



Translating Research into Practice

## Improving Student Nutrition through School Vending Machine Policies

Matt Landis, David Ahrens, Patrick Remington

March 2005  
Volume 6 Number 1

Obesity is a major public health problem among Wisconsin students, posing serious adverse health effects today and in the future. One-quarter of Wisconsin high school students are overweight or at risk of becoming overweight<sup>1</sup>. Not surprisingly the dietary habits of many adolescents and teens are poor. National findings indicate that over 7% of male and 18% of female teenagers do not meet *any* of the dietary guidelines for daily consumption of the five food groups, while only 2% meet all dietary guidelines<sup>2,3</sup>. Furthermore, the annual obesity related treatment costs in Wisconsin exceed \$1.48 billion<sup>4</sup>. Given the increasing prevalence of obesity, along with limited treatment effectiveness, public health models for obesity prevention and control must be considered<sup>5</sup>.

One way to address this public health problem is to consider the role of school nutrition policies in the current obesity epidemic. Healthy eating during adolescence helps individuals achieve full growth potential, promote optimal health and well being, and reduce the risk of chronic disease in adulthood. The higher caloric demand of teenagers is often satisfied by supplementing mealtime calories through snacking, and in schools through the use of vending machines. However, the limited nutritious choice of typical vending options can increase dietary fat and sugar intake<sup>6</sup>.

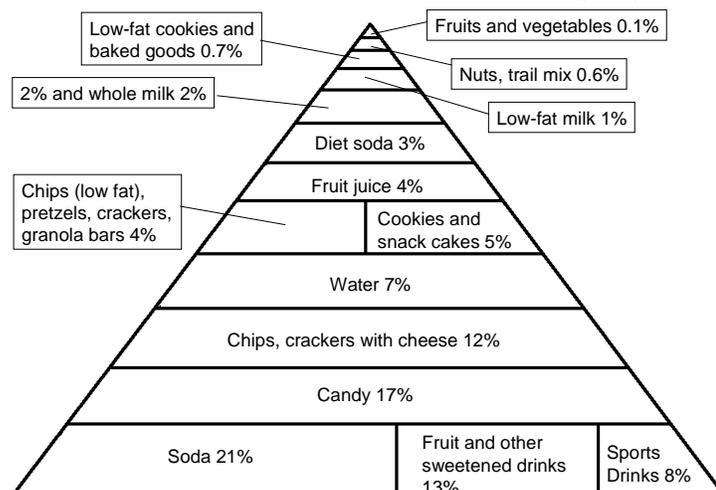
One approach that has been considered by schools are policies which regulate the use of their vending machines by students.

Numerous studies indicate a preponderance of energy dense nutrient poor “junk” foods in school vending machines. A nationwide sample of middle and high school vending machines found that sugar sweetened soda accounted for 21% of vending slots, while low fat milk accounted for only 1% of the slots<sup>7</sup>. Despite the need for more fruit and vegetable servings in the American diet, the school vending machine offers such foods in only 0.1% of selections (see pyramid). Among Wisconsin middle and high schools, 88% provide access to foods other than those in school meal programs, with vending machines as the main source<sup>8</sup>. The overabundance of foods of minimal nutritional value (FMNV, commonly called “junk” foods) in vending machines may encourage students to rely on these foods for energy.

Decreasing visibility and access to low nutrient high calorie food, or increasing availability of healthier foods, may guide students to healthier food choices. In Wisconsin, two-thirds of high schools have milk vending machines, the highest percentage of all the states<sup>12</sup>. While this provides a choice, it does not actually replace or restrict access to soda and other foods of minimal nutritional value.

Nationally, the United States Department of Agriculture (USDA) school meal program guidelines are the principal policies that address school based nutrition standards. These guidelines define “competitive foods” as any food offered at school other than meals served through USDA’s school meal programs, including foods of minimal nutritional value purchased from vending machines<sup>3</sup>. Although USDA guidelines prohibit the sale of foods of minimal nutritional value in the food service areas during school meal periods, these regulations do not extend beyond the food service area, even during meal periods.

**SCHOOL VENDING MACHINE PYRAMID (U.S.)<sup>15</sup>**



Patrick Remington, MD, MPH, Director  
D. Paul Moberg, PhD, Deputy Director  
David Kindig, MD, PhD,  
Department of Population Health Sciences  
University of Wisconsin Medical School  
Suite 760, 610 Walnut Street  
Madison, WI 53726-2397

Many states and localities have experimented with approaches to vending machine policies. Such policies are intended to reduce poor nutritional choice through decreasing the number of opportunities to purchase such foods. These approaches have at times been limited by financial and contractual considerations such as pouring rights, exclusive contracts with food companies, and consumption quotas<sup>10</sup>. Nonetheless, schools do have several options available, described below.

### Restricting times of access

Restricting vending machine access to certain times may encourage students to moderate unhealthy eating and consume a more nutritious school lunch. Many school districts and states have placed limits on hours of access or banned vending machine sales during school hours. For example, the Kewaunee School District prohibits sale or distribution of soda and other foods of minimal nutritional value from the start of the school day to the end of the last lunch period, as well as any foods that compete with the food service program (except the milk vending machine).

### Banning low nutrient high caloric foods

Los Angeles, the second largest U.S. school district, banned all soda contracts and sales as of July, 2004<sup>11</sup>. Colorado and West Virginia are among the 19 states (not including Wisconsin) that have implemented supplemental policy beyond the USDA's to ban or limit sales of vended foods<sup>12</sup>. Such policies reduce poor nutritional choice through decreasing the number of opportunities to purchase such foods. Moreover, these policies also remove one of the few, if only, commercial displays on school grounds. Removal of these machines eliminates the message to students that constant access to "junk" food is a normal condition.

