



Barley and Weight Management

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- Obesity is a global epidemic that increases the risk of chronic disease.
- Whole-grain, high-fibre foods such as barley promote satiety and are associated with lower body weight.
- Low-glycemic-index diets are beneficial for weight loss. Barley has the lowest glycemic index of the cereal grains.
- Barley β -glucan may act as a prebiotic to support the growth of beneficial bacteria that may prevent weight gain.

Obesity: Facts and Figures

Obesity is a global epidemic associated with diabetes, hypertension, cardiovascular disease and some cancers¹. Between 2007 and 2009, the prevalence of obesity in Canada and the United States was 24.1 per cent and 34.4 per cent, respectively¹. The worldwide prevalence of overweight and obesity has almost doubled over the past three decades². An estimated 2.8 million people worldwide die annually due to being overweight or obese². In Canada, the estimated economic cost of obesity was \$4.6 billion in 2008, an increase of 19 per cent from \$3.9 billion in 2000³.





Whole-Grain, High-Fibre Foods Help with Weight Management

A variety of food factors contribute to satiety—and thus weight management—including fibre⁴. Since fibre is not enzymatically digested and absorbed, but instead undergoes various degrees of fermentation in the large intestine, it effectively lowers dietary energy density⁵. Barley has the highest fibre content of the whole grains⁶. Soluble fibres, such as the β -glucan in barley, contribute to satiety by absorbing large amounts of water and forming gels, thereby increasing stomach distension and slowing gastric emptying⁵. An overview of the mechanisms by which dietary fibre may affect body weight is shown in Figure 1.

Epidemiological studies demonstrate that a daily intake of approximately three servings of whole grains is associated with a lower body mass index (BMI) and a reduction in central adiposity⁶. Thus, whole-grain intake may also protect against metabolic syndrome, which is defined as a cluster of metabolic abnormalities for which central obesity is a primary criterion for diagnosis⁷.

Ad libitum consumption of high-fibre diets by healthy adults results in increased satiety, reduced hunger, lower energy intake, and weight loss. Results of a systematic review found an average weight loss of 1.9 kilograms over 3.8 months in healthy individuals with consumption of high-fibre diets⁵. Such diets may even have a more pronounced effect among overweight and obese individuals by reducing energy intakes to 82 per cent of control and resulting in an average weight loss of 2.4 kilograms⁵.

The Academy of Nutrition and Dietetics has concluded that dietary fibre from whole foods or supplements may promote weight loss when intakes are 20 to 27 grams per day⁸. A reduced caloric diet is supported as part of a weight management program by the Academy of Nutrition and Dietetics and the Obesity Canada Clinical Practice Guidelines Expert Panel^{9,10}. As a high-fibre, low-fat, whole-grain food, barley has a low energy density that aligns well with recommendations for weight control.

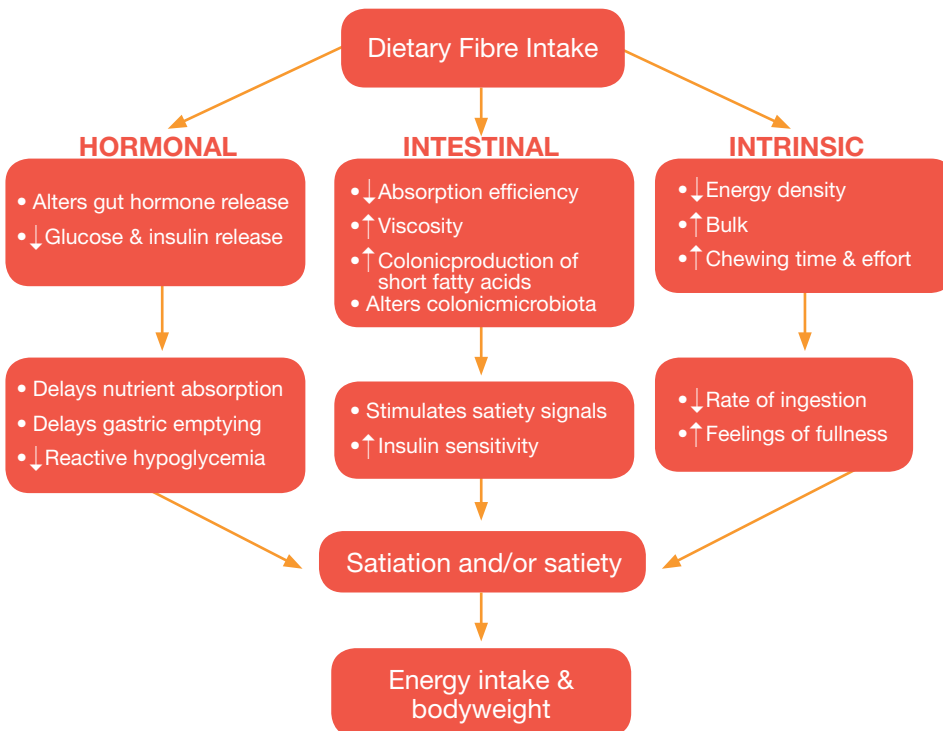


Figure 1. Mechanisms by which dietary fibre intake affects body weight

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Low-Glycemic-Index Foods and Weight Management

Barley has the lowest glycemic index (GI) of the food grains¹². Low-GI foods may promote satiety and control weight by providing a slower postprandial glycemic response, thereby stimulating less insulin release and greater fatty acid oxidation than high-GI foods¹³. These diets have been shown to significantly reduce BMI and total fat mass in overweight or obese individuals¹³. In fact, an ad libitum low-GI diet may produce equivalent or better weight-loss outcomes than a conventional restricted-energy, low-fat diet¹³.

The Gut Microbiome, Prebiotics and Obesity

Emerging evidence suggests that the human intestinal microbiome plays an important role in weight management. Novel studies in animals in which gut microbes have been transplanted between lean and obese animals have demonstrated important interactions between diet and gut microbiota on body weight status¹⁴. Germ-free mice inoculated with obese microbiota from humans have increased adiposity, whereas those inoculated with lean microbiota stay lean¹⁵. A high-fibre, low-fat diet further improves the efficacy of the lean microbiota¹⁶.

Prebiotics are non-digestible food components—including some fermentable fibres—that selectively stimulate the activity of beneficial intestinal bacteria and improve the health of the host⁶. β -glucan has been shown to be highly fermentable and may possess prebiotic properties that promote weight management⁴. Bacteroidetes and Firmicutes are two groups of beneficial bacteria found in the human intestine. The proportion of Bacteroidetes is lower in obese individuals compared with those who are lean, and increases with weight loss¹⁶.

High-fibre diets are also associated with greater fecal energy losses than low-fibre diets with equivalent energy content¹⁷. The degree of fecal energy loss could be affected by the bacterial composition of the human gut microbiota¹⁷. A 20 per cent increase in Firmicutes bacteria with a corresponding decrease in Bacteroidetes resulted in a 150-kilocalories-per-day increase in energy absorption¹⁷. Over time, this small change in energy balance could have a significant effect on weight loss or weight maintenance.

Cholecystokinin, peptide YY, glucagon-like peptide 1 and ghrelin are hormones that play key roles in appetite and satiety⁶. Prebiotic fermentation may play a role in weight management by producing short-chain fatty acids that slow gastrointestinal motility and increase the release of satiety hormones¹⁸.

Although this research is still in its early stages, it shows promise for the role of high-fibre foods that contain prebiotics, such as barley, in supporting the growth of gut microbiota that promote weight loss.



GoBarley.com

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