



FACTS

Salt

Reducing Sodium in the Diets of American Children

OVERVIEW

Around 90% school-age children in the United States consume more sodium than recommended.¹ High blood pressure was once generally considered to be an illness that affected mainly middle-aged and older individuals. However, due to lifestyle changes over the



past 30 years, there has been an increase in the rates of obesity and type 2 diabetes among adolescents as well as an increase in the average blood pressure level and prevalence of hypertension in children and

adolescents.² High blood pressure is a major risk factor for cardiovascular disease, which is the leading cause of death in the United States.³ High blood pressure can also increase the risk for stroke, osteoporosis, stomach cancer, and kidney disease.⁴ Importantly, studies suggest that infants' and children's preference for the taste of sodium is formed by dietary exposure, meaning the less sodium children consume, the less they want.^{5,6}

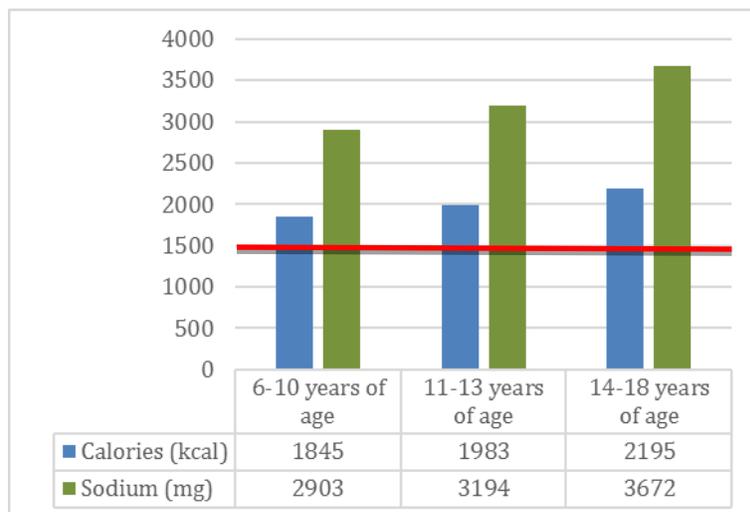
The American Heart Association advocates for a stepwise reduction in sodium consumption in the U.S. diet for children and adults by 2020. This, combined with a nutritious diet that relies on fruits and vegetables, whole grains, low-fat and nonfat dairy products, beans, fish, and lean meats could help to improve the health of this generation of Americans.⁷

THE CURRENT STATE OF AFFAIRS

- Children currently consume most of their salt in ten common food types: pizza, breads, cold cuts, savory snacks, sandwiches, cheese, poultry, mixed pasta dishes, Mexican dishes, and soups. These foods account for nearly 43% of sodium eaten by children.⁸
- The Healthy, Hunger-Free Kids Act of 2010 mandated a gradual, 12 year reduction to align sodium levels in school meals with the Dietary Guidelines. The first phase has already been implemented and schools have until the 2022 school year to meet the recommended amounts.⁹ Children ages 6-18 years old consume an average of nearly 3,300 mg/day of sodium each



day and much of the sodium in foods even before salt is added at the table.¹ Boys tend to consume more sodium than girls and children between the ages of 14 and 18 typically consume more than 3,600 mg of sodium per day.¹⁰



Adapted from: Cogswell, ME, Yuan, K, Gunn, JP, Gillespie, C, Sliwa, S, Galuska, DA., ... & Bowman, BA. (2014). Vital signs: sodium intake among US school-aged children—2009–2010. *Morbidity and Mortality Weekly Report*, 63(36), 789-797.

— Represents the association's recommendation of less than 1,500mg/sodium/day.

