

The Power of Protein at Breakfast for School-Aged Children*

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In the United States, the prevalence of obesity has more than doubled in adults and more than tripled in children and adolescents since the 1970s. Roughly one in every three children ages 2-19 is overweight or obese. Obese individuals have an increased risk of developing type 2 diabetes mellitus (T2DM), hypertension and dyslipidemia (high cholesterol or triglycerides in the blood). Once restricted to adults, these metabolic diseases are now being diagnosed in children. Some research suggests that eating breakfast may play a role in preventing obesity in children.

Breakfast is a great way to give the body the refueling it needs. Kids who eat breakfast tend to eat healthier overall and are more likely to participate in physical activities – two great ways to help maintain a healthy weight. Breakfast also can help keep kids' weight in check. Breakfast kick-starts the body's metabolism, the process by which the body converts the fuel in food to energy. And when the

metabolism gets moving, the body starts burning calories.

Breakfast Brain Power

It's important for kids to have breakfast every day, but what they eat in the morning is crucial too. Choosing breakfast foods that are rich in whole grains, fiber and protein while low in added sugar may boost kids' attention span, concentration and memory – which they need to learn in school.

Kids who eat breakfast are more likely to get fiber, calcium and other important nutrients. They also tend to keep their weight under control, have lower blood cholesterol levels and fewer absences from school and make fewer trips to the school nurse with stomach complaints related to hunger.

Increasing protein in the diet has been linked to improved glucose and insulin control, cholesterol, body composition and energy metabolism as well as increased weight loss in adults. However, very little research has focused on determining if increasing protein in the diet of school-aged children has the same health benefits.

Protein Needs for Children

In general, it is recommended that 10 to 35 percent of daily calories come from protein. In the United States, meeting protein needs is not an issue for most children. However,



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protein intake is still well below the upper end of the acceptable range, which is 35 percent of daily calories [1]. See the table below for the Recommended Dietary Allowances (RDA) for protein in children from different age groups.

Recommended Dietary Allowance for Protein

	Grams of Protein Needed Each Day
Children ages 1-3	13
Children ages 4-8	19
Children ages 9-13	34
Girls ages 14-18	46
Boys ages 14-18	52

The Negative Consequences of Skipping Breakfast

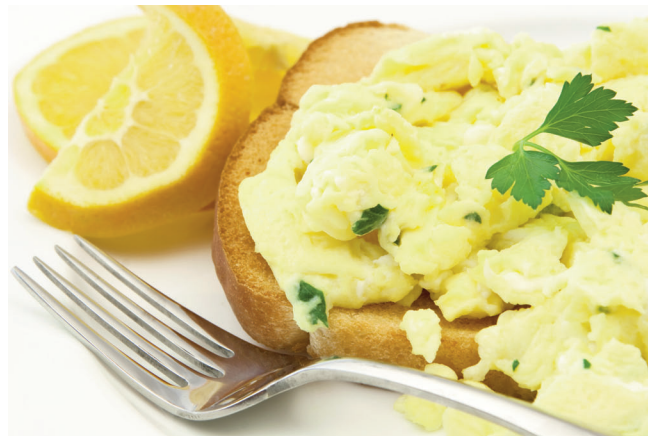
Breakfast is a key component of a healthy diet and can positively impact children's health and well-being. However, there has been a steady decline in breakfast consumption in American children over the past 40 years. Breakfast consumption declined among 8- to 10-year-old children by 9 percent and adolescents by 20 percent [2]. A recent survey conducted in 11- to 15-year-olds indicated that only 54 percent of boys and 42 percent of girls eat breakfast daily [3].

Skipping breakfast can make kids feel tired, restless or irritable. In the morning, their bodies need to refuel for the day ahead after going without food for 8 to 12 hours during sleep. Their mood and energy can drop by midmorning if they don't eat at least a small morning meal.

Cross-sectional studies have shown a relationship between skipping breakfast and body fat in children. Skipping breakfast may lead to greater hunger later in the day, which could lead to over-eating [4]. Children who skip breakfast also have reduced intake of essential nutrients. For example, breakfast skipping is associated with reduced fruit and vegetable intake, reduced fiber intake as well as lower intakes of several micronutrients such as vitamins A, B, E, C, B6 and B12; folate; iron; calcium; potassium; and magnesium compared to children who eat breakfast [5]. Skipping breakfast has also been shown to impact performance at school by negatively affecting problem solving, short-term memory and attention [6].

