

FUEL UP FOR HEALTH



Breakfast is a healthy start to a day for everyone. It is especially important for children. Research shows that not only does school breakfast make a difference for health but learning too.

School breakfast participation improves children's nutrition.

- School breakfast participants are more likely to consume diets that are adequate or exceed standards for important vitamins and minerals (e.g., vitamin C, vitamin A, calcium, phosphorous).^{1,2,3}
- Children and adolescents who skip breakfast tend to have poorer nutrient intakes than those who eat breakfast.^{4,5,6}
- Eating breakfast regularly has been linked with greater intake of fiber, calcium, iron, vitamin C, and other vitamins and minerals, and lower intake of fat, cholesterol, and sodium.^{7,8}
- Children who participate in school breakfast are more likely to consume fruit and milk at breakfast.⁹



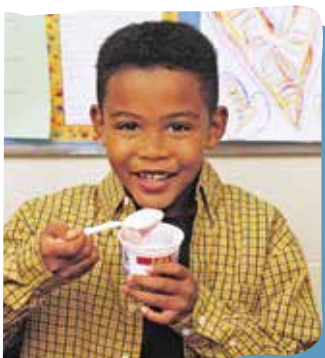
School breakfast may protect against childhood obesity.

- School breakfast participation is associated with a lower body mass index (BMI, an indicator of excess body fat), lower probability of overweight, and lower probability of obesity.^{10,11}
- Participation in federally funded meals in child care, preschool, school, or summer settings is associated with a lower BMI among young, low-income children.¹²
- Children and adolescents who eat breakfast have more favorable weight-related outcomes (e.g., lower BMI, lower waist circumference, lesser likelihood of being chronically obese) in the short term and long term than those who skip breakfast.^{13,14,15,16,17,18,19}



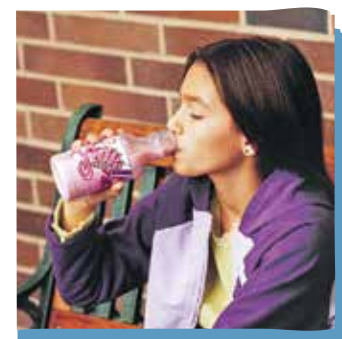
School breakfast participation protects against other negative health concerns.

- Breakfast skipping among children and adolescents is associated with a number of poor health outcomes and health-compromising behaviors, including higher blood cholesterol and insulin levels, smoking, alcohol use, physical inactivity, disordered eating, and unhealthy weight management practices.^{20,21,22,23}
- School breakfast, including breakfast offered free to all students, has been linked with fewer visits to the school nurse, particularly in the morning.²⁴
- School breakfast participation, especially breakfast offered free to all students, positively impacts children's mental health, including reductions in behavioral problems, anxiety, and depression.^{25,26}

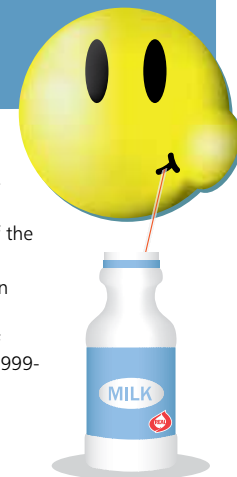


Breakfast in the classroom programs† and programs offering breakfast free to all children in the cafeteria yield other positive results for health and learning.

- Students attending schools that offer a breakfast free to all students are more likely to consume a nutritionally substantive breakfast and to consume significantly more calcium, magnesium, phosphorus, fruit, and dairy products at breakfast, when compared to students from schools with a traditional means-tested school breakfast in the cafeteria program.²⁷
- Children who increase their school breakfast participation as a result of a school breakfast program offered free to all students show improvements in math scores, attendance, punctuality, depression, anxiety, and hyperactivity.²⁸



† Breakfast in the classroom programs are an increasingly popular alternative to traditional before-the-bell, cafeteria-based breakfast programs. Breakfast is brought in from the kitchen in containers that keep dishes at the right temperature, or picked up from carts in the hallways as students enter class. Typically this breakfast is offered free to all students. Such programs boost school breakfast participation and remove the stigma associated with participation.



