

## Misinformation on Plant Proteins

*To the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association:*

The June 25, 2002, issue of the journal *Circulation* printed a letter of mine<sup>1</sup> in which I corrected a statement made by the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association.<sup>2</sup> This report states, "Although plant proteins form a large part of the human diet, most are deficient in 1 or more essential amino acids and are therefore regarded as incomplete proteins." This statement is not correct, as I have clearly shown in my letter.

Accompanying my letter was a response from Barbara Howard, PhD,<sup>3</sup> who, I assume, represents the Nutrition Committee. Her letter was confusing and undocumented by a single scientific citation. However, rather than admit the Committee's report was in error, she reaffirmed their previous position by writing "...we did carefully state that 'most' are deficient in one or more essential amino acids. ..."

Failure to resolve the truth about the adequacy of plant proteins threatens the health of millions of people seeking better guidance for proper nutrition; therefore, my efforts will not be dismissed with a careless response from the Nutrition Committee of the American Heart Association. Please grant me the courtesy of a professional and honest answer by either:

- (1) Showing me that I am incorrect by citing scientific research that contradicts my position and the studies I have provided. These scientific papers accompanying my letter represent the original experiments performed to determine human protein needs. I will not accept someone else's professional opinion on this issue—because, as you know, even the "best experts" can be wrong. Show me the basic research—as I have done for you.
- (2) Admitting the article by the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association<sup>2</sup> contains incorrect information concerning the adequacy of plant proteins. And giving this matter the serious, open attention it deserves.

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1. McDougall J. Plant foods have a complete amino acid composition. *Circulation*. 2002;105:e197. Letter.
2. St Jeor ST, Howard BV, Prewitt TE, et al, for the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. Dietary protein and weight reduction: a statement for healthcare professionals from the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. *Circulation*. 2001;104:1869–1874.
3. Howard BV. Response. *Circulation*. 2002;105:e197. Letter.

## Response

We appreciate Dr McDougall's commitment to vegetarian diets, and we believe we have stated clearly in both our original advisory on protein intake<sup>1</sup> and in our response<sup>2</sup> to his first letter<sup>3</sup> that the American Heart Association (AHA) is not opposed to vegetarian diets. A diet that is based on the AHA guidelines of 5 to 6 or more servings of whole grains and 5 or more servings of vegetables and fruits can serve as the foundation for a healthy vegetarian diet that can supply all of the amino acids necessary for well-being. However, because 6 servings of grains and 5 servings of fruits and vegetables would provide roughly only 25 g of protein, additional servings of breads, cereals, and other complex carbohydrates and fruits and vegetables will be necessary to meet

protein requirements. Inclusion of legumes, soy products, and nuts will facilitate meeting protein and calorie needs of a vegetarian diet.

We must, however, stress that the evaluation of protein quality is complex, and understanding dietary protein requirements for humans continues to be a focus of research. Much scientific progress has been made and is still ongoing since the work done by Rose in the 1950s.<sup>4</sup> More recent studies indicate that the evaluation of protein quality must consider the biological value or protein efficacy ratio, which is a measure of protein retention or utilization by the body, the chemical score based on its essential amino acid content, and protein digestibility or availability of the individual amino acids.<sup>5</sup> An example of research in the field that has recently added to our knowledge of the human lysine requirement and the nutritional value of wheat protein is the demonstration of an adaptive capacity in some individuals that allows wheat protein to be utilized more efficiently than expected.<sup>6</sup> Numerous other studies have been reported, but it is beyond the scope and purpose of this letter to summarize and document their findings. As a start, we refer the reader to the article by Young and Pellett<sup>5</sup> that provides 50 references and concludes that a "mixture of plant proteins can serve as a complete and well-balanced source of amino acids for meeting human physiological requirements." Additionally, an article by Millward<sup>7</sup> summarizes 59 articles and reviews the "meat or wheat debate" and concludes that plant-based diets (but not one food) can supply protein in the amount and quality needed. Furthermore, there are several micronutrients that may be limited in diets without animal proteins—not just vitamin B<sub>12</sub>, as Dr McDougall mentions in his letter, but also calcium, zinc, and omega-3 fatty acids.

As all groups involved in nutrition counseling have pointed out, it is possible to achieve adequate nutrient intake on a vegetarian diet, but it requires careful planning to include plant sources that provide adequate amounts of all amino acids and the above listed micronutrients, and some special consideration for vitamin B<sub>12</sub>. The AHA guidelines are meant to be applicable to all adults in the US population, where average consumption of vegetables/fruits is only about 3 servings per day and whole grain intake is also lower than recommended at 6 servings per day.

We don't want individuals to be unnecessarily concerned about vegetarian diets, but we do want to be sure that they receive appropriate guidance to assure that nutrient intake meets their needs and that nutrients are derived from whole foods rather than from supplements.

**Barbara Howard, PhD, on behalf of the AHA Science Advisory Committee**

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1. St Jeor ST, Howard BV, Prewitt TE, et al, for the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. Dietary protein and weight reduction: a statement for healthcare professionals from the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. *Circulation*. 2001;104:1869–1874.
2. Howard BV. Response. *Circulation*. 2002;105:e197. Letter.
3. McDougall J. Plant foods have a complete amino acid composition. *Circulation*. 2002;105:e197. Letter.
4. Rose, W. The amino acid requirement of adult man. *Nutr Abst Rev*. 1957;27:631–647.
5. Young VR, Pellett PL. Plant proteins in relation to human protein and amino acid nutrition. *Am J Clin Nutr*. 1994;59(suppl):1203S–1212S.
6. Millward DJ, Fereday A, Gibson NR, et al. Human adult amino acid requirements: [1-13C] leucine balance evaluation of the efficiency of utilization and apparent requirements for wheat protein and lysine compared with those for milk protein in healthy adults. *Am J Clin Nutr*. 2000;72:112–121.
7. Millward DJ. The nutritional value of plant-based diets in relation to human amino acid and protein requirements. *Proc Nutr Soc*. 1999;58:249–260.