

## Protein Requirements and Aging

The National Health Association (NHA) unequivocally recommends obtaining all your energy needs and nutrients exclusively from a whole-plant-food diet without added salt, oil, or sugar. Protein is a significant and crucial macronutrient of any healthy diet; it is constructed as a complex chain of amino acids, nine of which are essential and must come into the body in the food we eat. Proteins are important for a variety of life-supporting functions, including growth, repair, and the production of all hormones and enzymes.

Unfortunately, we live in a culture that embraces a philosophy that if something is good, more must be better. You have been sold the unconscionable idea that for you to be healthy, for you to even control your weight, it is necessary to eat huge amounts of protein, especially animal protein. Not only is this a glaring lie with no real scientific validity, it is potentially one of the most insidious foundations of the most devastating diseases affecting our culture today.

It should be emphasized that the optimal diet for health and weight regulation needs to have modest but adequate protein content, *without any animal protein*. In studies going back to the 1970s and '80s, when animals were exposed to known carcinogens, initiation and promotion of cancer was more prevalent in the animals on high-protein diets of animal origin than in those consuming high (or lower) amounts of plant-derived protein.<sup>1</sup> In addition, excessive protein also stimulates pro-aging pathways and premature aging in a wide range of species, including mammals. Since protein is built by amino acids, the acidifying influence of excessive

protein can engender metabolic acidosis that may promote damage, wear and tear, and debilitating inflammation. So, you need protein, but you need amounts within a well-defined range.

### Basic Protein Requirements

What is the window of need for protein, and what are the best sources? Many of the long-lived cultures on planet Earth take about 10–15 percent of their total energy and calorie needs from protein that is derived primarily from *plant sources*. In contrast, in industrialized nations like the U.S., a diet consisting of 30–40 percent of protein that is derived from *animal sources* is routinely promoted, both for basic needs and also for quick-fix weight loss. Consuming this type and quantity of protein puts your health future at risk.

For diets ranging from 1,500–2,500 calories per day for men or women, 10–15 percent would be approximately 40–90 grams of protein per day. Is that enough?

According to the National Academy of Science and the Food and Nutrition Board, which set the recommended dietary

allowances (RDA) in the United States, it is. The RDA for protein is 0.8 grams of protein per kilogram of body weight per day (0.36 grams per pound) to meet the needs of most of the adult population. For people weighing from 100–200 pounds, that means 36–72 grams of protein are needed to meet their daily requirement, which is easily obtained from the suggested 10–15 percent of calories.

### Optimal Protein Sources

Most people make the mistake of thinking that protein only exists in concentrated animal foods like meat, eggs, and milk and dairy products or in plant foods like nuts, soy products, and legumes (lentils and beans). In fact, protein exists in all foods. Nature doesn't make a piece of fruit or a leaf of lettuce without protein. Fruits including guava, kiwi, banana, and berries have 1–4 grams of protein per cup, so even foods that are not listed as high-protein foods can provide protein in your diet. Whole grains, vegetables, and greens are even more significant examples of foods typically described as low-protein foods that can make a substantial

contribution of protein to a whole-plant-food diet. This is especially true when they are consumed in the larger quantities typical of a diverse, plant-exclusive diet.

Beans and lentils (14–18 grams per cup), nuts and seeds (4–12 grams per ounce), oatmeal (8 grams per cup), and quinoa (which provides complete protein containing all the essential amino acids at 8 grams per cup) are valuable sources of plant protein. The following information from the United States Department of Agriculture (USDA) makes it clear that a variety of deep greens and veggies provides additional sources of protein with the added benefit of low calorie density. Data from the National Nutrient Database of the USDA show that a pound of broccoli provides 158 calories and 10.8 grams of protein; a pound of kale provides 128 calories and 8.6 grams of protein; and a pound of spinach provides 104 calories and 12 grams of protein, whereas a pound of beef sirloin contains 1,000 calories and 132 grams of protein. Remember, you only need 36–72 grams of protein per day. So, a pound or more of greens and vegetables per day in your diet, in smoothies, salads, and nutritious, vegan, whole-plant-food meals, would already provide 20–30 percent or more of your daily protein requirement while providing the lowest calorie density, which supports long-term health and weight regulation.

The combination and variety of whole plant foods work together to complement each other and provide all the essential amino acids that the body needs throughout the day without the devastating consequences of animal food consumption. The widespread dependence on animal-food supports the industries that have the greatest impact on the exaggeration of greenhouse gases that promote abnormal global warming/climate stress/drought, the killing and extinction of all species, and the dangerous disappearance of valuable land and water resources. In addition, consuming animal products exaggerates the ingestion of a variety of nutrients and toxic agents, including heterocyclic amines, heme iron, neuraminidase, trimethylamine-N-oxide (TMAO), methionine, arachidonic acid, oxidized cholesterol, saturated/trans fats, and oxidized lipotoxins that promote systemic inflammation, heart disease, obesity, diabetes, and cancer.

