



Under Pressure

Strategies for Sodium Reduction in the School Environment

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Under Pressure: Strategies for Sodium Reduction in the School Environment



Children's Health: What's Sodium Got to Do with It?

Excessive sodium intake increases blood pressure. Data show that sodium reduction lowers blood pressure in children and, if sustained over time, translates to reduced blood pressure in adults.³

High blood pressure is a leading risk factor for cardiovascular diseases, including heart disease, stroke, and other vascular diseases. These are leading causes of death in the United States. Because more than 90 percent

of U.S. adults who reach middle age will develop high blood pressure in their lifetime,⁴ most children, even those with blood pressure in the normal range, are still at high risk of high blood pressure as adults. Because high blood pressure is a leading risk factor for cardiovascular disease, preventing the gradual rise in blood pressure during childhood and adolescence through dietary interventions such as sodium reduction could result in substantial health benefits as children enter adulthood.³

Sodium and the School Environment

The school environment can have a major impact on the diet of school-aged children in the United States. A recent study of school meals found that the average sodium content of school meals was nearly double the recommended amount.¹ In addition, many competitive foods in the school setting are snack foods and beverages that are calorie dense and nutrient poor, and they contain high levels of fat, sugar, and sodium.² High sodium exposure at school can lead to increased consumption of salt, thereby increasing children's risk of high blood pressure, heart disease, and stroke. Efforts are needed to reduce sodium in the school setting. Because schools are settings in which children eat snacks and meals and also learn about health and eating habits, they are ideal settings to offer access to and knowledge about healthful foods as well as opportunities to practice healthy eating habits. Also, school districts can be large employers, thus extending the benefits of healthful eating to the workplace.

The Impact of the School Food Environment on Preference for Sodium

Taste preference for sodium is learned, influenced by exposure to salt; research shows no indication that salty substances are preferred at birth.⁵ Because, on the basis of available evidence, sodium preferences in infants and children appear to be shaped by dietary exposure to sodium,^{6,7} limiting sodium exposure in the school environment can decrease children's preference for salty foods during childhood and as they age.

School Food Environment and Sodium Exposure

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) alone affect nearly every public school in the country on a typical day. In 2009, more than 31 million children participated in NSLP each day,⁸ and more than 11 million children participated in SBP each day.⁹ With the passage of the Healthy Meals for Healthy Americans Act of 1994, schools participating in NSLP and SBP are required to serve meals consistent with the *Dietary Guidelines for Americans*. In 1995, the U.S. Department of Agriculture (USDA) implemented the School Meals Initiative for Healthy Children (SMI),¹⁰ formalizing standards for select nutrients and encouraging a reduction of some nutrients, including sodium. A 2009 study compared levels of sodium in school meals to 2005 Dietary Guidelines recommendations by dividing sodium recommendations for the full day by three or four, assuming goals of one third of the daily recommendation for sodium at lunch and one fourth at breakfast. The study found the average sodium content of lunches offered to children was 1,442 mg, double the recommended level of 767 mg¹ and almost equivalent to the adequate intake recommendation for a full day's sodium consumption of 1,500 mg.¹¹ The study also found that breakfast in most schools tended to be high in sodium, with nearly half of elementary schools serving breakfasts with more than the recommended amount of sodium for one meal

(575 mg) and more than three-fourths of high school breakfasts containing sodium above this level.¹

The school environment has the potential to change students' preferences for sodium and their sodium intake. In 2011, USDA issued a proposed rule, *Nutrition Standards in the National School Lunch and School Breakfast Programs*, outlining benchmarks for sodium reduction in school meals that schools must meet by 2020. The proposed rule was released in response to the Healthy, Hunger-Free Kids Act of 2010 requiring updates to meal patterns and nutrition standards for NSLP and SBP. USDA based the proposed standards on recommendations in the Institute of Medicine (IOM) report *School Meals: Building Blocks for Healthy Children*.¹² The Healthy, Hunger-Free Kids Act also requires the establishment of science-based nutrition standards for foods sold in schools outside the school meals program (i.e., competitive foods).

Efforts to reduce sodium in the school environment can go well beyond school meals and should consider the whole school environment. Importantly, students' overall nutritional status is essential to healthy growth and development. Some strategies used to reduce sodium also could be applied to other aspects of the school food environment, including other nutrients. A range of strategies to support sodium reduction in the school environment follow.



