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What Is Dietary Fiber?

Dietary fiber is part of a fascinating evolution involving all aspects of food science and technology and nutrition. Our knowledge of dietary fiber increases and changes almost daily, leading us to ask, Just what is “dietary fiber”?

For instance, our understanding of the chemistry of new poly-, oligo-, and monosaccharides and their use in foods is accumulating. These compounds are important because they invoke positive physiological changes in the body similar to the effects of dietary fiber in fruits, vegetables, and cereals. However, the classical and current definitions of dietary fiber do not embrace some of these new compounds. So how should these compounds be included as part of the definition? What is dietary fiber in terms of physiological functions, disease prevention, and public health?

Currently, methods other than the AOAC method for measuring total dietary fiber are used to include particular soluble oligosaccharides in content declarations. The nutrition labeling of foods for calories and total carbohydrates, structure–function claims, and health claims are aspects of our national nutrition education efforts that could be enhanced with a consensus definition of dietary fiber. Most important, an up-to-date definition of dietary fiber could promote consumption of more dietary fiber–rich foods. Foods and diets rich in dietary fiber promote healthy lifestyles and reduce health costs. However, while the importance of dietary fiber in human health is increasing, per capita consumption remains constant at approximately half the recommended 25 g/day.

The original definition of dietary fiber proposed by British scientists Burkitt, Painter, Trowell, and Walker in the early 1970s was “that portion of food which is derived from cellular walls of plants which is digested very poorly by human beings.” These pioneers suggested that increased consumption of dietary fiber could prevent many diseases and physiological disorders. Conversely, individuals with inadequate intakes of dietary fiber are more prone to the diseases of Western civilization. These statements are now considered to be facts.

Subsequent interest in adding dietary fiber to foods precipitated the need for methods to measure dietary fiber. In 1985, the Food and Drug Administration and the U.S. Dept. of Agriculture approved the AOAC method for measuring dietary fiber. AOAC’s description of this method defines dietary fiber as “the food material that remains after *in vitro* digestion with

two amylases and one protease and precipitates in 78% alcohol minus the fat, protein and ash in the precipitate.”

However, the AOAC method fails to recover and measure many lower-molecular-weight saccharides. For example, fructooligosaccharides—“prebiotic” compounds used by the gut microflora for growth and maintenance—are proving to be highly beneficial in maintaining healthy intestinal microflora, but they are not recovered and measured by this method.

Dietary fiber was redefined in 1976 by Trowell et al. (Lancet a: 967) as “the remnants of edible plant cell, polysaccharides, lignin, and associated substances resistant to (hydrolysis) digestion by the alimentary enzymes of humans.” This definition, despite 23 years of debate, serves us today. But is this definition complete? Many new dietary fiber ingredients are not derived from “plant cell walls”—the next-generation dietary fiber could be synthetically produced and modified materials.

Does this definition completely satisfy consumers, food and health professionals, food and food ingredient companies, and regulatory agencies? Is dietary fiber a mixture of food compounds, a hypothesis, or a value resulting from an analytical method or methods? Should the definition of dietary fiber encompass these three ideas and newer knowledge? What do you think?

These and related topics will be the focus of discussion during a special forum at the Institute of Food Technologists’ Annual Meeting in Chicago, Ill., on Monday afternoon, July 26, 1999. The forum, entitled “Defining Dietary Fiber,” is cosponsored by IFT and the American Association of Cereal Chemists. The goal of the forum is to develop a consensus definition for dietary fiber. Please attend this forum and present your opinions. The benefits of considering and adopting a consensus definition for dietary fiber are numerous. An up-to-date definition will help foster advances in methods development, which will facilitate new food product development.

Every person having any association with the use of dietary fiber in foods, nutrition, and public health is invited to provide comments at the forum or through the AACCC Web site at www.scisoc.org/aacc. We welcome your input. ●

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