There is no reason to worry about your protein needs on a plant-exclusive diet. The largest land mammals on planet Earth (elephants, rhinos, hippos, giraffes) as well as our closely related nonhuman primates (bonobos, gorillas) maintain huge muscle mass and meet their protein requirements entirely from consuming plants. Most of the animal and dairy products that people consume come from cows, sheep, pigs, and goats that are also strict vegetarians who satisfy all of their energy and protein needs from plants. It makes no sense to harm and kill other species for the very nutrients that you can get more cleanly and directly from plant sources.

---

**The combination and variety of whole plant foods work together to complement each other and provide all the essential amino acids that the body needs throughout the day without the devastating consequences of animal food consumption.**

---

### Protein Needs Change with Age

It is important to recognize that your protein requirement may be altered as you get older. An evaluation of more than 11,000 adults ranging in age from 51–70+ suggested that dietary protein intake was significantly lower in older age groups and that 46 percent of these older adults were not meeting the RDA of daily protein intake. An even more significant decrease was seen in older adults with acute and chronic illness.<sup>2</sup> It has been suggested that the RDA for protein is substantially the same for all adults; however, older adults may be consuming less food as a result of decreased appetite, dental problems, impaired taste, swallowing issues, financial problems, and acute and chronic disease, which, combined with decreased digestive efficiency and utilization of protein, tend to increase the requirement of protein intake in the elderly compared to more active younger adults.<sup>3,4</sup>

To address these issues, a subsequent growing body of evidence has suggested that the RDA in older adults should actually be increased from the typical RDA of 0.36 grams per pound of body weight to 0.45–0.68, which would increase recommended protein intake to 67–100 grams for a 150-pound person.<sup>5</sup> Elder adults consuming 92 grams of protein a day had a 30 percent lower risk of loss of functional integrity associated with gait, speed, and grip strength, and significantly lower risk of falls, fractures, and frailty.<sup>6</sup> These benefits were particularly more evident in women than men. An international group suggested that older people need 0.45–0.54 grams of protein per pound of body weight to make up for age-related changes in protein metabolism, organ assimilation, and declining repair responses to ingested protein.<sup>7</sup> (Note, however, that people of any age with kidney damage or disease, especially older people, should limit their protein intake.)

### Lean Mass and Protein Intake in the Elderly

An age-related loss of muscle mass (sarcopenia) can develop as early as 40 years of age. Muscle strength can decline as much as 50 percent in older adults and contribute to an increased risk of falls and fractures.<sup>8</sup> By age 80, as much as 30 percent of muscle mass can be lost. Since muscles also store and harbor energy in glycogen reserves (the storage form of sugar), the loss of muscle mass can promote profound fatigue. Adequate protein intake combined with weight-resistance training can prevent the loss of muscle mass significantly. In a study done over a three-year period, older men and women (ages 70–79) consuming 91 grams of protein daily lost 40 percent less lean mass than those eating 50–60 grams a day.<sup>9</sup> Evaluation of over 72,000 older adults in a Framingham cohort study, when protein intake was increased from the typical RDA levels to 76 grams daily in women and 80 grams daily in men, showed a significant increase in the mass and strength of the quadriceps muscle (the thigh muscle that extends the lower leg).<sup>10</sup>

### Use of Protein Powders

The NHA strongly advocates increasing your consumption of greens, vegetables, whole grains, legumes, seeds, and nuts as

the best way to maintain or increase your protein intake. However, since injury and certain contingencies and complications of aging may increase the need for more protein intake, it can sometimes be difficult to satisfy an increased protein requirement from daily food intake alone. Under these conditions, the use of protein powder supplementation may have some limited value. A serving of most protein powders can provide an additional 20–30 grams of protein.

Typically, protein powders are made from plant-derived proteins (soybeans, peas, rice, potatoes, hemp seeds, and/or Lentein®) or proteins from animal products (eggs, milk/whey). Unfortunately, many commercial protein powders also contain added sugars, calories, artificial flavorings, thickeners, and even toxic chemicals that may increase digestive distress, weight gain, and other disease risks.<sup>11</sup>

A group called The Clean Label Project screened a variety of protein powders for 130 different toxins and discovered that many protein powders contain heavy metals (lead, arsenic, cadmium, and mercury); bisphenol-A (BPA), which is used to make plastics and the inner linings of canned food; and pesticides that are linked to a variety of cancers and other disease conditions.<sup>12</sup> As a result, a variety of health risks and dangers may be associated with the routine, consistent consumption of protein powders over time. Therefore, if you decide to add additional protein to your diet with protein powder, the NHA recommends using protein powder made from organic plant protein without any added sugar, salt, preservatives, or toxic additives.

