Dispensing Junk:

How School Vending Undermines Efforts to Feed Children Well

Center for Science in the Public Interest

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Executive Summary

In September and October 2003, 120 volunteers in 24 states (including the District of Columbia) surveyed the contents of 1,420 vending machines in 251 schools, including 105 middle and junior high schools, 121 high schools, and 25 schools with other combinations of these grade levels (*e.g.,* 7th-12th grades).

The results suggest that the overwhelming majority of options available to children in school vending machines are high in calories and/or low in nutrition. **In both middle and high schools, 75% of beverage options and 85% of snacks were of poor nutritional quality.** The most prevalent options are soda, imitation fruit juices, candy, chips, cookies, and snack cakes. The high prevalence of junk food in school vending machines does not support students' ability to make healthy food choices or parents' ability to feed their children well.

This is of concern because 1) 74% of middle/junior high schools and 98% of senior high schools have vending machines, school stores, or snack bars,[1] 2) children are in school for a substantial portion of the week, and 3) obesity rates are rising rapidly in children and teens.[2]

Given the rising obesity rates and children's poor eating habits, the time has come to ensure that school environments support healthy eating and parents' efforts to feed their children well. A number of policies and programs should be put in place or strengthened to address childhood obesity. **One important strategy is for federal, state, and/or local governments, schools, and school districts to enact policies to ensure that foods sold out of vending machines, school stores, fundraisers, a la carte, and other venues outside of the school meal programs are healthful and make a positive contribution to children's diets.**

At the federal level, Congress should give the U.S Department of Agriculture (USDA) authority to establish and enforce regulations for all food sales anywhere on school campuses throughout the school day as a condition for participating in the National School Lunch Program or School Breakfast Program. USDA has strong nutrition policies for school meals. It also should set nutrition standards for foods and beverages sold outside those meals.

States, cities, school districts, and schools also could implement strong nutrition standards for foods and beverages sold out of vending machines, school stores, a la carte (snack lines), fundraisers, and other venues outside of the school meal programs. We recognize that school budgets are tight and that the sale of foods in schools provides much-needed revenue. However, a number of schools around the country have replaced soda in school vending machines with healthier beverages and have not lost money.

Introduction

Vending machines are prevalent in schools, yet quantitative data regarding their contents are lacking. Such data would be important to have because most children eat diets of poor nutritional quality, with too much saturated fat, sodium, and refined sugars and too few nutrient-rich fruits, vegetables, and whole grains.[3,4,5,6] Those nutrient imbalances can lead to heart disease, high blood pressure, cancer, dental cavities, and other health problems.[7] In addition, children's calorie intake has increased[8,9] (and they are insufficiently active) and, as a result, rates of overweight in children have increased.[2] While obesity is a complex, multi-factorial problem, over-consumption of soft drinks and snack foods plays a key role.[10,11,12]

Junk food in school vending machines undermines parents' efforts to feed their children well. (This is especially problematic when children have diet-related health problems, such as high cholesterol or diabetes.) When parents send their child to school with lunch money, they do not know whether the child will buy a balanced school lunch or a candy bar and a soda. Long cafeteria lines, short lunch periods, and activities during the lunch period mean that some students rely on foods from vending machines rather than buy lunch from the cafeteria line.

The food industry is taking advantage of schools' financial problems by offering them incentives to sell low-nutrition foods in schools. But bridging school budget gaps by selling junk food to students is a shortsighted approach. In the long run, society is sure to spend more money treating the resulting obesity and diet-related diseases, such as diabetes, heart disease, cancer, and osteoporosis, than schools can raise by selling soda and snack foods to students.

There are ways schools can raise money without jeopardizing children's health. A number of schools in Maine, California, Minnesota, Pennsylvania, and elsewhere have replaced soda with healthy beverages and not lost revenue. In addition to selling healthy foods, schools can sell gift wrap or candles, sponsor fun runs, host car washes, or conduct other profitable fundraisers that do not undermine children's health.

Methods

In late September and early October 2003, 120 individuals in 24 states (including Arkansas, California, Connecticut, the District of Columbia, Illinois, Iowa, Maine, Maryland, Michigan, Mississippi, Missouri, Montana, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Vermont, Washington, and Wisconsin) surveyed the contents of vending machines in their local middle and high schools. The individuals collecting the data were primarily health professionals, employees of health organizations, and school employees. Volunteers surveyed a total of 1,420 vending machines in 251 schools, including 105 middle and junior high schools, 121 high schools, and 25 schools with other combinations of these grade levels.

