

Protein's Role in the Human Diet



Through the first half of the 20th century, preventing nutritional deficiencies was the focus of nutrition guidance from public health groups and government agencies. But that changed 40 years ago when public health policy shifted from what was not in the diet that should be, to what was in the diet that should not be. With more choices in the food supply, it became important to avoid the overfed/undernourished paradox.

In the 1977 Dietary Goals for the United States, published by the U.S. Senate's Committee on Nutrition and Human Needs, Americans were encouraged to increase their carbohydrate consumption and decrease their fat consumption to improve their health. The Dietary Goals failed to emphasize recommendations for protein consumption. Since then, Americans have adjusted their diets to follow this dietary advice – and have gotten fatter.

Protein seemed to be an afterthought. A growing body of evidence over the last two decades, however, demonstrates that more research focus on protein is needed, and increasing intake in some instances may be beneficial to health. Much of this evidence has been made possible through nutrition research funded by the Beef Checkoff Program.

Even before the mandatory Beef Checkoff Program was created the meat industry was weighing in on the topic. The industry first got involved during the 1920s when the National Live Stock and Meat Board, established in 1922, began a program funded by producers and packers to increase consumer understanding of the important nutritional role of meat in the diet.

Meat as a protein food constituted a large part of Meat Board-funded research in the early years. Over its first 60 years, in fact, the Meat Board funded almost 60 studies focused on protein and/or amino acids out of a total of 293 studies.

Legacy of Vernon Young

Significant research in the area of protein requirements and appropriate intake across population segments was conducted by a visionary scientist at the Massachusetts Institute of Technology named Vernon R. Young. In the 1960s, Young became the leading expert on protein and amino acid requirements and metabolism. By studying protein quality, synthesis, and breakdown in various populations, his research demonstrated that requirement levels for essential amino acids, widely accepted for 20 years, were too low. His findings ultimately affected global agricultural and health policy.

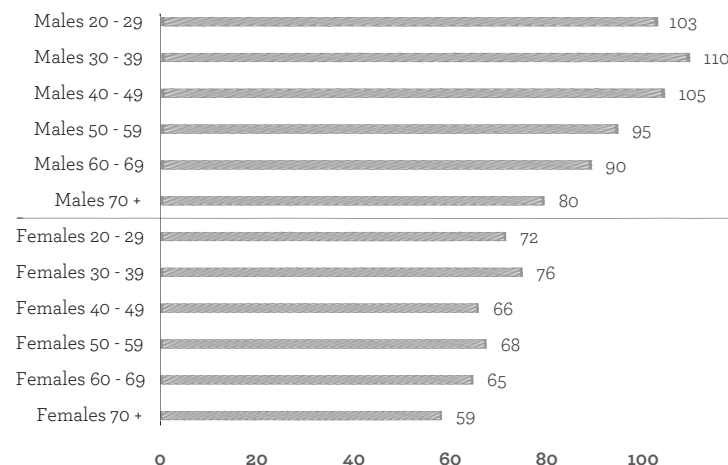
Young's research laid the groundwork for a renewed interest in protein, and many of the scientists he trained are now expanding the understanding of protein's role in health. He gave rise to an intriguing avenue of thought: Could an increase in protein be a critical factor in improving diets?

Protein food groups began collaborating at the turn of this century to move that discussion forward. A Protein Think Tank in May of 2006 convened to identify research needs for understanding the role of beef protein in promoting good health. This led to the first Protein Summit in 2007.

Protein Summits

The Summit, which took place May 23-24, 2007 in Charleston, S.C., was an international scientific effort with significant implications for protein research. More than 50 international protein researchers participated.

**Protein Consumption in Grams
by Gender and Age**



Source: *What We Eat in America, NHANES 2011-2012*,
www.ars.usda.gov/nea/bhnrc/fsrg

The consensus from this event was that research reinforced the importance of higher protein intakes to various health outcomes, such as weight management, diabetes, and cardiovascular disease. The researchers also noted the potential benefits of protein for various population groups, including older people in need of maintaining lean body mass. The proceedings from the Summit were published in a supplement consisting of eight papers in the May 2008 issue of the *American Journal of Clinical Nutrition*.

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Summit proceedings suggested that while previous research uncovered important evidence necessary for assessing protein's value across life stages, more research was needed. The report of positive research findings at the Summit, along with the identification of opportunities for even more promising research outcomes, further renewed industry interest in the positive health role for beef protein.

