



U.S. Department  
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# Breakfast Consumption, Body Weight, and Nutrient Intake: A Review of the Evidence

## Nutrition Insight 45

### BACKGROUND

Maintaining a healthy body weight and meeting nutrient requirements are vital to maintaining good health. However, many Americans are overweight or obese, indicating that they consume more calories from foods and beverages than they expend through normal bodily function and physical activity. In addition, many Americans consume too few vegetables, fruits, whole grains, milk and milk products, and oils, which results in inadequate intake of a number of nutrients, including potassium, dietary fiber, calcium, and vitamin D.

A growing body of research has investigated the impact of eating behaviors, such as consuming breakfast, on body weight, as well as nutrient intakes. This *Nutrition Insight* provides an overview of the systematic evidence-based reviews on the relationship between breakfast intake and (1) body weight and (2) nutrient intakes conducted by the 2010 Dietary Guidelines Advisory Committee (DGAC) and the USDA Nutrition Evidence Library (NEL) to support the development of the *Dietary Guidelines for Americans, 2010*.

### REVIEW OF THE EVIDENCE

The 2010 DGAC conducted several systematic reviews examining the relationships between breakfast consumption, body weight, and achieving recommended nutrient intakes using a rigorous, transparent, and reproducible methodology (Spahn, Lyon, Altman, et al., 2011). The 2010 DGAC report can be accessed at [www.dietaryguidelines.gov](http://www.dietaryguidelines.gov), and information on search terms, databases queried, evidence abstraction and analysis, and criteria for study quality can be accessed at [www.nutritionevidencelibrary.gov](http://www.nutritionevidencelibrary.gov).

#### Breakfast and Body Weight

Two NEL systematic reviews were conducted to assess the relationship between breakfast intake and body weight; one in children and one in adults. Both reviews included studies published between 2000 and 2009. The majority of studies included in these reviews defined breakfast as an eating occasion that occurred between 5 a.m. and 10 a.m. on weekdays and 5 a.m. and 11 a.m. on weekends.

#### USDA NUTRITION EVIDENCE LIBRARY

The USDA Nutrition Evidence Library (NEL) specializes in conducting systematic reviews to inform Federal nutrition policy and programs. The Library is a key resource for making food and nutrition research accessible to all Americans.

[www.NEL.gov](http://www.NEL.gov)

#### Children

The review in children identified 15 studies: 1 randomized controlled trial (RCT), 1 non-RCT, and 13 prospective cohort studies. Thirteen studies were given a positive quality rating, and two were rated neutral.

Eleven studies found that breakfast intake was associated with lower body weight in children.

- Five studies found the association in all subjects.
- One study found the relationship only among obese children, and one study found the relationship only among normal weight children.
- Two studies found that breakfast intake was associated with lower body weight in boys, but not in girls; and one study found that breakfast intake was associated with lower weight in girls, but not in boys.
- One study found that cereal intake was associated with lower weight, but not overall breakfast intake.

Three studies found no relationship between breakfast consumption and body weight in children.

- One study found that breakfast combined with nutrition education was related to lower weight, but not breakfast alone.
- Two studies initially found a relationship between breakfast and lower body weight, but after adjusting for potential confounders, the relationship was no longer significant.

Two studies found that breakfast intake was associated with higher body weight.

- One found this association only among overweight children, while normal-weight breakfast consumers had lower weight.

- The second study found that breakfast was associated with increased body weight in college students.

### Adults

The review in adults identified six prospective cohort studies. All received a positive quality rating. Four studies found that breakfast intake was associated with lower body weight or less weight gain over time. One study initially found a relationship with lower body weight, but after adjusting for potential confounders the relationship was no longer significant. Finally, one study found that breakfast intake was associated with lower body weight in men, but not in women. The DGAC did not review the literature on the use of breakfast consumption as a tool for adults actively losing weight.

### Breakfast and Nutrient Intake

The NEL systematic review conducted to investigate the relationship between breakfast consumption and nutrient intake included 15 studies published between 2004 and 2009. Four studies were conducted in adults (4 cross-sectional studies), and 11 studies were conducted in children (1 systematic review, 3 cohort studies, and 7 cross-sectional studies). Fourteen studies received a positive quality rating, and one was rated neutral. Breakfast consumption and breakfast skipping were defined uniquely in most studies.

A variety of nutrients were included in the studies reviewed, and the nutrients examined varied widely between studies. Individuals who consumed breakfast on a daily basis consistently had higher intakes of dietary fiber, thiamin, niacin, riboflavin, vitamins B<sub>6</sub> and B<sub>12</sub>, dietary folate, vitamins A and C, calcium, iron, magnesium, phosphorus, potassium and zinc (not all nutrients were evaluated in all studies). However, there was not a consistent association between breakfast consumption and total fat, saturated fat, cholesterol, and sodium intakes.

## CONCLUSIONS AND FUTURE RESEARCH

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The 2010 DGAC concluded that moderate evidence suggests that children who do not eat breakfast are at increased risk of overweight and obesity, and that the evidence is stronger for adolescents. However, there is inconsistent evidence that adults who skip breakfast are at increased risk for overweight and obesity.

The 2010 DGAC also concluded that moderate evidence supports a positive relationship between the behavior of breakfast consumption and intake of certain nutrients in children, adolescents, and adults.

In addition, the 2010 DGAC identified several areas for future research. They recommended that a panel of experts be convened to develop definitions for breakfast intake and/or breakfast skipping. They also recommended that more methodologically strong research is needed to better understand the relationship between dietary intake behaviors and body weight, such as research that investigates the relationship between consuming specific foods and beverages at breakfast and weight.

## FROM RESEARCH TO RECOMMENDATIONS

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The conclusions from the 2010 DGAC report, including those on the relationship between breakfast intake and health-related outcomes, formed the basis for the recommendations made in *The Dietary Guidelines for Americans (DGA), 2010* (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2010). The DGA includes two overarching concepts:

- 1. Maintain calorie balance over time to achieve and sustain a healthy weight.**
- 2. Focus on consuming nutrient-dense foods and beverages.**

The 2010 DGA encourage individuals to select a healthy eating pattern that meets nutrient needs at an appropriate calorie level over time in order to achieve these goals. In addition, the 2010 DGA highlight several behaviors that have been shown to help people manage body weight, as well as to assist in consuming more nutrient-dense foods and beverages. Breakfast consumption is one such behavior that promotes weight management and helps promote adequate nutrient intake. The 2010 DGA include the following guidance related to breakfast:

**Eat a nutrient-dense breakfast.** The report indicated that not eating breakfast has been associated with excess body weight, especially among children and adolescents. Consuming breakfast also has been associated with weight loss and weight loss maintenance, as well as improved nutrient intake.

## REFERENCES

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Spahn J.M., Lyon J.M.G., Altman J.M., et al. The systematic review methodology used to support the 2010 Dietary Guidelines Advisory Committee. *J Am Diet Assoc.* 2011; 111(4):520-523.

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