

# Protein Summit: consensus areas and future research<sup>1-4</sup>

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## INTRODUCTION

The goal of the Protein Summit was to bring a variety of researchers in the area of human protein metabolism together to evaluate and discuss factors relevant to current and future dietary guidelines for protein intake in the United States and Europe. A series of topics were discussed in depth, as reflected by the accompanying manuscripts in this supplement. From these discussions, certain central points evolved that reflect the majority opinion of those in attendance. These points will be referred to as areas of consensus, although a process to formally document the extent of consensus was not undertaken. Areas for which no clear consensus could be attained form the basis for future areas of research. The rather narrow scope of areas of consensus and correspondingly broad topics for future research reflect the fact that the optimal level of protein intake for maximal health and function remains uncertain. The Dietary Guidelines did not directly address the issue of protein, much less its role in optimal health. They state: "While protein is an important macronutrient in the diet, most Americans are already currently consuming enough and do not need to increase their intake. As such, protein consumption, while important for nutrient adequacy, is not a focus of this document" (2). Given the importance of this crucial macronutrient and the emerging data documenting the health benefits when consumed in amounts greater than the Recommended Daily Allowance of 0.8 g/kg/d, determining the optimal level of protein intake should have high priority in nutrition research and in the establishment of dietary guidelines for the population.

## AREAS OF CONSENSUS

1) The Recommended Daily Allowance (RDA) of protein promulgated by the Food and Nutrition Board of the National Academy of Science in the Dietary Reference Intakes for macronutrients (1) and accepted by the US Department of Agriculture Dietary Guidelines Committee (2) of 0.8 g protein/kg/d is a reasonable estimation of the minimal amount of protein intake needed to maintain nitrogen balance (N-balance) in healthy young adults. This value may be inadequate as even a minimal value for active adults or the elderly.

2) The N-balance does not have a direct correlation with functional outcomes and therefore is not the most appropriate endpoint for the determination of the optimal level of protein intake considered in the context of the overall diet. Parameters related to muscle mass, strength, and metabolic function are more relevant endpoints. N-balance was chosen as the endpoint for

determining the RDA largely because of the prevalence of available data.

3) The optimal level of protein intake is >0.8 g protein/kg/d. The current RDA for protein is actually <10% of normal caloric intake, which is less than the low end of the range of the acceptable macronutrient distribution range recommended in the Dietary Reference Intakes (10–35% of calories) (1) and less than the amounts of protein recommended in the dietary guidelines (2). The amount of dietary protein that could be characterized as optimal is uncertain.

4) Protein intake can be increased to at least double the RDA, and perhaps higher, without risk of adverse responses in healthy individuals with normal renal function.

## AREAS OF FUTURE RESEARCH

1) The response of muscle mass, strength, and metabolic function to various levels of protein intake.

2) The interactions between the amount of protein intake and corresponding changes in the other macronutrients. Raising the relative amount of protein intake by necessity reduces the amount of carbohydrate and/or fat in the diet, with resultant consequences not only on muscle but other body systems.

3) The role of dietary protein, per se, in controlling diabetes and in weight management.

4) The relation between the level of protein intake and bone health. Related to this topic is whether changes in muscle strength and function mediate the effect of protein intake on bone.

5) The relation between the pattern of protein intake over the course of the day and the functional response of muscle.

6) The evaluation of differences in the quality of individual proteins. Critical to this issue is the selection of an appropriate endpoint as it is impractical to use N-balance to discern differences.

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<sup>2</sup> Presented at the conference "Protein Summit 2007: Exploring the Impact of High-Quality Protein on Optimal Health," held in Charleston, SC, May 24, 2007.

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## DISCUSSION

Current guidelines for protein intake have identified a minimal level of protein intake (the RDA) that is likely suboptimal in the context of a complete diet and favorable outcomes. A distinction between the minimal acceptable intake and the optimal level of intake would be useful. The central unanswered question is, how much is the optimal amount of protein intake? Certainly, a single research approach will not identify a specific number. Rather, a variety of factors should ultimately be considered when deriving new nutritional guidelines for protein intake, many of which will be clarified only once the research topics described above are addressed.

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## REFERENCES

1. Food and Nutrition Board, Institute of Medicine. Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids (macronutrients). Washington, DC: National Academy Press, 2002. Internet: <http://www.nap.edu/books/0309085373/html/2002> (accessed 19 June 2006).
2. US Departments of Health and Human Services (USDHHS) and Agriculture (USDA). 2005 Dietary guidelines for Americans. 6th ed. Washington, DC: US Department of Health and Human Services, 2005.

