

The Power of Protein

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What Is Protein? [1]

Protein is a powerful nutrient. It plays a major role in your body – from building body tissues to making important hormones.

Protein is an important macro-nutrient used by the body for building, repairing and maintaining tissues. Proteins are part of every cell, tissue and organ in our bodies. They are made up of amino acids, the building blocks of protein.

There are 20 different amino acids needed by the body. These amino acids join together to make different types of protein. Nine amino acids are considered essential amino acids, since they are not made by the body and, therefore, must be obtained from food. The other amino acids are made by the body and are considered nonessential amino acids.

The proteins in our bodies are constantly being broken down and replaced. The body does not store amino acids like it does carbohydrates and fats, so the body needs a daily supply of amino acids to make new proteins. The protein in the foods we eat is digested into amino acids that can be used to replace the proteins in our bodies.

The Role of Protein in the Body

As a nutrient, protein performs many functions in the body. An adequate dietary protein intake is important for building, maintaining and repairing body tissues. The body's structural components, such as skin, muscles, bones and organs, are made

up in large part by protein. Many hormones and enzymes that function to regulate body processes and chemical reactions are made of protein. Protein is also used to make antibodies to fight disease. If you do not consume enough carbohydrate and fat, proteins can also supply your body with energy. When you don't have enough protein, you may experience loss of muscle mass that can cause physical weakness, fatigue and a weakened immune system.

Dietary Protein Needs

Dietary protein quality is determined by its amino acid composition and its digestibility in the intestine. Animal sources of protein, such as poultry, lean beef, pork, fish and eggs, provide high-quality protein with all of the essential amino acids and are called complete proteins. Plant sources of protein, such as beans, nuts and seeds, contain inadequate amounts



Food sources of protein, including cheese, lentils, red and white meat, kidney beans, fish, tuna, nuts and eggs.

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of one or more amino acids and are called incomplete proteins. With the exception of soy protein, plant proteins need to be consumed in a combination that ensures all essential amino acids are in the diet [2].

Protein needs for adults depend on an individual's body weight and are often expressed as a percentage of energy intake. The current Dietary Reference Intakes (DRI) for protein state that an acceptable protein range for adults is 10 to 35 percent of total daily energy intake [3]. The current minimum Recommended Dietary Allowance (RDA) for protein for adults is 0.8 gram of protein per kilogram body weight [3]. This is equal to 56 grams of protein per day for a 150-pound person [2].

Current research and expert opinion, however, show that the RDA for protein of 0.8 gram per kilogram of body weight may not be adequate as we age. The current RDA was made based on research in young adults and does not promote optimal health or protect older adults from loss of muscle and function with aging. Experts now estimate that older adults need 1.2 grams or more of protein per kilogram of body weight per day. Additionally, researchers recommend that an adequate amount of protein intake with each meal is important to promote protein anabolism (or protein building). These recommendations state that an intake of 25 to 30 grams of high-quality protein per meal is necessary for optimal muscle protein synthesis. Protein intakes at this level are particularly beneficial for older adults as a strategy to maintain muscle mass [4-6].

Dietary Protein and Health

High-protein diets have received a lot of attention when it comes to health and wellness. Research suggests that increasing the amount of protein and decreasing the amount of carbohydrates consumed can have beneficial effects on metabolic health and body composition. Initially, high-protein diets were considered part of the fad diet trend. However, over the last ten years, numerous studies have been published supporting the importance of increasing protein while decreasing carbohydrate in the diet [7-11]. New research demonstrates that dietary protein intakes above minimum requirements (0.8 gram per kilogram body weight) can improve health by treating or preventing diseases such as obesity, osteoporosis, type 2 diabetes, metabolic syndrome and muscle loss [2].

For most adults, replacing some dietary carbohydrates, such as sugars and refined grain foods, with protein will result in favorable health outcomes – improved body composition, decreased cholesterol and improved blood glucose and insulin

levels. Recent research shows that approximately 30 grams of protein should be consumed per meal to see favorable health outcomes. Consuming this amount of protein has been shown to stimulate the body to build muscle protein, help you feel full and even increase the amount of energy expended at rest [4].

Diets with higher protein (30 percent of daily energy intake) and reduced carbohydrate (40 percent of daily energy intake) are beneficial for weight loss. Some weight loss studies report that diets higher in protein and lower in carbohydrates increase weight loss, increase loss of body fat and reduce loss of skeletal muscle mass [10]. It has been suggested that this is due, in part, to increased satiety after consuming a high-protein meal, resulting in decreased calorie intake.