Strategies for Sodium Reduction in the School Environment

► **Modify the Built Environment.**

The built environment can have a substantial impact on the food choices children make and the types of food they come to prefer. School cafeterias can be modified to make healthier, lower sodium options more prominent, increasing the chances that they will be chosen by students. Placing lower sodium items such as fruit at and around the point of purchase also can affect purchasing behavior. When assessing your school's food environment consider:

- Signage and descriptors that are age appropriate and fun or creative. These descriptors may be used to highlight nutrient-rich, lower sodium food choices available in the cafeteria.
- Involving students. This approach could include asking for volunteers to help design artwork that can be painted on the cafeteria walls or allowing students to provide input on new options by conducting taste tests.
- Engaging food service staff, such as offering professional development training for food service staff on lower sodium cooking techniques. The National Food Service Management Institute, USDA Team Nutrition, and School Nutrition Association have resources relevant to this strategy.

► **Incorporate Nutrition Education into Health Education for Students.**

Incorporating sodium education into required course curriculum in health and related classes will ensure that students are educated on the negative health effects of excess sodium. Other sodium-related health education strategies include:

- Requiring the school nurse to distribute sodium information when taking students' blood pressure.
- Providing sodium education and training to school personnel, including health and physical activity teachers and school nurses.
- Providing nutritional information in and around the school cafeteria (i.e., on table tents, signage, menu labeling).
- Offering educational materials for parents about the impact of sodium on blood pressure.
- Educating students, teachers, and parents about the hidden sources of sodium (i.e., not just foods traditionally regarded as salty but also everyday foods like bread and cereal because they are frequently consumed).
- Offering cooking classes in the evenings for parents and students.
- Incorporating nutritional information, including sodium, into the school newsletter.

Case Example:

Creating Change in the School Food Environment
<http://www.healthyschoolfood.org/projects.htm>

“...Evidence has documented that as sodium intake decreases, so does blood pressure in children, birth to 18 years of age.”

—2010 Dietary Guidelines Advisory Committee Report

► **Implement Nutrient Standards for Competitive Foods Served at School.**

In addition to providing food through meal programs, most schools offer a la carte services in snack bars; from student stores; in vending machines; or at school activities, such as fundraisers, achievement ceremonies, classroom parties, school celebrations, and school meetings.¹³ The IOM defines competitive foods as foods and beverages that are sold, served, or given to students in the school environment other than meals served through NSLP, SBP, and After-School Snack and Meal Programs. In addition, some schools have policies that allow the sale of food from commercial food establishments on the school campus. Food obtained from these sources is considered competitive food because it competes with meal programs. In school year 2004–2005, 40 percent of children consumed one or more competitive foods each day, and these foods were typically low in nutrients and calorie dense.¹³ A 2007 IOM report *Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth* recommended nutrient standards for competitive foods, including that snack items meet a sodium content limit of 200 mg or less per portion as packaged or 480 mg or less per entrée portion as served. Nutrition requirements for competitive foods could include:

- Further limits for certain nutrients, including sodium, in competitive foods.
- Pricing strategies to provide more healthful options at a lower cost.
- Placement strategies regarding locations of vending and a la carte items on school campuses.
- Standards for outside vendors allowed to operate in school cafeterias (i.e., fast food establishments).
- Group purchasing with other school districts to obtain lower sodium items at a lower cost.
- Inclusion of nutrition standards as a component to accept or reject a vending bid.

► **Implement Nutrient Standards for School Meals.**

The IOM's *School Meals: Building Blocks for Healthy Children* report recommends that by 2020, schools should strive to reduce sodium to 1,240 mg per day in breakfast and lunch foods. School districts may choose to set nutrient standards for foods served to students and thus allow school meals to be more healthful. Although the IOM has recommended these standards, schools may still go above and beyond the basic requirements. Nutrition standards could include:

- Limits for certain nutrients, including sodium, in foods served on school campuses.
- Group purchasing with other school districts to obtain lower sodium items at a lower cost.
- Inclusion of nutrition standards as a component to accept or reject a bid for food service.
- Taste-tests for reformulated standardized recipes to assess acceptance by students.
- Placement of food procurement standards as a “consent calendar” item to be voted on (if your district has a consent calendar).
- Use of USDA Foods (commodities), which have been modified to reduce sodium, fat, and saturated fat, when substituting ingredients for healthier options.

Case Example:

Improving School Foods Without Losing Revenue
http://www.cspinet.org/nutritionpolicy/improved_school_foods_without_losing_revenue2.pdf



► **Utilize Community Partners.**

Parents and teachers aren't the only people who care about children's health. Stakeholders could participate in letter writing campaigns and other strategies to support sodium reduction and the availability of more healthful foods, improved zoning to ban unhealthful vendors from operating on and around school campuses, or assessing liability issues related to serving foods with high sodium to students. Assessing and networking with outside stakeholders who would benefit from or have an interest in improving the school food environment will build support for proposed strategies. Stakeholders may include:

- Parent-teacher organizations.
- Local health care associations, such as school nutrition or nurses associations (some members likely have children in your district and may be willing to volunteer their time).
- Media.
- Students.
- Local YMCAs and community organizations, such as the Boys and Girls Club.

