

FRAC Breakfast for Health

We also find that subsidized meals at school or day care are beneficial for children's weight status, and we argue that expanding access to subsidized meals may be the most effective tool to use in combating obesity in poor children.

- Kimbro & Rigby, 2014²⁴

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SCHOOL BREAKFAST PARTICIPATION IMPROVES CHILDREN'S DIETARY INTAKE

- 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} 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.^{6,7,8}
- Children who participate in school breakfast are more likely to consume fruit and milk at breakfast.⁹
- Low-income children who eat school breakfast have better overall diet quality than those who eat breakfast elsewhere or skip breakfast.¹⁰ Similarly, low-income students who eat both school breakfast and lunch have significantly better overall diet quality than low-income students who do not eat school meals.¹¹ An improvement in dietary quality also may extend to the family members of children with access to the breakfast program.¹²

SCHOOL BREAKFAST DECREASES THE RISK OF FOOD INSECURITY

- School breakfast offered to all students for free* may eliminate disparities between food secure and food insecure children in terms of eating breakfast at all.¹³
- Students with improved nutrient intake as a result of a program of school breakfast offered free to all students report decreases in symptoms of hunger.¹⁴
- Access to school breakfast decreases the risk of marginal food insecurity and breakfast skipping, especially for low-income children.^{15,16,17}
- Children are more vulnerable to food insecurity during the summer – a time when many do not have access to the good nutrition provided by the regular year school meal programs.^{18,19}

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.^{20,21,22}
- Food insecure girls participating in the school lunch, school breakfast, or Supplemental Nutrition Assistance (SNAP, or food stamps) programs (or all three programs combined) have a lower risk of overweight compared to food insecure girls from non-participating households.²³
- Participation in federally-funded meals in child care, preschool, school, or summer settings is associated with a lower BMI among young, low-income children.²⁴

*Offering breakfast to all students for free is sometimes referred to as “universal breakfast” or “universal-free breakfast.” The program helps remove the stigma for low-income children of participation in school breakfast and thereby increases participation among students generally, but particularly low-income students.

- 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, decreased risk for obesity) in the short term and long term than those who skip breakfast.^{25,26,27,28,29,30,31,32,33}
- Increasing participation in the federal nutrition programs – including school breakfast – is a childhood obesity prevention strategy recommended by two Institute of Medicine (IOM) committees and the White House Task Force on Childhood Obesity.^{34,35,36}

SCHOOL BREAKFAST PARTICIPATION PROTECTS AGAINST OTHER NEGATIVE HEALTH OUTCOMES

- 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.^{37,38,39,40,41,42}
- School breakfast, including breakfast offered free to all students, has been linked with fewer visits to the school nurse, particularly in the morning.⁴³
- School breakfast participation, especially breakfast offered free to all students, positively impacts children’s mental health, including reductions in behavioral problems, anxiety, and depression.^{44,45}
- Food insecurity is associated with some of the most costly health problems in the U.S., including diabetes, heart disease, and depression.^{46,47,48,49,50} Children experiencing hunger are more likely to experience lower physical functioning, more frequent stomachaches and headaches, and mental health problems (e.g., depression and anxiety), and to be in poorer health.^{51,52,53,54,55,56,57}

SCHOOL BREAKFAST HELPS IMPROVE CHILDREN’S ACADEMIC PERFORMANCE; SKIPPING BREAKFAST IMPAIRS DEVELOPMENT AND LEARNING[†]

- Students who participate in school breakfast show improved attendance, behavior, and academic performance as well as decreased tardiness.^{58,59}
- Participating in school breakfast is associated with improved math grades, attendance, and punctuality.⁶⁰
- Children who are undernourished have poorer cognitive functioning when they miss breakfast.⁶¹
- Behavioral, emotional, and academic problems are more prevalent among children with hunger.⁶²
- Children experiencing hunger have lower math scores and are more likely to repeat a grade.⁶³

BREAKFAST IN THE CLASSROOM PROGRAMS[‡] OFFERING BREAKFAST FREE TO ALL CHILDREN IN THE CAFETERIA YIELD OTHER POSITIVE RESULTS

- Programs offering breakfast free to all students and breakfast in the classroom boost student breakfast participation.^{64,65,66,67}
- Student math and reading achievement test scores improve when breakfast is moved out of the cafeteria and into the classroom.⁶⁸
- 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.⁶⁹
- 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.⁷⁰

[†]For more information, read FRAC’s *Breakfast for Learning* brief available at www.frac.org.

[‡]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.