- 1 Bhattacharya, J., Currie, J., & Haider, S. J. (2006). Breakfast of champions? The School Breakfast Program and the nutrition of children and families. *Journal of Human Resources*, 41(3), 445-466.
- 2 Clark, M. A. & Fox, M. K. (2009). Nutritional quality of the diets of U.S. public school children and the role of the school meal programs. *Journal of the American Dietetic Association*, 109(2 Supplement 1), S44-S56.
- 3 Gleason, P. & Sutor, C. (2001). Children's diets in the mid-1990s: dietary intake and its relationship with school meal participation. Special Nutrition Programs, CN-01-CD1. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation.
- 4 Deshmukh-Taskar, P. R., Nicklas, T. A., O'Neil, C. E., Keast, D. R., Radcliffe, J. D., & Cho, S. (2010). The relationship of breakfast skipping and type of breakfast consumption with nutrient intake and weight status in children and adolescents: the National Health and Nutrition Examination Survey 1999-2006. *Journal of the American Dietetic Association*, 110(6), 869-878.
- 5 Kerver, J. M., Yang, E. J., Obayashi, S., Bianchi, L., & Song, W. O. (2006). Meal and snack patterns are associated with dietary intake of energy and nutrients in US adults. *Journal of the American Dietetic Association*, 106(1), 46-53.
- 6 Rampersaud, G. C., Pereira, M. A., Girard, B. L., Adams, J., & Metz, J. D. (2005). Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*, 105(5), 743-760.
- 7 Affenito, S. G., Thompson, D. R., Barton, B. A., Franko, D. L., Daniels, S. R., Obarzanek, E., Schreiber, G. B., & Striegel-Moore, R. H. (2005). Breakfast consumption by African-American and white adolescent girls correlates positively with calcium and fiber intake and negatively with body mass index. *Journal of the American Dietetic Association*, 105(6), 938-945.
- 8 Kerver et al., 2006. (see endnote #5)
- 9 Condon, E. M., Crepinsek, M. K., & Fox, M. K. (2009). School meals: types of foods offered to and consumed by children at lunch and breakfast. *Journal of the American Dietetic Association*, 109(2 Supplement 1), S67-S78.
- 10 Gleason, P. M. & Dodd, A. H. (2009). School breakfast program but not school lunch program participation is associated with lower body mass index. *Journal of the American Dietetic Association*, 109(2 Supplement 1), S118-S128.
- 11 Millimet, D. L., Tchernis, R., & Husain, M. (2009). School nutrition programs and the incidence of childhood obesity. *Journal of Human Resources*, 45(3), 640-654.
- 12 Kimbro, R. T. & Rigby, E. (2010). Federal food policy and childhood obesity: a solution or part of the problem? *Health Affairs*, 29(3), 411-418.
- 13 Alexander, K. E., Ventura, E. E., Spruijt-Metz, D., Weigensberg, M. J., Goran, M. I., & Davis, J. N. (2009). Association of breakfast skipping with visceral fat and insulin indices in overweight Latino youth. *Obesity*, 17(8), 1528-1533.
- 14 Barton, B. A., Elderidge, A. L., Thompson, D., Affenito, S. G., Striegel-Moore, R. H., Franko, D. L., Albertson, A. M., & Crockett, S. J. (2005). The relationship of breakfast and cereal consumption to nutrient intake and body mass index: the National Heart, Lung, and Blood Institute Growth and Health Study. *Journal of the American Dietetic Association*, 105(9), 1383-1389.
- 15 Deshmukh-Taskar et al., 2010. (see endnote #4)
- 16 Fiore, H., Travis, S., Whalen, A., Auinger, P., & Ryan, S. (2006). Potentially protective factors associated with healthful body mass index in adolescents with obese and nonobese parents: a secondary data analysis of the third national health and nutrition examination survey, 1988-1994. *Journal of the American Dietetic Association*, 106(1), 55-64.
- 17 Merten, M. J., Williams, A. L., & Shriver, L. H. (2009). Breakfast consumption in adolescence and young adulthood: parental presence, community context, and obesity. *Journal of the American Dietetic Association*, 109(8), 1384-1391.
- 18 Niemeier, H. M., Raynor, H. A., Lloyd-Richardson, E. E., Rogers, M. L., & Wing, R. R. (2006). Fast food consumption and breakfast skipping: predictors of weight gain from adolescence to adulthood in a nationally representative sample. *Journal of Adolescent Health*, 39(6), 842-849.
- 19 Timlin, M. T., Pereira, M. A., Story, M., & Neumark-Sztainer, D. (2008). Breakfast eating and weight change in a 5-year prospective analysis of adolescents: Project EAT (Eating Among Teens). *Pediatrics*, 121(3):e638-645.
- 20 Cohen, B., Evers, S., Manske, S., Bercovitz, K., & Edward, H. G. (2003). Smoking, physical activity and breakfast consumption among secondary school students in a southwestern Ontario community. *Canadian Journal of Public Health*, 94(1), 41-44.
- 21 Keski-Rahkonen, A., Kaprio, J., Rissanen, A., Virkkunen, M., & Rose, R. J. (2003). Breakfast skipping and health-compromising behaviors in adolescents and adults. *European Journal of Clinical Nutrition*, 57(7), 842-853.
- 22 Smith, K. J., Gall, S. L., McNaughton, S. A., Blizzard, L., Dwyer, T., & Venn, A. J. (2010). Skipping breakfast: longitudinal associations with cardiometabolic risk factors in the Childhood Determinants of Adult Health Study. *American Journal of Clinical Nutrition*, 92(6), 1316-1325.
- 23 Zullig, K., Ubbes, V. A., Pyle, J., & Valois, R. F. (2006). Self-reported weight perceptions, dieting behavior, and breakfast eating among high school adolescents. *Journal of School Health*, 76(3), 87-92.
- 24 Bernstein, L. S., McLaughlin, J. E., Crepinsek, M. K., & Daft, L. M. (2004). Evaluation of the School Breakfast Program Pilot Project: final report. Nutrition Assistance Program Report Series, CN-04-SBP. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation. (The findings on school nurse visits were only observed for the 2001-2002 school year in this report.)
- 25 Kleinman, R. E., Hall, S., Green, H., Korzec-Ramirez, D., Patton, k., Pagano, M. E., & Murphy, J.M. (2002). Diet, breakfast, and academic performance in children. *Annals of Nutrition and Metabolism*, 46 (Supplement 1), 24-30
- 26 Murphy, J. M., Pagano, M. E., Nachmani, J., Sperling, P., Kane, S., & Kleinman, R. E. (1998). The relationship of school breakfast to psychosocial and academic functioning: cross-sectional and longitudinal observations in an inner-city school sample. *Archives of Pediatrics and Adolescent Medicine*, 152(9), 899-907.
- 27 Crepinsek, M. K., Singh, A., Bernstein, L. S., & McLaughlin, J. E. (2006). Dietary effects of universal-free school breakfast: findings from the evaluation of the school breakfast program pilot project. *Journal of the American Dietetic Association*, 106(11), 1796-1803.
- 28 Murphy et al., 1998. (see endnote #26)