

FUEL UP FOR BRAIN POWER



Breakfast is shown to make a difference in how kids learn and behave in school. Many studies have been completed that support the link. Despite all of the benefits, it is still common for kids to skip breakfast.

Skipping breakfast and experiencing hunger affects children's ability to learn.

- Children who skip breakfast have slower memory recall.¹
- Hungry children have lower math scores and are more likely to repeat a grade.²
- Behavioral, emotional and academic problems are more prevalent among hungry children.³
- Hungry children are more likely to be hyperactive, absent and tardy, in addition to having behavioral and attention problems more often than other children.⁴
- Hungry teens are more likely to have been suspended from school and have difficulty getting along with other children.⁵

Eating breakfast at school helps improve children's school performance.

- Children who eat breakfast at school – closer to class and test-taking time – perform better on standardized tests than those who skip breakfast or eat breakfast at home.⁶
- Children who eat a complete breakfast, versus a partial one, make fewer mistakes and work faster in math and number checking tests.⁷
- Children perform better on tests of vocabulary and matching figures after eating breakfast.^{8,9}
- Participating in school breakfast is associated with improved math grades, attendance and punctuality.^{10,11}
- Consuming breakfast improves children's performance on demanding mental tasks and reaction to frustration.¹²
- Providing breakfast to students at school improves their concentration, alertness, comprehension, memory, and learning.^{13,14,15}

School breakfast improves student behavior and learning environments.

- Students who participate in school breakfast show improved attendance, behavior, standardized achievement test scores as well as decreased tardiness.¹⁶
- Children who increase their school breakfast participation (as a result of a school breakfast program offered free to all students) show greater improvements in math scores, attendance, punctuality, depression, anxiety, and hyperactivity than children whose participation remains unchanged or decreases.¹⁷

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

- Children who participate in programs that offer a breakfast free to all students have lower rates of absence and tardiness.^{18,19}
- 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 school breakfast program.²⁰



School breakfast can improve children's nutrition and protect against obesity.[‡]

- 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, phosphorus).^{21,22,23}
- A higher percentage of children who skip breakfast have reduced intakes of many nutrients such as vitamins A, E, C, B6, B12; folate; iron; calcium; phosphorus; magnesium; potassium; and dietary fiber.²⁴
- 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.^{25,26}

* 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.

† 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.

‡ For more information, read FRAC's Breakfast for Health brief available at www.frac.org.

¹ Pollitt E, Cueto S, Jacoby ER. "Fasting and Cognition in Well- and Undernourished Schoolchildren: A Review of Three Experimental Studies." *American Journal of Clinical Nutrition* 1998; 67(4):779S-784S.

² Alaimo K, Olson CM, Frongillo EA Jr. "Food Insufficiency and American School-Aged Children's Cognitive, Academic and Psychosocial Development." *Pediatrics* 2001; 108(1):44-53.

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⁴ Murphy JM, Wehler CA, Pagano ME, Little M, Kleinman RE, Jellinek MS. "Relationship Between Hunger and Psychosocial Functioning in Low- Income American Children." *Journal of the American Academy of Child & Adolescent Psychiatry* 1998;37:163-170.

⁵ Alaimo K, "Food Insufficiency." 46. (see footnote #2)

⁶ Vaisman N, Voet H, Akivis A, Vakil E. "Effects of Breakfast Timing on the Cognitive Functions of Elementary School Students." *Archives of Pediatric and Adolescent Medicine* 1996 150:1089-1092.

⁷ Wyon D, Abrahamsson L, Jartelius M, Fletcher R. "An Experimental Study of the Effects of Energy Intake at Breakfast on the Test Performance of 10 Year-Old Children in School." *International Journal of Food Science and Nutrition* 1997;48(1):5-12.

⁸ Pollitt, E. "Fasting and Cognition." 1998. (see footnote #1)

⁹ Jacoby E, Cueto S, Pollitt E. "Benefits of a school breakfast program among Andean children in Huaraz, Peru." *Food and Nutrition Bulletin* 1996; 17:54-64.

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¹¹ Powell CA, Walker SP, Chang SM, Grantham-McGregor SM. "Nutrition and education: a randomized trial of the effects of breakfast in rural primary school children." *American Journal of Clinical Nutrition* 1998;68:873-9.

¹² Bellisle F. "Effects of diet on behaviour and cognition in children." *British Journal of Nutrition* 2004;92 (Suppl 2), S227-S232.

¹³ Grantham-McGregor S, Chang S, Walker S. "Evaluation of School Feeding Programs: Some Jamaican Examples." *American Journal of Clinical Nutrition* 1998; 67(4) 785S-789S.

¹⁴ Brown JL, Beardslee WH, Prothrow-Stith D. "Impact of School Breakfast on Children's Health and Learning." Sodexo Foundation. November 2008

¹⁵ Morris CT, Courtney A, Bryant CA, McDermott RJ. "Grab 'N' Go Breakfast at School: Observation from a Pilot Program." *Journal of Nutrition Education and Behavior* 2010 42(3): 208-209.

¹⁶ Murphy JM. "Breakfast and Learning: An Updated Review." *Journal of Current Nutrition and Food Science* 2007; 3(1): 3-36.

¹⁷ Murphy, J. M., Pagano, M., Nachmani, J., Sperling, P., Kane, S., & Kleinman, R. (1998). (see endnote #10)

¹⁸ Cook JT, Ohri-Vachaspati P, Kelly GL. "Evaluation of a Universally-Free School Breakfast Program Demonstration Project, Central Falls, Rhode Island." Center on Hunger, Poverty and Nutrition Policy, Tufts University, Medford, MA, 1996.

¹⁹ Murphy JM, Pagano M, Nachmani "The Relationship of School Breakfast to Psychosocial and Academic Functioning." (see endnote #10)

²⁰ Crepinsek MK, Singh A, Bernstein LS, McLaughlin JE. "Dietary Effects of Universal-Free School Breakfast: Finding from the Evaluation of the School Breakfast Program Pilot Project." *Journal American Dietetic Association* 2006; 106(11):1796-1803.

²¹ 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.

²² 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.

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²⁴ 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.

²⁵ 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.

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