School sites included both urban and rural schools, schools in a range of socioeconomic areas, and schools ranging in size from 110 to 2,600 students. Vending machines in areas accessible only to teachers and staff were not included.

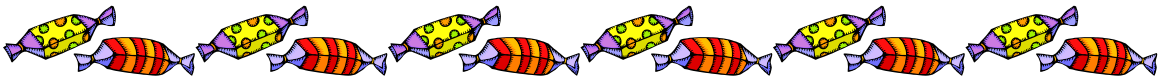
The average number of vending machines per high school was eight. Some high schools had only one vending machine, while others had as many as 22 vending machines. The average number of vending machines per middle or junior high school was four. Some middle and junior high schools had only one vending machine, while others had up to 10 vending machines.

Vending machines were assessed by counting the number of slots per machine for each beverage or snack category and totaling the number of slots in all machines. Study participants were given a standardized survey form (see Appendix A) and protocol. Participants had the opportunity to participate in a pre-survey conference call to discuss the protocol and methods for the survey. Participants sent their completed surveys to the Center for Science in the Public Interest (CSPI) for data aggregation and analysis.

The categorization of foods and beverages as “healthier” and “less healthful” was based on and generally in accordance with the nutrition standards for school foods developed by a national panel of experts convened by the California Center for Public Health Advocacy.[13] The following types of beverages were categorized as "healthier" options: water, fruit juice containing at least 50% real juice, low-fat (1%) or fat-free milk (regular or flavored), and diet drinks. The following types of beverages were categorized as "less healthful" options: soda pop (regular), fruit drinks containing less than 50% real juice, whole or 2% milk, sports drinks, iced tea, and lemonade. Only 1% of the options in beverage vending machines ended up being categorized into the “other” category.

The following types of snacks were categorized as "healthier" options (which includes healthy foods and nutritionally-improved versions of unhealthy vending snacks): low-fat chips, pretzels, crackers, Chex Mix, fruits, vegetables, granola bars, cereal bars, nuts, trail mix, low-fat cookies, and other low-fat baked goods. While some of the options are not the healthiest products – high in sodium or made with refined flour – they are

considered healthier alternatives to common vending options. The following types of snacks were categorized as being of "poor nutritional quality": regular chips, crackers with cheese, candy, cookies, snack cakes, and pastries. Foods that did not fit into these categories were categorized as "other." Just 2% of the options in snack vending machines ended up being categorized into the “other” category.



Results

The vending machine options in middle and high schools were markedly similar. In middle-school vending machines, 73% of beverage options and 83% of snack options were of poor nutritional quality. In high-school vending machines, 74% of beverage options and 85% of snack options were nutritionally-poor options.

The types of beverages available in middle and high school vending machines are listed in Table 1. **Seventy percent of those beverages were sugary drinks such as soda pop, juice drinks, iced tea, and sports drinks.** Of the sodas available in vending machines for both high schools and middle schools, 86% of soda slots were regular sugary sodas and 14% were diet. 12% of the beverages available were water. Of the “juices” offered, two-thirds (67%) were juice drinks that contained less than 50% juice. Only 5% of beverage options were milk. The majority (57%) of milks offered in school vending machines were the fattier types (either whole or 2%), with 43% of the milk either low-fat (1%) or fat-free.

The types of snacks available in middle and high school vending machines are listed in Table 2. The snack items most commonly available were: candy (42%), chips (25%), and sweet baked goods (13%), which together accounted for 80% of snacks available in school vending machines.

Children need fruits and vegetables to provide key nutrients and reduce future risk of heart disease and cancer. Yet of 9,723 total snack slots, only 26 slots contained a fruit or vegetable. Only 7% of the beverage options were fruit juice (*i.e.,* contained greater than 50% real juice). This finding highlights the potential value of increasing the number of refrigerated snack vending machines in schools to provide more fruits and vegetables to children.

