

### What is whey protein?

Whey protein is a high-quality protein naturally found in dairy. It is a complete protein containing all of the essential amino acids (“building blocks”) your body needs and is easy to digest. Whey protein is also one of the best sources of branched-chain amino acids (BCAA) including leucine, which has been shown to stimulate muscle synthesis.<sup>1</sup>

### How is whey protein made?

Whey is one of two major proteins found in cow’s milk. Whey protein is produced during the process of making cheese, which begins when special enzymes are added to milk causing it to separate. The curds are used to make cheese, leaving behind whey protein in the liquid portion. This liquid whey is then pasteurized and dried into a powder for various uses.

### Are some protein sources better than others?

The quality of protein varies. High-quality, “complete” protein sources include animal-based proteins such as meat, fish, poultry, eggs, milk, cheese, yogurt, and whey protein. These foods supply all of the essential amino acids the body needs to build and maintain muscle and to function properly. Protein found in most plant foods, including legumes, seeds, nuts, vegetables, and grain products, is considered “incomplete” protein because it lacks some of the essential amino acids needed daily.

### What are the health benefits of whey protein?

**Maintain a Healthy Weight:** A reduced calorie, higher protein diet including whey protein may improve the quality of weight loss by helping you lose more fat and/or maintain more lean muscle.<sup>2,3,4</sup>

**Curb Hunger:** Calorie for calorie, whey protein can help people feel fuller longer than carbohydrates or fats.<sup>5,6,7,8</sup>

**Get Lean:** Consuming whey protein and performing resistance exercise regularly can help build more lean muscle than resistance training alone or resistance training combined with carbohydrate consumption.<sup>9,10,11</sup>

**Enhance Recovery:** Consuming whey protein after exercise helps to build and repair muscle.<sup>9,12</sup>

**Reduce Muscle Loss:** Emerging research shows older Americans may be able to reduce the age-related decline of muscle mass by engaging in resistance training and consuming higher than the Recommended Dietary Allowance (RDA) for protein.<sup>13,14</sup>

### How much whey protein does a person need?

Most people need at least 0.4 grams of protein for every pound of body weight to meet basic protein requirements.<sup>5</sup> Although most people meet minimum protein requirements, athletes and older adults may benefit from a higher protein intake.<sup>4,15,16</sup> To find out how much protein you should be getting, visit [www.nationaldairycouncil.org/wheyprotein](http://www.nationaldairycouncil.org/wheyprotein) and click on the downloadable worksheet, *Assessing Your Daily Protein Intake*.

### Can a person get too much protein?

The Institute of Medicine recommends that 10 to 35 percent of the total calories we consume each day should come from protein.<sup>5</sup> Although most people meet minimum protein requirements, athletes and older adults may benefit from a higher protein intake.<sup>4,15,16</sup>

### What is the difference between whey protein concentrate, whey protein isolate, and hydrolyzed whey protein?

Whey protein isolate contains a higher concentration of protein per gram than whey protein concentrate because other ingredients, including lactose, fat, and some vitamins and minerals, are removed. Both offer health benefits and are used in various foods and powders. Hydrolyzed whey protein is created when the protein chains are broken down into smaller chains of amino acids called “peptides.” This form of whey protein is most commonly used in infant formulas, medical protein supplements, and some sports drinks.

### Can people who are lactose intolerant eat whey protein?

If you are lactose intolerant, or sensitive to lactose, the natural sugar found in milk products, you may be able to tolerate whey protein isolate, which contains very little lactose. The amount of lactose in whey protein concentrate is higher. As always, it is important to contact the manufacturer as lactose content can vary from product to product.

### Does whey protein contain gluten or wheat protein?

Whey protein does not contain any wheat protein or gluten. However, whey protein bars and beverages often contain added wheat-based ingredients, so be sure to check the ingredients list.

### Does whey protein have a gritty or unpleasant taste like some other protein powders?

Whey protein has a clean, neutral flavor. When used in food manufacturing, it adds little or no taste. Whey protein dissolves easily in liquids and does not have a gritty mouth feel.

### Where can whey protein be found?

Whey protein can be found in powders, drink mixes, energy bars, yogurt, and other foods. Products with whey protein as a major source of protein will list “whey protein isolate,” “whey protein concentrate,” or “hydrolyzed whey protein” near the beginning of the ingredients list. Whey protein powder is very convenient and can be added to smoothies, oatmeal, soups, sauces, dips, baked goods, or other common foods.

- 1 Norton LE and Layman DK. Leucine regulates translation initiation of protein synthesis in skeletal muscle after exercise. *J Nutr.* 2006; 136: 533S-7S.
- 2 Layman DK, et al. A moderate-protein diet produces sustained weight loss and long-term changes in body composition and blood lipids in obese adults. *J Nutr.* 2009; 139: 1-8.
- 3 Leidy HJ, et al. Higher protein intake preserves lean mass and satiety with weight loss in pre-obese and obese women. *Obesity.* 2007; 15(2): 421-9.
- 4 Westerterp-Plantinga MS, et al. Dietary protein, weight loss, and weight maintenance. *Annu Rev Nutr.* 2009; 29: 11.1-11.21.
- 5 IOM (Institute of Medicine). Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. *Washington, DC: The National Academies Press.* 2005; 589-90.
- 6 Smeets AJ, et al. Energy expenditure, satiety, and plasma ghrelin, glucagon-like peptide 1, and peptide tyrosine-tyrosine concentrations following a single high-protein lunch. *J Nutr.* 2008; 138(4): 698-702.
- 7 Beasley JM, et al. Associations between macronutrient intake and self-reported appetite and fasting levels of appetite hormones: results from the optimal macronutrient intake trial to prevent heart disease. *Am J Epidemiol.* 2009; 169(7): 893-900.
- 8 Halton TL and Hu FB. The effects of high protein diets on thermogenesis, satiety and weight loss: a critical review. *J Am Coll Nutr.* 2004; 23(5): 373-85.
- 9 Tang JE, et al. Minimal whey protein with carbohydrate stimulates muscle protein synthesis following resistance exercise in trained young men. *Appl Physiol Nutr Metab.* 2007; 32: 1132-38.
- 10 Burke DG, et al. The effect of whey protein supplementation with and without creatine monohydrate combined with resistance training on lean tissue mass and muscle strength. *Int J Sport Nutr Exerc Metab.* 2001; 11(3): 349-64.
- 11 Phillips SM, et al. Dietary protein to support anabolism with resistance exercise in young men. *J Am Coll Nutr.* 2005; 24(2): 134S-9S.
- 12 Howarth KR, et al. Coingestion of protein with carbohydrate during recovery from endurance exercise stimulates skeletal muscle protein synthesis in humans. *J Apply Physiol.* 2009; 106: 1394-1402.
- 13 Paddon-Jones D, et al. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr.* 2008; 87(suppl): 1562S-6S.
- 14 Kim J-S, et al. Dietary implications on mechanisms of sarcopenia: roles of protein, amino acids and antioxidants. *J Nutr Biochem.* 2010; 21(1): 1-13.
- 15 Position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance. *J Am Diet Assoc.* 2009; 109: 509-27.
- 16 Gaffney-Stomberg E, et al. Increasing dietary protein requirements in elderly people for optimal muscle and bone health. *J Am Geriatr Soc.* 2009; 57: 1073-79.