ENDNOTES

- 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. & Suito, 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 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.
- ⁶ 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.
- ⁷ Affenito, S. G., Thompson, D., Dorazio, A., Albertson, A. M., Loew, A., & Holschuh, N. M. (2013). Ready-to-eat cereal consumption and the School Breakfast Program: relationship to nutrient intake and weight. *Journal of School Health*, 83(1), 28-35.
- ⁸ 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.
- 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 Basiotis, P. P., Lino, M., & Anand, R. S. (1999). Eating breakfast greatly improves schoolchildren's diet quality. *Nutrition Insight*, 15. Alexandria, VA: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion.
- ¹¹ Hanson, K. L. & Olson, C. M. (2013). School meals participation and weekday dietary quality were associated after controlling for weekend eating among U.S. school children aged 6 to 17 years. *Journal of Nutrition*, 143, 714-721.
- ¹² Bhattacharya et al., 2006.
- ¹³ Khan, S., Pinckney, R. G., Keeney, D., Frankowski, B., & Carney, J. K. (2011). Prevalence of food insecurity and utilization of food assistance program: an exploratory survey of a Vermont middle school. *Journal of School Health*, 81(1), 15-20.
- ¹⁴ 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.
- ¹⁵ Bartfeld, J., Kim, M., Ryu, J. H., & Ahn, H. (2009). The School Breakfast Program participation and impacts. *Contractor and Cooperator Report*, 54. Washington, DC: U.S. Department of Agriculture.
- ¹⁶ Bartfeld, J. S. & Ahn, H. M. (2011). The School Breakfast Program strengthens household food security among low-income households with elementary school children. *Journal of Nutrition*, 141(3), 470-475.
- ¹⁷ Bartfeld, J. S. & Ryu, J. H. (2011). The School Breakfast Program and breakfast-skipping among Wisconsin elementary school children. *Social Service Review*, 85(4), 619-634.
- ¹⁸ Nord, M. & Romig, K. (2006). Hunger in the summer: seasonal food insecurity and the National School Lunch and Summer Food Service programs. *Journal of Children and Poverty*, 12(2), 141-158.
- ¹⁹ Nalty, C., Sharkey, J., & Dean, W. (2013). School-based nutrition programs are associated with reduced child food insecurity over time among Mexican-origin mother-child dyads in Texas Border Colonias. *Journal of Nutrition*, 143, 708-713.
- ²⁰ 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.
- ²¹ Millimet, D. L., Tchernis, R., & Husain, M. (2010). School nutrition programs and the incidence of childhood obesity. *Journal of Human Resources*, 45(3), 640-654.
- ²² Millimet, D. L. & Tchernis, R. (2013). Estimation of treatment effects without an exclusion restriction: with an application to the analysis of the School Breakfast Program. *Journal of Applied Economics*, 28, 982-1017.
- ²³ Jones, S. J., Jahns, L., Laraia, B. A., & Haughton, B. (2003). Lower risk of overweight in school-aged food insecure girls who participate in food assistance: results from the Panel Study of Income Dynamics Child Development Supplement. *Archives of Pediatric and Adolescent Medicine*, 157(8), 780-784.
- ²⁴ 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.
- ²⁵ 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.
- ²⁶ Affenito et al., 2013.
- ²⁷ 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.
- ²⁸ Deshmukh-Taskar et al., 2010.
- ²⁹ 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.
- ³⁰ 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.
- ³¹ 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.
- ³² 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.
- ³³ Wojcicki, J. M., Schwartz, N., Jiménez-Cruz, A., Bacardi-Gascon, M., & Heyman, M. B. (2012). Acculturation, dietary practices and risk for childhood obesity in an ethnically heterogeneous population of Latino school children in the San Francisco bay area. *Journal of Immigrant and Minority Health*, 14(4), 533-539.