Table 1: Beverages Available in Middle and High School Vending Machines

Beverage Type	Middle Schools	High Schools	Middle Schools, High Schools, & Other Secondary Schools Combined
	Percent of Total (Number of Slots)	Percent of Total (Number of Slots)	Percent of Total (Number of Slots)
Soda (regular)	28 (1110)	39 (3489)	36 (4860)
Fruit drinks (less than 50% real juice)	17 (664)	12 (1079)	13 (1801)
Sports drinks	17 (671)	11 (994)	13 (1826)
Iced tea, lemonade, or other sweetened drink	9 (362)	8 (752)	9 (1167)
Whole or 2% milk (including flavored)	1 (46)	3 (268)	3 (367)
Water	13 (515)	11 (1001)	12 (1611)
Fruit juices (at least 50% real juice)	8 (295)	6 (563)	7 (896)
Diet soda	4 (149)	6 (555)	6 (769)
Low-fat/1% or fat-free milk (including flavored)	1 (47)	2 (177)	2 (276)
Other drinks	2 (64)	<0.5 (13)	1 (77)
TOTAL	100 (3,923)	98 (8,891)	102 (13,650)

Table 2: Snacks Available in Middle and High School Vending Machines

Snack Type	Middle Schools	High Schools	Middle Schools, High Schools, & Other Secondary Schools Combined
	Percent of Total (Number of Slots)	Percent of Total (Number of Slots)	Percent of Total (Number of Slots)
Candy	38 (882)	43 (3028)	42 (4062)
Chips (regular)	24 (555)	25 (1787)	25 (2391)
Cookies, snack cakes, and pastries	14 (310)	13 (928)	13 (1270)
Crackers with cheese or peanut butter	7 (154)	4 (306)	5 (484)
Chips (low-fat) or pretzels	7 (152)	5 (332)	5 (489)
Crackers or Chex Mix	2 (52)	3 (235)	3 (303)
Granola/cereal bars	2 (56)	1 (103)	2 (171)
Low-fat cookies and baked goods	2 (44)	1 (106)	2 (155)
Nuts/trail mix	2 (41)	1 (89)	1 (141)
Fruit or vegetable	<0.5 (8)	<0.5 (18)	<0.5 (26)
Other snacks	2 (39)	3 (178)	2 (231)
TOTAL	100 (2,293)	100 (7,110)	100 (9,723)

Rationale for Improving School Foods

I. Schools should practice what they teach

This study found that most choices available in school vending machines are of poor nutritional quality. Current school vending practices are not supportive of healthy eating.

Schools should practice what they teach. Selling low-nutrition foods in schools contradicts nutrition education and sends children the message that good nutrition is not important.[14] The school environment should reinforce nutrition education in the classroom to support and model healthy behaviors.

II. The sale of low-nutrition foods in schools undermines parents' ability to feed their children well

Parents entrust schools with the care of their children during the school day. The sale of low-nutrition foods in schools makes it difficult for parents to ensure that their children are eating well. This is especially problematic when children have diet-related conditions, such as diabetes, high cholesterol, or overweight.

Without their parents' knowledge, some children spend their lunch money on the low-nutrition foods from vending machines rather than on balanced school meals. Long cafeteria lines, short lunch periods, or activities during the lunch period lead some students to purchase foods from a vending machine rather than a lunch from the cafeteria line.

III. Children's eating habits and health

Obesity rates have doubled in children and tripled in adolescents over the last two decades.[2] As a result, diabetes rates among children also have increased and type 2 diabetes can no longer be called "adult onset" diabetes. Also, 60% of obese children have high cholesterol, high blood pressure, or other risk factor for cardiovascular disease.[15] While obesity is a complex, multi-factorial problem, over-consumption of soft drinks and snack foods plays a key role.[10,11,12]

While low levels of physical activity are an important part of the problem, children are clearly eating more calories now than in the past. Between 1989 and 1996, children's calorie intake increased by approximately 80 to 230 extra calories per day (depending on the child's age and activity level).[8,9] Soft drinks and low-nutrition snack foods are key contributors to those extra calories. Children who consume more soft drinks consume more calories[16,17] and are more likely to be overweight[10,11] than kids who drink fewer soft drinks. A recent study found that a school-based nutrition education program that encouraged children to limit their soda consumption reduced obesity among the children.[18]

Consumption of soft drinks also can displace from children's diets healthier foods[16,17,19,20,21] like low-fat milk, which can help prevent osteoporosis, and juice, which can help prevent cancer. In the late 1970s, teens drank almost twice as much milk as soda pop. Twenty years later, they are drinking twice as much soda pop as milk. The number of calories children consume from snacks increased by 30% (from 460 to 610 calories) between 1977 and 1996.[12]

