

Energy Balance

What is the energy balance?

Energy balance is the relationship between how many calories we consume through foods and beverages (energy in), and how many calories we burn through physical activity and daily living (energy out). If we consume the same amount of energy we expend, our weight stays the same. Over time, more energy in than out leads to weight gain, while the opposite leads to weight loss.¹

How well we manage the balance between eating and physical activity strongly influences our overall health and our chances of developing obesity.

Many factors influence what we eat and how much exercise we get. For example, if we have easy access to healthy foods, we are more likely to eat them. If we have easy access to parks, playgrounds and other safe places to exercise, we are more likely to be physically active.

Why is energy balance important for children's health?

Children who eat too many high-calorie foods (energy in) and don't get enough physical activity (energy out) face a higher risk of becoming obese.² Nearly one third of children in the U.S. are overweight or obese.³ These children are developing diseases that we used to see only in adults such as type 2 diabetes and high blood pressure. They also face a greater risk of developing heart disease, cancer, and other serious chronic conditions.^{4,5} As a result, they may live shorter, sicker lives than their parents.⁶ Ensuring the proper energy balance in our children is a critical part of preventing and reducing childhood obesity and the accompanying high economic and social costs.

Too much energy in—What are children eating and drinking?

Research shows that children's eating habits are harming their health. One of the biggest culprits is sugary drinks. Good scientific studies have shown that consuming sugar-sweetened beverages increases obesity and risk for diabetes.⁷ Aggressive marketing campaigns aimed at children cause them to drink more sugary products.

- Among middle-school aged children, one study showed the odds of their becoming obese increased by 60 percent for every additional serving of sugar-sweetened beverages per day.⁸
- Children and adolescents now derive 10 to 15 percent of their total calories from sugar-sweetened beverages and 100 percent fruit juice.⁹
- Children who habitually consume sugar-sweetened beverages may find healthier foods (e.g., fruits and vegetables) unappealing, with the result that their diets may be of poor quality.⁷
- The food industry spends more than \$1.6 billion per year in the U.S. on marketing to children. The overwhelming majority of these ads are for unhealthy products high in calories, sugar, or sodium.¹⁰



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Too little energy out—Are children active enough?

Children and adolescents are less physically active than they were a generation ago. In 1969, 42 percent of children walked or biked to school, compared with only 13 percent by 2001.¹¹ Traffic dangers, neighborhoods lacking sidewalks, and urban sprawl have all contributed to this decline. Shrinking educational budgets and competing academic pressures have caused many schools to reduce or eliminate recess and physical education, depriving students of exercise and opportunities to learn about the role of physical activity in being healthy.

- Only 3.8 percent of elementary schools, 7.9 percent of middle schools and 2.1 percent of high schools provided daily physical education or its equivalent for the entire school year in 2006. Nationally, 22 percent of schools did not require students to take any physical education at all.¹²
- Of children ages 9 to 13 years, 62 percent do not participate in any organized physical activity and 23 percent do not engage in any free-time physical activity outside of school hours.¹³
- Schools are increasingly located away from where students live, requiring students to travel farther and making it difficult, if not impossible, for children to walk or bicycle to school.¹⁴

The health–environment link

The latest research indicates that the environments where children live, learn, and play have a substantial affect on the foods they eat and the amount of activity they get.¹⁵ Many children in low-income and rural communities are growing up in landscapes dominated by strips of fast-food and convenience stores, where fresh fruits and vegetables are unfamiliar rarities their parents can't afford. In some communities, parents cannot provide their children with healthy foods because they don't have access to quality, full-service supermarkets. Low-income areas have access to half as many supermarkets as wealthy areas.¹⁶

Family farms have declined as a source of physical activity for children in rural areas, but parks, playgrounds and bike paths have not been developed in their place to encourage alternative forms of exercise. Children can't walk or bike to school because it's too far away.

Such isolated environments prevent children from developing healthy behaviors that keep the energy balance in check. These children suffer from higher rates of obesity than children in more affluent neighborhoods with better access to healthy food and places to exercise safely.¹⁷

Restoring the energy balance to reverse the epidemic of childhood obesity

To reverse the childhood obesity epidemic, we must help children balance the energy they consume through foods and drinks with the energy they're burning each day. This means making changes to children's environments, especially in communities where there are high numbers of obese children. One of the most effective ways to accomplish this is through public policies that provide all children, including those from low-income communities and communities of color, with access to nutritious, affordable food and opportunities for safe physical activity. Examples of policies that could help improve children's environments¹⁸ include the following.

- Create incentive programs to encourage the establishment of retail grocery stores in underserved areas, improve food offerings in corner and convenience stores, and start and sustain farmers' markets.
- Mandate and implement strong nutrition standards for all foods and beverages available on school campuses during the school day, including foods sold outside the federal school meal programs.
- Build and maintain parks and playgrounds that are safe and attractive for playing and are near residential areas. Establish agreements that allow school facilities to be used by community residents outside of school hours.

- Connect roadways to a system of trails and bike paths that enable safe walking and biking, and support the development of bike paths, sidewalks and other infrastructure to enable children to walk or bike to school through the [Safe Routes to School](#) program.
- Develop and implement measures that limit the marketing of unhealthy products to children.

