutrition behavior effects of offering competitive foods have been examined with various methods. One study examined the change in eating behaviors during the transition from fourth to fifth grade in a school where a la carte was only available to fifth graders. Over the transition period, the study showed a 33% decrease in fruit consumption, 42% decrease in non-fried vegetable consumption, and a 35% decrease in milk consumption. The study also showed a 68% increase in fried vegetable consumption, and a 62% increase in sugar-sweetened beverage consumption over the school year.¹⁸ Another study concluded that students without a la carte consume a half serving of fruit and 1 serving of vegetable more per day than students with lunchtime a la carte. The final study we reviewed indicated an 11% decrease in daily fruit and vegetable consumption for every additional vending machine present in schools.¹⁹ Finally, several uncontrolled case studies have reported that changes in competitive food policies have reduced disruptive behaviors among students.²⁰

POLICIES TO LIMIT COMPETITIVE FOODS

Because of the negative consequences associated with competitive foods, initiatives that limit availability or content of foods offered in schools have been advocated. These initiatives exist at many levels nationwide, including state, district, and school policies, and come in many different forms including restrictions on access, nutritional content, approval, and pricing of competitive foods. So far, 19 states have enacted limitations on competitive foods beyond those that the USDA has put into place. Of these, 15 have restricted access to competitive foods only. For example, New York prohibits the sale of foods of minimal nutritional value on school grounds from the beginning of the school day to the

Table 2. Effects of Policies intended to Reduce Consumption of Competitive Foods²²

School District	Policy	Impact
North Community High School in Minneapolis, Minnesota	Increased the number of vending machines in their school from 4 to 16; 13 offered water or 100% juice, 2 offered sports drinks, and 1 offered soda and sweetened beverages (restricted to after school hours); Competitive pricing favored healthier options.	Total sales doubled and profits increased by \$4000 during the first year; Sugar-sweetened beverage sales decreased to 100 cases/year (from 150 cases); Water sales topped 500 cases, sports drinks 300 cases, and 100% juice 80 cases the first year.
Folsom-Cordova School District in California	Replaced French fries, taco pockets, cheeseburgers, nachos, pizza, soda and chips with fresh deli sandwiches, sushi, pasta, salads, soups, and fajitas.	School lunch revenues increased.
PTA at Vista High School in California	Bought own vending machines; Replaced high fat and sugar foods with yogurt, granola and fruit; Introduced water, sports drinks, 100% juice, milk and smoothies; Sold sugar-sweetened beverages at a higher price.	The school now averages \$25,000 per month in sales and \$6000/month in profits.
Hemet Unified School District in California	Banned the sugar-sweetened beverage sales during the day; Contracted with a soft-drink company to sell juices, sports drinks and water.	The average annual profit exceeds \$40,000.
Venice High School in Los Angeles	Replaced soft drinks with water, 100% juice and milk; Replaced candy bars with granola and cereal bars in the student store and vending machines.	Sales in the student store were up \$1000 per month during the first year. After 2 years, sales had doubled (\$6100 in March 2002 to \$12,000 in March 2004).
Fayette County Public Schools in Kentucky	Increased healthy vending options from 21% to 72% of offerings and healthy snacks from 1% to 40%; Enacted competitive pricing for healthy options.	They saw a \$4000 increase in profits over the first quarter.

end of the last lunch period. California, Texas, Florida, and West Virginia have set their own nutritional standards for competitive foods. In West Virginia, for example, foods for sale in school must be <40% sugar by weight and have <8 g of fat per 1 oz serving. Juice products must have >20% real fruit juice. The remaining 32 states, including Wisconsin, have not enacted any standards beyond those enforced by the USDA rules for the National School Lunch Program.²³

Despite the lack of state-level action, many individual districts in Wisconsin have created their own standards for the sale of competitive foods in schools (Table 1). Some have recommended voluntary policies where parents and teachers avoid using candy as rewards to students, or fundraising activities that use candy or other non-nutritious foods. Available surveys indicate that principals, teachers, and parents desire improved school nutrition standards in school settings.²⁴⁻²⁶