The Benefits of Eating Protein at Breakfast

In many cultures, the foundation for breakfast is carbohydrates (e.g., cereals). Proteins are typically eaten at lunch or dinner. Incorporating protein into breakfast could result in increased satiety and reduced energy intake throughout the day. One study has shown that children consuming a high protein diet (23 to 28 percent energy from protein) for 6 months had reduced waist circumference, blood pressure and serum insulin compared to children consuming a low protein diet (10 to 15 percent energy from protein) [7]. Another study showed that females (9-14 years) and males (10-15 years) who consumed animal protein had more muscle mass and less fat mass than those who did not eat protein. [8]. In the same study, plant protein was not associated with body composition. These studies demonstrate that there is a clear benefit of protein consumption on body composition, but it is not clear if increased protein intake at breakfast (versus other times of day) has the same effect.



In a recent study at the University of Arkansas, children (ages 8-12 years) were fed both a protein-based breakfast (22 percent of calories from protein) and a carbohydrate-based breakfast (4 percent protein) with a one-week wash-out period in-between [9]. Data from this study showed that providing school-aged children increased protein at breakfast decreases hunger and increases fullness four hours after breakfast compared to a carbohydrate-based breakfast low in protein. In addition, children consuming the higher-protein breakfast burned significantly more energy over the four-hour testing period compared to when they consumed the low protein breakfast. While these data suggest the potential for increased protein at breakfast to have anti-obesity benefits in school-aged children, more research over the longer term is needed.

Easy Ways to Add More Protein to Breakfast

It is easy to incorporate more protein into children's breakfasts. Here are a couple of ideas for including more high-quality protein in breakfast:

- Eggs: Make a breakfast burrito or a breakfast sandwich with scrambled eggs for a portable breakfast. Eggs can also be served with toast or prepared in an omelet with low-fat cheese and vegetables.
- Dairy: Adding Greek yogurt to fruit smoothies is a way to add 10-15 grams of protein to a child's breakfast. Eating low-fat regular or Greek yogurt by itself or mixed with cereal and fruit is another way to add protein to breakfast.
- Breakfast meats: Add lean breakfast meats such as turkey bacon, turkey sausage or Canadian bacon to breakfast.

Note: Don't forget about total energy intake – aim for around 300-350 calories. When adding protein to breakfast, reduce simple carbohydrate foods with low nutrient density such as waffles, syrup, juices and white bread. Consider increasing the amount of whole grains instead. Adding foods such as whole grain breads or whole-wheat tortillas may increase satiety.

References

1. Fulgoni, V.L., 3rd, Current protein intake in America: analysis of the National Health and Nutrition Examination Survey, 2003-2004. *Am J Clin Nutr*, 2008. 87(5): p. 1554S-1557S.
2. Siega-Riz, A.M., B.M. Popkin, and T. Carson, Trends in breakfast consumption for children in the United States from 1965-1991. *Am J Clin Nutr*, 1998. 67(4): p. 748S-756S.
3. Haug, E., et al., Overweight in school-aged children and its relationship with demographic and lifestyle factors: results from the WHO-Collaborative Health Behaviour in School-Aged Children (HBSC) study. *Int J Public Health*, 2009. 54 Suppl 2: p. 167-79.
4. Nicklas, T.A., et al., Breakfast consumption affects adequacy of total daily intake in children. *J Am Diet Assoc*, 1993. 93(8): p. 886-91.
5. Nicklas, T.A., et al., Breakfast consumption with and without vitamin-mineral supplement use favorably impacts daily nutrient intake of ninth-grade students. *J Adolesc Health*, 2000. 27(5): p. 314-21.
6. Mahoney, C.R., et al., Effect of breakfast composition on cognitive processes in elementary school children. *Physiol Behav*, 2005. 85(5): p. 635-45.
7. Damsgaard, C.T., et al., Higher protein diets consumed ad libitum improve cardiovascular risk markers in children of overweight parents from eight European countries. *J Nutr*, 2013. 143(6): p. 810-7.
8. Assmann, K.E., et al., Prospective association of protein intake during puberty with body composition in young adulthood. *Obesity* (Silver Spring), 2013. 21(12): p. E782-9.
9. Binns, A., M. Gray, H. Seo, B. Zhang, C. Luckett, K. Smith, and J.I. Baum. Consumption of an egg-based breakfast reduces hunger and increases postprandial energy metabolism in normal weight (NW) and overweight (OW) school-aged children. *FASEB Journal*, 2014. 28: p. 381.4.

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