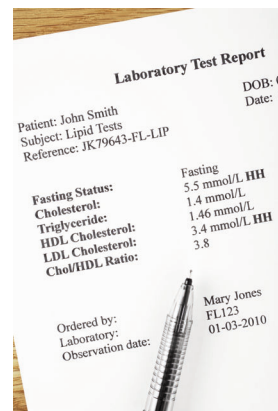
High-protein diets have also been shown to reduce serum triglyceride levels and increase HDL ("good") cholesterol concentrations. High-protein diets have also been shown to decrease blood pressure, a major risk factor for coronary heart disease. However, these effects are only observed with diets targeting weight loss [12].

Diets with increased protein and reduced carbohydrates have also been shown to improve regulation of blood glucose in healthy people and people with type 2 diabetes or obesity. After consumption of a higher protein diet, insulin and glucose responses after a meal were significantly lowered [12]. This indicates that eating a higher protein, reduced carbohydrate diet could be beneficial for treatment of the metabolic syndrome and type 2 diabetes.

How Do You Know Which Foods Are Good Sources of Protein?

Top Non-Vegetarian Sources of Protein [13]

- Beef flank – about 31 grams per 4 ounces
- Sirloin (beef) – about 34 grams per 4 ounces
- Chicken breast – about 30 grams per 4 ounces
- Ground beef – about 30 grams per 4 ounces
- Pork loin or tenderloin – about 29 grams per 4 ounces
- Haddock – about 27 grams per 4 ounces
- Lobster – about 25 grams per 4 ounces
- Ham – about 19 grams per 4 ounces



Top Vegetarian Sources of Protein

- Pumpkin seeds – about 34 grams per 4 ounces
- Chickpeas – about 21 grams per 4 ounces
- Mixed nuts – about 19 grams per 4 ounces
- Cottage cheese – about 15 grams per 4 ounces
- Quinoa – about 16 grams per 4 ounces
- Greek yogurt – about 12 grams per 4 ounces
- Tofu – about 10 grams per 4 ounces
- Black beans – about 6 grams per 4 ounces

Six Ways to Increase Dietary Protein Intake

- Incorporate eggs, low-fat cottage cheese, low-fat yogurt, Greek yogurt or low-fat milk into your breakfast.
- Eat snacks high in protein such as Greek yogurt, nuts, nut butters and seeds.
- Add small amounts of meat and beans or legumes to casseroles, pasta and soups.
- Eat meat several meals a week, but replace high-fat cuts of meat with lean meats.
- Incorporate more plants and vegetables that are high in protein in your diet (beans, barley, peas, broccoli, etc.).
- Eat fish several times a week.

References

1. <http://ensure.com/nutrition-articles/power-of-protein>
2. <http://eggnutritioncenter.org>
3. Academies, I.o.M.o.t.N., Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein and amino acids. 2002. National Academies Press: Washington, D.C.
4. Paddon-Jones, D., and B.B. Rasmussen, Dietary protein recommendations and the prevention of sarcopenia. *Curr Opin Clin Nutr Metab Care*, 2009. 12(1): p. 86-90.
5. Paddon-Jones, D., and H. Leidy, Dietary protein and muscle in older persons. *Curr Opin Clin Nutr Metab Care*, 2014. 17(1): p. 5-11.
6. Paddon-Jones, D., et al., Protein, weight management and satiety. *Am J Clin Nutr*, 2008. 87(5): p. 1558S-1561S.
7. Layman, D.K., et al., Dietary protein and exercise have additive effects on body composition during weight loss in adult women. *J Nutr*, 2005. 135(8): p. 1903-1910.
8. Layman, D.K., Protein quantity and quality at levels above the RDA improves adult weight loss. *J Am Coll Nutr*, 2004. 23(6 Suppl): p. 631S-636S.
9. Layman, D.K., and J.I. Baum, Dietary protein impact on glycemic control during weight loss. *J Nutr*, 2004. 134(4): p. 968S-973S.
10. Layman, D.K., et al., A reduced ratio of dietary carbohydrate to protein improves body composition and blood lipid profiles during weight loss in adult women. *J Nutr*, 2003. 133(2): p. 411-417.
11. Layman, D.K., et al., Increased dietary protein modifies glucose and insulin homeostasis in adult women during weight loss. *J Nutr*, 2003. 133(2): p. 405-410.
12. Layman, D.K., et al., Protein in optimal health: heart disease and type 2 diabetes. *Am J Clin Nutr*, 2008. 87(5): p. 1571S-1575S.
13. <http://www.bestfoodfacts.org/food-for-thought/power-of-protein>

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