- The Institute of Medicine has established a sodium intake upper limit of 1,900 mg for children aged 4-8; 2,200 mg for children 9-13; and 2,300 mg for children 14-18.¹¹ On average, children eat more than 3,200 mg of sodium daily.⁸
- One in six children has elevated blood pressure.¹²
- Analysis of data from the Search for Diabetes in Youth Study found that the prevalence of elevated blood pressure among those with type 1 diabetes was 5.9% and the prevalence of elevated blood pressure among those with type 2 diabetes was 23.7%.¹³
- Non-Hispanic black children and Mexican-American children generally have a greater prevalence of high blood pressure and pre-hypertension than non-Hispanic white children, and the prevalence is greater in boys than in girls.³

- Children’s salt preference is influenced by their eating habits and food marketing.¹⁴ Their preference for salt may be established at a young age.¹⁵
- The positive effect of sodium reduction on blood pressure in children can be seen as early as infancy.⁴



THE POPULATION AT RISK

The proportion of obese adolescents with pre-hypertension and hypertension combined is nearly 30%.¹⁶ A study estimated that up to 74% of hypertensive children are not diagnosed with the condition.¹⁷ Studies have shown that children with high blood pressure show signs of enlargement of the left ventricle in the heart and thickening of the arteries and diastolic dysfunction.¹⁸ Additionally, hypertension in childhood is correlated with high blood pressure in adulthood.¹⁹

ECONOMIC AND HEALTH BENEFITS

The total direct and indirect cost of cardiovascular diseases are estimated to be over \$320 billion a year, with hypertension alone costing \$46.4 billion.⁵ A 9.5% drop in sodium intake would likely result in nearly one million fewer cardiac events a year; a savings of over \$32 billion.²⁰ A reduction in hypertension in children today could result in longer, healthier lives and may lower hospitalization costs in the future.

THE ASSOCIATION ADVOCATES

The opportunity to address lower sodium levels for children can be found in a broad range of initiatives. The American Heart Association will:

- Protect and support implementation of the evidence-based sodium standards for school meals and Smart Snacks.
- Support procurement standards for foods purchased by government agencies and employers that include criteria for strict sodium limits.
- Advocate for increasing availability of fruits and vegetables in schools through commodities, food purchasing, school gardens, the Fresh Fruit and Vegetable Program, and the fruit and vegetable standards in school meals.
- Support improving access to and affordability of fruits and vegetables in the community by providing various incentives. Examples include: incentives for small and mid-size farms to produce specialty crops that can be distributed locally and regionally; the Farmers' Market Promotion Program, which fosters community-led approaches to improve consumer access to healthy and fresh foods in low income neighborhoods; the Healthy Food Financing

Initiative, which helps bring grocery stores into food deserts and low-income communities; and incentives in the Supplemental Nutrition Assistance Program (SNAP) which promote the purchase of healthy foods, especially fruits, vegetables, and high-fiber, whole grains.

- Advocate for other privately or publicly funded initiatives that support the purchase of healthy foods such as Double Up Food Bucks²¹ and Wholesome Wave.²²
- Support efforts by food manufacturers, restaurants, and other foodservice companies to reduce sodium in their products and support the Food and Drug Administration’s efforts to issue voluntary recommendations for the sodium content of foods.

¹ Centers for Disease Control and Prevention. (2013). Trends in the prevalence of excess dietary sodium intake-United States, 2003-2010. *Morbidity and Mortality Weekly Report*, 62(50), 1021.

² Lloyd-Jones, DM, Hong, Y, Labarthe, D, Mozaffarian, D, Appel, LJ, Van Horn, L, ... & Rosamond, WD. (2010). Defining and setting national goals for cardiovascular health promotion and disease reduction the American Heart Association’s Strategic Impact Goal through 2020 and beyond. *Circulation*, 121(4), 586-613.

³ Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, ... & Turner MB; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. (2014). Heart disease and stroke statistics—2015 update: A report from the American Heart Association. *Circulation* 2015, 131, e01–e294.

⁴ Appel, LJ, Frohlich, ED, Hall, JE, Pearson, TA, Sacco, RL, Seals, DR, ... & Van Horn, LV. (2011). The importance of population-wide sodium reduction as a means to prevent cardiovascular disease and stroke a call to action from the American Heart Association. *Circulation*, 123(10), 1138-1143.

⁵ Stein, LJ, Cowart, BJ, & Beauchamp, GK. (2012). The development of salty taste acceptance is related to dietary experience in human infants: A prospective study. *The American Journal of Clinical Nutrition*, 95(1), 123-129.