For more on strategies to end childhood obesity, please visit www.reversechildhoodobesity.org.

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ACHI is a nonpartisan, independent health policy center based in Little Rock. The organization was instrumental in developing and implementing Arkansas Act 1220 of 2003, one of the nation's first successful statewide obesity-prevention programs. PolicyLink is a research and action institute that advances economic and social equity, and is well known nationally for its leadership and advocacy to improve health and well-being especially in low-income communities and communities of color.

¹ "Balance Food and Activity," U.S. Department of Health and Human Services. We Can!,

<http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/healthy-weight-basics/balance.htm> (accessed April 21, 2010)

² Koplan, Jeffrey P., Catharyn T. Liverman and Vivica A. Kraak, eds. 2005. *Preventing Childhood Obesity: Health in the Balance*. (Washington D.C.: Institute of Medicine, The National Academies Press).

³ Ogden, Cynthia L., Margaret D. Carroll, Lester R. Curtin, Molly M. Lamb, and Katherine M. Flegal. "Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008." *Journal of the American Medical Association* 303 (3) (January 2010): 242-249.

⁴ "Childhood Overweight and Obesity," Centers for Disease Control and Prevention, <http://www.cdc.gov/obesity/childhood/index.html> (accessed April 21, 2010)

⁵ "Overweight and Obesity: Health Consequences," Centers for Disease Control and Prevention, 2009, <http://www.cdc.gov/obesity/causes/health.html> (accessed April 21, 2010)

⁶ Olshansky, S. Jay, Ph.D., Douglas J. Passaro, M.D., Ronald C. Hershow, M.D., Jennifer Layden, M.P.H., Bruce A. Carnes, Ph.D., Jacob Brody, M.D., Leonard Hayflick, Ph.D., Robert N. Butler, M.D., David B. Allison, Ph.D., and David S. Ludwig, M.D., Ph.D. January 2010. "A Potential Decline in Life Expectancy in the United States in the 21st Century." *New England Journal of Medicine* 352(11) (January 2010): 1138-1145.

⁷ Brownell, Kelly D., Ph.D., Thomas Farley, M.D., M.P.H., Walter C. Willett, M.D., Dr.P.H., Barry M. Popkin, Ph.D., Frank J. Chaloupka, Ph.D., Joseph W. Thompson, M.D., M.P.H., and David S. Ludwig, M.D., Ph.D. "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages." *New England Journal of Medicine* 361 (October 15, 2009): 1599-1605.

⁸ Ludwig, D.S., K.E. Peterson, and S.L. Gortmaker. "Relation between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis." *Lancet* 357 (2001): 505-508.

⁹ Wang, Y. Claire, Sara N. Bleich and Steven L. Gortmaker. "Increasing caloric contribution from sugar-sweetened beverages and 100% fruit juices among US children and adolescents, 1988-2004." *Pediatrics* 121(6):e (June 2008): 1601-14.

¹⁰ Harris, Jennifer L., Jennifer L. Pomeranz, Tim Lobstein, and Kelly D. Brownell. "A Crisis in the Marketplace: How Food Marketing Contributes to Childhood Obesity and What Can Be Done." *Annual Review of Public Health* 30 (2009): 211-25.

¹¹ McMillan, Tracy E. May 2009. Walking and Biking to School, Physical Activity and Health Outcomes [Research Brief]. Active Living Research, http://www.activelivingresearch.org/files/ALR_Brief_ActiveTransport.pdf (accessed April 21, 2010)

¹² Kann, Laura, Nancy D. Brener, and Howell Wechsler. "Overview and Summary: School Health Policies and Programs Study 2006." *Journal of School Health* Volume 77, Number 8 (October 2007): 385-397.

¹³ "Health Risks: Insufficient Physical Activity," Safe Routes to School Guide, http://www.saferoutesinfo.org/guide/introduction/health_risks.cfm (accessed April 21, 2010)

¹⁴ "The Decline of Walking and Bicycling," Safe Routes to School Guide, http://www.saferoutesinfo.org/guide/introduction/the_decline_of_walking_and_bicycling.cfm (accessed April 21, 2010)

¹⁵ California Center for Public Health Advocacy, PolicyLink, and the UCLA Center for Health Policy Research, "Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes," (2008), <http://www.healthpolicy.ucla.edu/pubs/Publication.aspx?pubID=250> (accessed April 21, 2010)

¹⁶ Moore, Latetia V., and Ana V. Diez Roux. "Association of Neighborhood Characteristics with the Location and Type of Food Stores." *American Journal of Public Health* 96(2) (February 2006): 325-331.

¹⁷ Convergence Partnership (2008). *Strategies for Enhancing the Built Environment to Support Healthy Eating and Active Living*. Retrieved from http://www.kintera.org/atf/cf/%7B245A9B44-6DED-4ABD-A392-AE583809E350%7D/CP_Built%20Environment_printed.pdf

¹⁸ "Policy Strategies," Robert Wood Johnson Foundation Center to Prevent Childhood Obesity, February 2010, <http://www.reversechildhoodobesity.org/content/policy-strategies> (accessed April 21, 2010)