### Timing of Protein Intake and Body Mass Index

The timing of protein consumption may be important for health, muscle mass, and function as you get older.<sup>13</sup> Spreading protein consumption out across the day may provide increased benefits for older adults. Since older adults are less efficient in processing protein, they may need larger amounts, as much as 20–25 grams, per meal. If the amount of protein you eat at a meal is too small, you may not adequately stimulate the uptake of amino acids into skeletal muscles. Muscle protein synthesis was 25% higher when the same daily quantity of protein was consumed across

the meals of the day instead of in large quantities at any one meal.<sup>14</sup> The more traditional, heavy-protein dinner may need to be replaced by an even, steady intake of protein throughout the day, starting with the first meal of your day.

In a national nutritional survey of over 24,000 older adults, highest protein intake was associated with the lowest body mass index and waist circumference, high values of which are significant risk factors for obesity, diabetes, and heart disease.<sup>15</sup> In addition, those who consumed higher amounts of protein had higher levels of HDL cholesterol and improved cardiometabolic health.

The NHA recognizes the importance of adequate protein intake from plant sources as essential to life and health. Consistent with the scientific evidence, the NHA suggests that while protein intake may need to increase with age, a consistent and increased consumption of vegetables and other plant foods throughout the day will more than adequately satisfy protein needs at any age and provide the best opportunity to support muscle mass, weight regulation, and cardiovascular health across time.

**Many commercial protein powders also contain added sugars, calories, artificial flavorings, thickeners, and even toxic chemicals that may increase digestive distress, weight gain, and other disease risks.**

#### REFERENCES

<sup>1</sup> Campbell TC, Campbell TM. *The China Study: The Most Comprehensive Study of Nutrition Ever Conducted and the Startling Implications for Diet, Weight Loss, and Long-Term Health*. Dallas, TX: Benbella Books; 2004.

<sup>2</sup> Krok-Schoen JL, Price AA, Luo M, Kelly OJ, Taylor CA. Low dietary protein intakes and associated patterns and functional limitations in an aging population: a NHANES analysis. *J Nutr Health and Aging*. 2019;23(4):338-347. doi: 10.1007/s12603-019-1174-1.

<sup>3</sup> Volpi E, Campbell WW, Dwyer JT, et al. Is the optimal level of protein intake for older adults greater than the recommended daily allowance? *J Gerontol A Biol Sci Med Sci*. 2013 Jun;68(6):677-81. doi: 10.1093/gerona/gls229.

<sup>4</sup> Young VR. Amino acids and protein in relation to the nutrition of elderly people. *Age Ageing*. 1990 Jul;19(4):S10-S24. doi: 10.1093/ageing/19.suppl\_1.s10.

<sup>5</sup> Paddon-Jones D, Campbell WW, Jacques PF, et al. Protein and healthy aging. *Am J Clin Nutr*. 2015 Jun;101(6):1339S-1345S. doi: 10.3945/ajcn.114.084061.

<sup>6</sup> Hruby A, Sahni S, Bolster D, Jacques PF. Protein intake and functional integrity in aging: The Framingham Heart Study Offspring. *J Gerontol A Biol Sci Med Sci*. 2020 Jan 1;75(1):123-130. doi: 10.1093/gerona/gly201.

<sup>7</sup> Bauer J, Biolo G, Cederholm T, et al. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from PROT-AGE study group. *J Am Med Dir Assoc*. 2013 Aug;14(8):542-59. doi: 10.1016/j.jamda.2013.05.021.

<sup>8</sup> Trombetti A, Reid KF, Hars M, et al. Age-associated declines in muscle mass, strength, power, and physical performance: impact on fear of falling and quality of life. *Osteoporosis Int*. 2016 Feb;27(2):463-71. doi: 10.1007/s00198-015-3236-5.

<sup>9</sup> Houston D, Nicklas BJ, Ding J, et al. Dietary protein intake is associated with lean muscle mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr*. 2008 Jan;87(1):150-5. doi: 10.1093/ajcn/87.1.150.

<sup>10</sup> Sahni S, Mangano KM, Hanna MT, Kiel DP, McLean RR. Higher protein intake associated with higher mass and quadriceps muscle strength in adult men and women. *J Nutr*. 2015 Jul;145(7):1569-75. doi: 10.3945/jn.114.204925.

<sup>11</sup> The hidden dangers of protein powders. Harvard Health Publishing, Harvard Medical School. August 15, 2022.

<sup>12</sup> Ibid.

<sup>13</sup> Rethinking protein needs for older adults. Gerald J and Dorothy R Friedman School of Nutrition Science and Policy. *Tufts Health and Nutrition Newsletter*. Updated September 17, 2019.

<sup>14</sup> Paddon-Jones D, Campbell WW, Jacques PF, et al. Protein and healthy aging. *Am J Clin Nutr*. 2015 Jun;101(6):1339S-1345S. doi: 10.3945/ajcn.114.084061.

<sup>15</sup> Pasiakos SM, Lieberman HR, Fulgoni3rd VL. Higher-protein diets are associated with higher HDL cholesterol and lower BMI and waist circumference in US adults. *J Nutr*. 2015 Mar;145(3):605-14. doi: 10.3945/jn.114.205203.