⁶ Menella, JA, Finkbeiner, S, Lipchock, SV, Hwang, LD, & Reed, DR. (2014). Preferences for salty and sweet tastes are elevated and related to each other during childhood. *Public Library of Science One*, 9(3), e92201.

⁷ Gidding, SS, Dennison, BA, Birch, LL, Daniels, SR, Gilman, MW, Lichtenstein, AH, ... & Van Horn, L. (2005). Dietary recommendations for children and adolescents a guide for practitioners: Consensus statement from the American Heart Association. *Circulation*, 112(13), 2061-2075.

⁸ Cogswell, ME, Yuan, K, Gunn, JP, Gillespie, C, Sliwa, S, Galuska, DA, ... & Bowman, BA. (2014). Vital signs: sodium intake among US school-aged children—2009–2010. *Morbidity and Mortality Weekly Report*, 63(36), 789-797.

⁹ Department of Agriculture. (2012). *Nutrition standards in the National School Lunch and School Breakfast Programs; Final Rule (7 CFR Parts 210 and 220)*. Washington, DC: US Government Printing Office.

¹⁰ Food Surveys Research Group. (2011). Sodium Intake in the US Population. Retrieved from http://www.ars.usda.gov/sp2userfiles/place/80400530/pdf/dbrief/sodium_intake_0708.pdf. Accessed date February 2015.

¹¹ Yaktine, AL, Oria, M, & Strom, BL (Eds.). (2013). *Sodium intake in populations: Assessment of evidence*. National Academies Press.

¹² Rosner, B, Cook, NR, Daniels, S, & Falkner, B. (2013). Childhood blood pressure trends and risk factors for high blood pressure: The NHANES experience 1988–2008. *Hypertension*, 62(2), 247-254.

¹³ Rodriguez, BL, Dabelea, D, Liese, AD, Fujimoto, W, Waitzfelder, B, Liu, L, ... & SEARCH Study Group. (2010). Prevalence and correlates of elevated blood pressure in youth with diabetes mellitus: the Search for Diabetes in Youth Study. *The Journal of Pediatrics*, 157(2), 245-251.

¹⁴ Cornwell, TB, & McAlister, AR. (2011). Alternative thinking about starting points of obesity. Development of child taste preferences. *Appetite*, 56(2), 428-439.

¹⁵ Stein, LJ, Cowart, BJ, & Beauchamp, GK. (2012). The development of salty taste acceptance is related to dietary experience in human infants: a prospective study. *The American Journal of Clinical Nutrition*, 95(1), 123-129.

¹⁶ McNiece, KL, Poffenbarger, TS, Turner, JL, Franco, KD, Sorof, JM, & Portman, RJ. (2007). Prevalence of hypertension and pre-hypertension among adolescents. *The Journal of Pediatrics*, 150(6), 640-644.

¹⁷ Hansen, ML, Gunn, PW, & Kaelber, DC. (2007). Underdiagnosis of hypertension in children and adolescents. *Journal of the American Medical Association*, 298(8), 874-879.

¹⁸ Litwin, M, Niemirska, A, Sładowska, J, Antoniewicz, J, Daszkowska, J, Wierzbicka, A, ... & Grenda, R. (2006). Left ventricular hypertrophy and arterial wall thickening in children with essential hypertension. *Pediatric Nephrology*, 21(6), 811-819.

¹⁹ Lauer, R. M., & Clarke, W. R. (1989). Childhood risk factors for high adult blood pressure: the Muscatine Study. *Pediatrics*, 84(4), 633-641.

²⁰ Smith-Spangler, CM, Juusola, JL, Enns, EA, Owens, DK, & Garber, AM. (2010). Population strategies to decrease sodium intake and the burden of cardiovascular disease: a cost-effectiveness analysis. *Annals of Internal Medicine*, 152(8), 481-487.

²¹ Double Up Food Bucks. (2015). Retrieved from <http://doubleupfoodbucks.org/>. Accessed March 2015.

²² Wholesome Wave. (2014). Retrieved from <https://www.wholesomewave.org/>. Accessed March 2015.