### Changing pricing strategies and adding vending machines

Many schools rely on vending machines as a source of revenue. As a result school officials fear the loss of vending machine revenue during a time of tight budgets. However, schools can devise vending strategies that encourage spending on nutritious foods which satisfy both nutrition and revenue objectives. Research has shown that purchases of

healthier food items increase when these products' prices are lowered in relation to other products<sup>5</sup>. Additionally, revenue can be maintained by raising prices on high fat items while lowering prices on low fat items<sup>6</sup>. The researchers concluded that implementation of nutrition based pricing strategies could have lasting effects on students, as nutritional improvements were maintained throughout the study.

Moreover, lower prices of more healthy foods may help vendors win over health conscious consumers otherwise skeptical of vending machines. For instance, North Community High School in Minneapolis increased the number of vending machines from 4 to 16, with 13 machines stocked with water or 100% juice, two with sports drinks, and one with soda (which has limited hours of sale)<sup>13</sup>. The school sold water for \$0.75, sports drinks and 100% juices for \$1.00 and soda for \$1.25. Soda sales decreased; yet vending profits *increased* nearly \$4,000 a year and water became the top seller. Another approach taken by the Marshfield School District is to sell mascot endorsed bottled water labeled "Tiger Water," which has fostered school spirit and increased revenue while encouraging nutrition. Approaches like competitive pricing strategies, actually adding vending machines, and personalizing water bottles can encourage better nutrition in the entire student body. Alongside other nutrition intervention strategies, pricing strategies may facilitate and reinforce students' improved nutrition.

---

### Alternative Vending Machine Policies

- Restricting times of access
  - Banning low nutrient high caloric foods
  - Changing pricing strategies and adding vending machines
- 

### Conclusion

Habits that form during childhood and adolescence are often carried into adulthood, making it crucial to form good nutritional practices early in life. The alarming increases in obesity, due to the nutritional environment in schools, suggest that environmental modification is a necessary intervention strategy as part of a multipronged approach. Policies addressing school vending machines may play a role in addressing this issue, since students spend approximately one third

of their day at school. As nutrition education is integral to most school curricula, the stage is already set for good nutrition habits to be cultivated. In striving to be effective educators, schools should consider ways to extend health and nutrition education beyond the classroom to school snack and meal times. One way to do this is by addressing issues of vending machine access and quality which strengthen USDA guidelines.

Success involves the collective input from those dedicated to improving school health. Half of Wisconsin middle and high schools currently have comprehensive nutrition policies in place<sup>8</sup>. Coupled with better nutritional education, better nutritional standards, and better nutritional policy, substantive changes in vending machine policy will likely prove integral to improving nutrition and battling the obesity epidemic.

### Foods of Minimal Nutritional Value (FMNV)<sup>14</sup>

**Defined:** Foods that provide less than 5% of the recommended daily allowance for 8 specified nutrients: protein, vitamin A, vitamin C, niacin, riboflavin, thiamine, calcium, and iron.

**Examples:** Soda, frozen desserts, chewing gum, hard candy, jelly candy, taffy and other spun candy, marshmallows, licorice, candy coated popcorn.

### References

1. <http://www.cdc.gov/HealthyYouth/yrbs/pdfs/statefacts/wisconsin.pdf> (11/11/04).
2. Munoz KA, et al. *Pediatrics*. 1997; 100(3), 323-349.
3. *Foods Sold in Competition with USDA School Meal Programs: A Report to Congress*. January 12, 2001.
4. Finkelstein EA, et al. *Obesity Research*. 2004; 12(1), 18-24.
5. Horgen KB, et al. *Health Psychology*. 2002; 21(5), 505-512.
6. Hannan P, et al. *Am. J. of Health Promotion*. 2002; 17(1), 1-6.
7. [http://cspinet.org/nutritionpolicy/policy\\_options.html#school\\_foods](http://cspinet.org/nutritionpolicy/policy_options.html#school_foods) (11/28/04).
8. <http://www.dpi.state.wi.us/dpi/dlsea/sspw/pdf/02shep.pdf> (11/11/04).
9. [http://www.wisinfo.com/postrescent/news/archive/local\\_18914488.shtml](http://www.wisinfo.com/postrescent/news/archive/local_18914488.shtml) (12/6/04).
10. Kramer-Atwood JL, et al. *J. of the Am. Dietetic Assn*. 2002; 102(9), 1228-33.
11. [http://www.preventioninstitute.org/sa/enactpriorities\\_S\\_4b.html](http://www.preventioninstitute.org/sa/enactpriorities_S_4b.html) (11/29/04).
12. [http://www.fns.usda.gov/end/Lunch/CompetitiveFoods/state\\_policies\\_2002.htm](http://www.fns.usda.gov/end/Lunch/CompetitiveFoods/state_policies_2002.htm) (11/29/04).
13. [http://cspinet.org/new/pdf/school\\_vending\\_machine\\_case\\_studies.pdf](http://cspinet.org/new/pdf/school_vending_machine_case_studies.pdf) (12/2/04).
14. <http://www.fns.usda.gov/cnd/menu/fmnv.htm> (11/28/04).
15. <http://cspinet.org/new/200405111.html> (12/15/04).