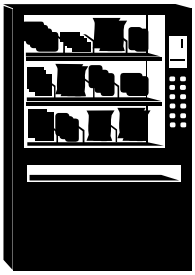
The health benefits of eating fruits and vegetables are well-documented; eating enough fruits and vegetables is important for preventing cancer, heart disease, high blood pressure, and other diseases.[22] People who eat five or more servings of fruits and vegetables each day have half the cancer risk of those who eat fewer than two

servings per day.[23] However, children are not consuming enough fruits and vegetables to receive maximum health benefits. The average 6 to 11 year old eats only 3.5 servings of fruits and vegetables a day, achieving only half the recommended seven servings per day for this age group.[4] Fewer than 15% of elementary-school-aged children eat the recommended five or more servings of fruits and vegetables daily.[4] While fruit juices can have as many calories as soda, they provide important nutrients and health benefits that soda does not.

Milk is an important source in children's diets of essential vitamins and minerals, such as calcium and vitamins A and D. Since 98% of maximum bone density is reached by age 20, it is especially important that children get enough calcium.[24] However, milk is also the largest source of saturated fat in children's diets.[25] While low-fat and fat-free milk make important contributions to children's diets, whole and 2% milk contribute to children's risk of heart disease.

IV. Short-term profits from selling junk food in schools pale in comparison with the long-term costs for diet-related diseases

While schools are facing serious budget gaps, it is shortsighted to fund schools at the expense of our children's health. Diet- and obesity-related diseases, such as diabetes, heart disease, and cancer, cause disabilities and affect quality of life. The financial costs also are staggering. Annual medical spending attributed to obesity is estimated to be $75 billion per year, and half of that amount is financed by federal taxpayers through Medicare and Medicaid.[26] From 1979 to 1999, annual hospital costs for treating obesity-related diseases in children rose threefold (from $35 million to $127 million).[27]



The federal government also spends large amounts of money treating other diet-related diseases such as heart disease, cancer, diabetes, stroke, and osteoporosis through the Medicaid and Medicare programs and federal employee health insurance. Those diseases have their roots in childhood. According to the USDA, healthier diets could save at least $71 billion per year in medical and related costs.[28]

V. Schools that stop selling soda and junk food are not losing money

Even in the short-term, schools are finding that they can raise funds without undermining children's diets and health. A number of schools and school districts including Aptos Middle School (CA), Folsom Cardova Unified School District (CA), Monroe High School (CA), Venice High School (CA), Vista High School (CA), Fayette County Public Schools (KY), Old Orchard Beach Schools (ME), School Union 106 (ME), Shrewsbury School District (MA), North Community High School (MN), McComb School District (MS), Whitefish Middle School (MT), Sayre Middle School (PA), and South Philadelphia High School (PA) have improved the nutritional quality of school foods and beverages and not lost money.

Venice High School in Los Angeles eliminated unhealthy snack and beverage sales on campus. The school vending machines now offer a variety of waters, 100% juices and soy milk as well as a variety of healthy snacks including granola and cereal bars. After one year, snack sales in the student store were up by over $1,000 per month compared to the same time the previous year. Two years after the changes, snack sales per month had roughly doubled ($6,100 in May 2002 compared with $12,000 in March 2004). The students also raise significant funds with fundraisers that do not undermine children's health, such as a celebrity basketball game, car washes, and holiday gift wrapping.

Old Orchard Beach Schools in Maine wrote school vending policies that led to the removal of sodas and junk foods, and replaced them with water, 100% fruit juices, and healthier snack options. The vending machine signage was changed to advertise water instead of soda pop. Vending revenues have remained the same as they were prior to the changes.

North Community High School in Minneapolis replaced most of its soda vending machines with machines stocked with 100% fruit and vegetable juices and water and slightly reduced the prices of those healthier options. As a result, the sale of healthier items increased and the school has not lost money.

Though school vending is lucrative, it often represents only a small percentage of total school budgets. Soft drink contracts generate between $3 and $30 per student **per year**; even the most profitable contracts provide less than 0.5% of a school district's annual budget.[29] In addition, the money raised from vending machines in schools is not a donation from the soft drink and snack food industries – it comes from the pockets of children and their parents.

VI. School foods can be improved at the federal, state, or local level

States and localities have historically left the development of nutritional guidance to the federal government. The federal government has developed the Food Guide Pyramid, *Dietary Guidelines for Americans*, and nutrition facts labeling standards for packaged foods.