Case Example:

Creating A Healthy Food Zone Around Schools
http://www.nplanonline.org/sites/phlpnet.org/files/nplan/HealthyFoodZone_FactSht_FINAL_091008.pdf

► **Promote Healthier Options with Marketing and Incentives.**

Lower sodium foods may be promoted with savory descriptors on menu boards and serving lines. Item pricing could affect purchases, especially if lower sodium items are cheaper than items with greater amounts of sodium. Advertising for unhealthful foods may be restricted as well.

Case Example:

Restricting Food and Beverage Advertising in Schools
<http://www.nplanonline.org/nplan/products/restricting-food-and-beverage-advertising-schools>

► **Innovate.**

The opportunities to reduce sodium and improve the school food environment are endless. Tactics that have worked for some school districts may not work for everyone. When working to reduce sodium and offer more healthful choices, consider what will work for your specific school or district. The examples listed in this guide are just some of the many things that can be done to improve the school environment and the health of our nation's students. Please see the following section for related resources.

A 2007 IOM report *Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth* recommended nutrient standards for competitive foods, including that snack items meet a sodium content limit of 200 mg or less per portion as packaged or 480 mg or less per entrée portion as served.

Resources

Action for Healthy Kids

www.actionforhealthykids.org

Alliance for a Healthier Generation—
Healthier Schools Program

www.healthiergeneration.org/schools.aspx

Center for Science in the Public Interest—
School Foods Toolkit

www.cspinet.org/schoolfoodkit

CDC Division of Adolescent and School Health—
Adolescent and School Health Tools

www.cdc.gov/healthyyouth/SchoolHealth/tools.htm

www.cdc.gov/healthyyouth/nutrition/standards.htm

Fuel Up to Play 60

<http://school.fueluptoplay60.com>

Let's Move Salad Bars to Schools

<http://saladbars2schools.org>

National Food Service Management Institute

www.nfsmi.org

National Policy and Legal Analysis Network to Prevent
Childhood Obesity—Success Stories

www.nplanonline.org/nplan/success-stories

School Nutrition Association

www.schoolnutrition.org

USDA Healthier U.S. Schools Challenge

www.fns.usda.gov/tn/healthierus

USDA Team Nutrition

www.fns.usda.gov/tn



References

1. Crepinsek M, Gordon A, McKinney P, Condon E, Wilson A. Meals offered and served in U.S. public schools: do they meet nutrient standards? *J Am Diet Assoc.* 2009;109:S31–43.
2. Institute of Medicine. Nutrition standards for foods in schools: leading the way toward healthier youth. Washington, DC: National Academies Press; 2007.
3. U.S. Department of Health and Human Services, U.S. Department of Agriculture. Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010. Part D. Section 6: Sodium, Potassium, and Water. Available at www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/DGAC/Report/D-6-SodiumPotassiumWater.pdf.
4. Vasan RS, Beiser A, Seshadri S, Larson MG, Kannel WB, D'Agostino RB, et al. Residual lifetime risk for developing hypertension in middle-aged women and men: the Framingham Heart Study. *JAMA.* 2002;287:1003–10.
5. Beauchamp GK, Cowart BJ, Moran M. Developmental changes in salt acceptability in human infants. *Dev Psychobiol.* 1986;19:17–25.
6. Beauchamp GK, Bertino M, Burke D, Engelman K. Experimental sodium depletion and salt taste in normal human volunteers. *Am J Clin Nutr.* 1990;51:881–9.
7. Stein LJ, Cowart BJ, Epstein AN, Pilot LJ, Laskin CR, Beauchamp GK. Increased liking for salty foods in adolescents exposed during infancy to a chloride-deficient feeding formula. *Appetite.* 1996;27:65–77.
8. National School Lunch Program: Participation and lunches served. U.S. Department of Agriculture, Food and Nutrition Service Web site. Available at www.fns.usda.gov/pd/slsummar.htm.
9. School Breakfast Program: Participation and breakfasts served. U.S. Department of Agriculture, Food and Nutrition Service Web site. Available at www.fns.usda.gov/pd/sbsummar.htm.
10. Office of the Federal Register, National Archives and Records Administration. National School Lunch Program and School Breakfast Program: School Meals Initiative for Healthy Children. Final Rule. 60 *Federal Register* 31188–31222 (1995) (Codified at 7 CFR §210 and 220).
11. Institute of Medicine. *Dietary reference intakes for water, potassium, sodium, chloride, and sulfate.* Washington, DC: National Academies Press; 2005.
12. Institute of Medicine. *School meals: building blocks for healthy children.* Washington, DC: National Academies Press; 2010.
13. Fox M, Gordon A, Nogales R, Wilson A. Availability and consumption of competitive foods in U.S. public schools. *J Am Diet Assoc.* 2009;109(2):S57–66.



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