NATIONAL POLICY RECOMMENDATIONS

A number of national health entities have spoken out about this issue. In 2001, the US Surgeon General issued a “Call to Action to Prevent and Decrease Overweight and Obesity.” This document provides several action steps that schools can take to reduce the rates of overweight. It is recommended that schools “adopt policies ensuring that all foods and beverages available on school campuses and at school events contribute toward eating patterns that are consistent with the Dietary Guidelines for Americans.”²⁷ The Centers for Disease Control and Prevention (CDC) states, “Healthy and appealing foods should be available in meals, a la carte items, snack bars, and vending machines and schools should discourage the sale of foods high in fat, sodium and added sugars.”²⁸ The American Academy of Pediatrics states, “Increases in carbonated beverage intake have been linked to obesity, and therefore the sale of these beverages should not

be promoted at school. Pediatricians are encouraged to work with school administrators and others in the community on ways to decrease the availability of foods and beverages with little nutritional value and to decrease the dependence on vending machines, snack bars, and school stores for school revenue.²⁹

ARGUMENTS AGAINST POLICIES TO LIMIT AVAILABILITY OF COMPETITIVE FOODS IN SCHOOLS

One argument against limiting the sale of unhealthy foods in schools is that the schools will lose money. However, there are practices currently in place at schools throughout the nation that have managed to improve healthy food options without financial losses (Table 2). Several studies have shown that when nutrient-dense foods are offered and promoted through various means, children choose them more often. One study measured a la carte sales at baseline and during a low price period. A la carte sales of fruit doubled and carrot sales increased 4-fold when prices were lowered.³⁰ A study on a vending machine pricing strategy to promote purchases of low-fat food items found a 25% reduction in price resulted in 39% increase in low-fat sales, and a 50% reduction in price resulted in 93% increase in low-fat sales, with no resulting change in total profits of the machines.³¹ A study examining environmental interventions such as advertising and prominent placement to increase a la carte availability and sales of low-fat food items found low-fat food items increased from 28% of foods offered at baseline to 42% of food offerings after the 2-year intervention. In addition, the percentage of low-fat sales increased from 22% to 34% in the 2 years with no decrease in a la carte profits.³² These studies suggest that offering a variety of nutritious foods with pricing strategies or other promotions increase the likelihood that children will make healthy choices.

Another major argument against limiting competitive foods in schools is that students will leave campus for meals or bring in food from outside. This is a real issue for schools with open campus policies or those with convenience stores nearby where students can purchase minimally nutritious foods. This argument again assumes that students will not choose healthy items if they are offered, and merits further inspection. First, only 26.6% of high schools, 10.6% of middle/junior high schools, and 6.0% of elementary schools nationwide have some type of open campus policy.³³ A study by CDC showed the only factor that affected National School Lunch Program participation was open campus policy, regardless of the schools meal offerings: 49%

of students with open campus participate in National School Lunch Program compared to 58% with a closed campus. Of students who do not participate in the National School Lunch Program, about half eat a lunch brought from home.³⁴

It is unlikely a change in policy to offer foods that are more nutritious will lead to an exodus of students off campus, as nearly half already participate in the National School Lunch Program. A potential downside may be that more students bring in foods from outside sources. This has led some schools to institute policies that limit what students bring in their lunches, for example banning soda or candy in bag lunches. Finally, the change of a food service program to providing healthy options may encourage involvement from the increasingly health conscious student population. In states that have limited competitive foods in schools, National School Lunch Program participation rates have stayed the same or increased. In 2003, the food services director in Berkeley, California overhauled lunches at the district's 11 elementary schools, 3 middle schools, and 1 high school. Sugar-sweetened beverages and candy were eliminated, and the lunchrooms began offering a variety of National School Lunch Program-reimbursable, healthy meals every day, along with certain incentives such as free bottled water and produce bar with each meal purchase. In the middle schools, paid meals increased by 1560%; free and reduced meals went up by 30%; and adult meals increased 525%. In the high schools, total meals sold were up 1150% in the first month.³⁵ This evidence suggests offering healthy choices can increase participation in the National School Lunch Program and decrease the number of students going off-campus for lunch.

SUMMARY

Health care professionals can play a critical role in improving the health of children by supporting evidence-based community and school health policies. A review of the research suggests limiting competitive foods in schools is possible without financial losses. In fact, many of these changes proved profitable to schools while aligning nutrition policy with the nutrition messages that schools and parents are teaching. Parents, teachers, and school administrators are supportive of limiting sales of unhealthy foods and beverages to children in schools. Although research suggests that limitation of these food choices could decrease the risk of overweight in children, unfortunately there is no research on measuring rates of overweight after these policies have been implemented. Though on its own the limitation of competitive food sales in schools will not solve the problem

of obesity, combined with efforts to promote healthy eating,³⁶ these policies may create a school nutrition environment that promotes and supports the health and well being of children.

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