In addition, unlike other aspects of education that are primarily regulated at the state and local level, school foods have historically been regulated at the federal level – by Congress and the U.S. Department of Agriculture (USDA). The National School

Lunch Program was created in 1946 under the Truman administration, “as a measure of national security, to safeguard the heath and well-being of the Nation’s children and to encourage the domestic consumption of nutritious agricultural commodities and other food.”[30]

The federal government invests enormous resources in the school meal programs ($8.8 billion in FY 2003, including cash payments and commodities) and has strong nutrition standards for those meals, as well as provides technical assistance and support for states and local food service authorities to meet those standards.[31] Selling junk foods in school vending machines undermines that investment.

USDA sets detailed standards and requirements for the foods provided through the school meal programs, including which foods are served, the portion sizes of those foods, and the amounts of specific nutrients that school meals must provide over the course of a week. In contrast, foods sold in vending machines, a la carte lines, fund-raisers, and other venues outside the school meal programs are not required by the USDA to meet comparable nutrition standards. The USDA currently has limited authority to regulate those foods.

For foods sold outside of school meals, USDA restricts only the sale of "Foods of Minimal Nutritional Value" (FMNV). A FMNV provides less than 5% of the Reference Daily Intake (RDI) for eight specified nutrients per serving.[32] During meal periods, the sale of FMNV is prohibited by federal regulations in areas of the school where USDA school meals are sold or eaten. However, FMNV can be sold anywhere else on-campus -- including just outside the cafeteria -- at any time. In addition, many nutritionally poor foods are not considered FMNV despite their high contents of saturated or trans fat, salt, or refined sugars, including chocolate candy bars, chips, and fruitades (containing little fruit juice), and thus can be sold anywhere on school campus anytime during the school day.

In order for USDA to set nutrition standards for all foods sold on school campuses throughout the school day, Congress needs to grant USDA additional authority. Implementation of those nutrition standards could be required as a condition for participating in the school meal programs.

States and cities have express authority to set nutrition standards in addition to the federal standards for foods sold out of school vending machines, a la carte lines, and other venues outside of the meal programs. A number of states have set or are working to set stronger nutrition standards for such foods (for examples, see http://cspinet.org/schoolfood/school_foods_kit_part3.pdf). Such state and local actions are needed given the limitations of current federal regulations.

Modest improvements in vending machine offerings can significantly reduce the calorie content of items purchased by students. Below is an example from Vista High School (California) of vending machine offerings before and after improving their nutritional quality.

Before

AVERAGE NUTRIENTS:
275 Calories
46% Fat
400 mg. Sodium

After

AVERAGE NUTRIENTS:
180 Calories
29% Fat
237 mg. Sodium

Conclusions

This study found that the overwhelming majority of beverage and snack options in school vending machines are of poor nutritional quality. While foods and beverages sold in school vending machines are not the sole cause of childhood obesity, improving school nutrition environments is a key step toward ensuring that children have access to foods that promote their health and well-being. (For more information and model policies regarding other approaches to addressing nutrition, physical activity, and obesity, visit www.cspinet.org/nutritionpolicy.)

With skyrocketing childhood obesity rates, it is urgent that schools, school districts, and local, state, and federal governments enact policies to ensure that all foods and

beverages available in schools make a positive contribution to children’s diets and health.

Appendix A: SURVEY OF SCHOOL VENDING MACHINES

Name of school: _____Grade levels: _____

City: _____ State:_____

# of vending machines in school: _____ # of students in school: _____

Name of data collector: _____

Snacks	**# of Slots in Machine 1**	**# of Slots in Machine 2**	**# of Slots in Machine 3**
Chips* – regular			
Chips* – low-fat or pretzels			
Crackers/ Chex Mix			
Crackers with cheese or peanut butter			
Fruit or vegetable			
Granola/cereal bars			
Nuts/trail mix			
Candy			
Cookies/snack cakes/pastries			
Low-fat cookies and baked goods			
Other food:			
Other food:			
Total # of slots in vending machine			
	# of Slots in Machine 4	**# of Slots in Machine 5**	**# of Slots in Machine 6**
Beverages			
Soda (regular)			
Diet soda			
Fruit drink (less than 50% real juice)			
Fruit juice (at least 50% real juice)			
Water			
Sports drinks			
Iced tea, lemonade, or other sweetened drink			
Whole or 2% milk (including flavored)			
Low-fat/1% milk or fat-free milk (including flavored)			
Other drink:			
Total # of slots in vending machine			

*Note: Chips = potato chips, tortilla chips, cheese snacks, etc.

Comments/Notes:

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