- ³⁴ Institute of Medicine. (2009). *Local Government Actions to Prevent Childhood Obesity*. Washington, DC: The National Academies Press.
- ³⁵ Institute of Medicine. (2011). *Early Childhood Obesity Prevention Policies*. Washington, DC: The National Academies Press.
- ³⁶ White House Task Force on Childhood Obesity. (2010). *Solving the Problem of Childhood Obesity within a Generation*. Available at: http://www.letsmove.gov/sites/letsmove.gov/files/TaskForce_on_Childhood_Obesity_May2010_FullReport.pdf. Accessed on April 28, 2014.
- ³⁷ 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.
- ³⁸ Kapantais, E., Chala, E., Kaklamanou, D., Lanaras, L., Kaklamanou, M., & Tzotzas, T. (2011). Breakfast skipping and its relation to BMI and health-compromising behaviours among Greek adolescents. *Public Health Nutrition*, 14(1), 101-108.
- ³⁹ 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.
- ⁴⁰ Schembre, S. M., Wen, C. K., Davis, J. N., Shen, E., Nguyen-Rodriguez, S. T., Belcher, B. R., Hsu, Y. W., Weigensberg, M. J., Goran, M. I., & Spruijt-Metz, D. (2013). Eating breakfast more frequently is cross-sectionally associated with greater physical activity and lower levels of adiposity in overweight Latina and African American girls. *American Journal of Clinical Nutrition*, 98(2), 275-281.
- ⁴¹ Smith, K. J., Gall, S. L., McNaughton, S. A., Blizzard, L., Dwyer, T., & Venn, A. J. (2010). Skipping breakfast: longitudinal associations with cardio-metabolic risk factors in the Childhood Determinants of Adult Health Study. *American Journal of Clinical Nutrition*, 92(6), 1316-1325.
- ⁴² 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.
- ⁴³ 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.)
- ⁴⁴ Kleinman et al., 2002.
- ⁴⁵ 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.
- ⁴⁶ Heflin, C. M., Siefert, K., & Williams, D. R. (2005). Food insufficiency and women's mental health: Findings from a 3-year panel of welfare recipients. *Social Science and Medicine*, 61, 1971-1982.
- ⁴⁷ Fitzgerald, N., Hromi-Fiedler, A., Segura-Pérez, S., & Pérez-Escamilla, R. (2011). Food insecurity is related to increased risk of type 2 diabetes among Latinas. *Ethnicity and Disease*, 21(3), 328-334.
- ⁴⁸ Seligman, H. K., Bindman, A. B., Vittinghoff, E., Kanaya, A. M., & Kushel, M. B. (2007). Food insecurity is associated with diabetes mellitus: Results from the National Health Examination and Nutrition Examination Survey (NHANES) 1999-2002. *Journal of General Internal Medicine*, 22(7), 1018-1023.
- ⁴⁹ Seligman, H. K., Laraia, B. A., & Kushel, M. B. (2010). Food insecurity is associated with chronic disease among low-income NHANES participants. *Journal of Nutrition*, 140(2), 304-310.
- ⁵⁰ Siefert, K., Heflin, C. M., Corcoran, M. E., & Williams, D. R. (2004). Food insufficiency and physical and mental health in a longitudinal survey of welfare recipients. *Journal of Health and Social Behavior*, 45(2), 171-186.
- ⁵¹ Alaimo, K., Olson, C. M., Frongillo, E. A., Jr., & Briefel, R. R. (2001). Food insufficiency, family income, and health in U.S. preschool and school-aged children. *American Journal of Public Health*, 91(5), 781-786.
- ⁵² Alaimo, K., Olson, C. M., & Frongillo, E. A. (2002). Family food insufficiency, but not low family income, is positively associated with dysthymia and suicide symptoms in adolescents. *Journal of Nutrition*, 132, 719-725.
- ⁵³ McLaughlin, K. A., Green, J. G., Alegría, M., Jane Costello, E., Gruber, M. J., Sampson, N. A., & Kessler, R. C. (2012). Food insecurity and mental disorders in a national sample of U.S. adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51(12), 1293-1303.
- ⁵⁴ Ryu, J. H. & Bartfeld, J. S. (2012). Household food insecurity during childhood and subsequent health status: the early childhood longitudinal study - kindergarten cohort. *American Journal of Public Health*, 102(11), e50-e55.
- ⁵⁵ Casey, P. H., Szeto, K. L., Robbins, J. M., Stuff, J. E., Connell, C., Gossett, J. M., & Simpson, P. M. (2005). Child health-related quality of life and household food security. *Archives of Pediatrics and Adolescent Medicine*, 159(1), 51-56.
- ⁵⁶ Goldman, N., Ettinger de Cuba, S., Sheward, R., Cutts, D., & Coleman, S. (2014). *Food Security Protects Minnesota Children's Health*. Boston, MA: Children's Health Watch.
- ⁵⁷ Weinreb, L., Wehler, C., Perloff, J., Scott, R., Hosmer, D., Sagor, L., & Gundersen, C. (2002). Hunger: its impact on children's health and mental health. *Pediatrics*, 110, e41.
- ⁵⁸ Murphy, J. M. (2007). Breakfast and learning: an updated review. *Journal of Current Nutrition and Food Science*, 1, 3-36.
- ⁵⁹ Basch, C. E. (2011). Breakfast and the achievement gap among urban minority youth. *Journal of School Health*, 81(10), 635-640.
- ⁶⁰ Murphy et al., 1998.
- ⁶¹ Taras, H. (2005). Nutrition and student performance at school. *Journal of School Health*, 75(6), 199-213.
- ⁶² Kleinman, R. E., Murphy, J. M., Little, M., Pagano, M., Wehler, C. A., Regal, K., & Jellinek, M. S. (1998). Hunger in children in the United States: potential behavioral and emotional correlates. *Pediatrics*, 101(1), E3.
- ⁶³ Alaimo, K., Olson, C. M., Frongillo, E. A., Jr. (2001). Food insufficiency and American school-aged children's cognitive, academic and psychosocial development. *Pediatrics*, 108(1), 44-53.
- ⁶⁴ Bernstein et al., 2004.
- ⁶⁵ Bartfeld et al., 2009.
- ⁶⁶ Murphy et al., 1998.
- ⁶⁷ Nanney, M. S., Olaleye, T. M., Wang, Q., Motyka, E., & Klund-Schubert, J. (2011). A pilot study to expand the school breakfast program in one middle school. *Translational Behavioral Medicine*, 1(3), 436-442.
- ⁶⁸ Imberman, S. A. & Kugler, A. D. (2014). The effect of providing breakfast in class on student performance. *Journal of Policy Analysis and Management*, Epub ahead of print (March 19, 2014).
- ⁶⁹ 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.
- ⁷⁰ Murphy et al., 1998.