Protein Summit 2.0 on October 2-3, 2013, co-sponsored by the Beef Checkoff Program, Dairy Research Institute, Egg Nutrition Center, Global Dairy Platform, Hillshire Brands and National Pork Board, assessed advances in protein research since the 2007 Summit and determined further research needs to better understand dietary protein's impact on human health.

More than 50 international nutrition scientists, health experts and nutrition educators joined the eight-member steering committee to discuss dietary protein's role in weight management, metabolic activity, healthy aging, and establishing a foundation to build more healthful diets within energy (calorie) goals.

It was noted in the introduction to the second summit that, since the 2007 Summit "the scientific literature has expanded with research indicating that higher-protein intakes contribute to better diet quality, healthy weight management, improved body composition, and maintenance of, or increase in, lean body mass for certain populations." Furthermore, the proceedings from the first event had been downloaded more than 70,000 times.

Proceedings from the 2013 Summit were published in a supplement consisting of six papers in the June 2015 issue of the *American Journal of Clinical Nutrition*.

Building on What's Known

Each research project conducted provides additional knowledge, but like most research leaves questions unanswered and avenues open for further exploration. The progress being made in this area, however, should not be overlooked.

For more than 90 years, the industry has invested in critical research to increase knowledge about the nutritional properties of beef and the benefits it provides to the diet. Much of the progress made in understanding the benefits of dietary protein is directly attributable to the research funded by beef producers through their Beef Checkoff Program.

Nutrition research also provides a foundation for beef checkoff-funded education and information programs. In fact, scientific assessments of the value of beef products to human health have been a cornerstone of beef industry outreach success for nearly a century. But the future of the beef industry depends on continuing this commitment. With a topic as multifaceted as optimal human nutrition, the questions surrounding the role of protein continue to outnumber the answers, thus making the investment in nutrition research as critical as ever.

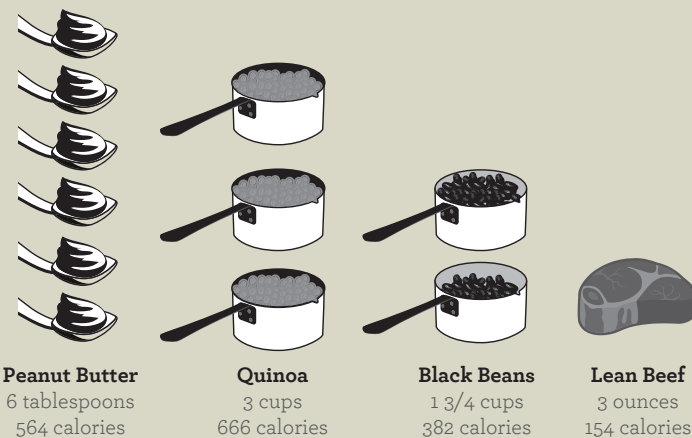
What is Protein?

The basic building blocks of protein are amino acids. The human body uses amino acids to make proteins to help the body perform many bodily functions including growth, transport and storage of nutrients, repair of body tissues (especially in the muscles, bones, skin and hair), as well as the removal of all kinds of waste deposits. Amino acids are also a source of energy.

The essential amino acids (EAA) cannot be synthesized in the body, and must be supplied from the diet. Generally, plant proteins, when eaten alone, do not contain all of the EAA in sufficient quantities and, therefore, are incomplete. Animal proteins contain all nine EAA and are considered a complete, high-quality protein source.

While protein can be found in both plant and animal foods, animal-based proteins (meat) have been shown to be more bioavailable and, therefore, are more readily useable by the body than the plant proteins. In addition protein from plants are often less digestible, thus less useable.

Considering the challenge of meeting all nutrient needs within the calorie allowance allotted by age, gender, and activity level, animal proteins are an efficient way to meet protein needs. For example, a 3-ounce serving of lean beef provides 25 grams of protein in just 154 calories. It would take 6 tablespoons of peanut butter (564 calories) or 1 3/4 cups of black beans (382 calories) to provide the same amount of protein.



US Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. USDA National Nutrient Database for Standard Reference, Released May, 2015, www.ars.usda.gov/ba/bhnrc/ndl

The Recommended Dietary Allowance (RDA) for protein for healthy individuals, 0.8 g/kg of body weight (0.36 grams per pound of body weight) per day, is derived by estimating the amount of protein needed to maintain nitrogen balance for the average adult. The RDA has remained unchanged for 70 years. 