

# The Evolution of Dietary Fiber Definitions and Methods and the Role of AACC International

Barry V. McCleary, AACC International President and Dietary Fiber and Other Carbohydrates Technical Committee Member  
Megazyme Intl. Ireland Ltd., Ireland



The differentiation between “available” and “unavailable” carbohydrates by McCance and Lawrence in 1929 may be regarded as a milestone in our understanding of the nutritional importance of different food carbohydrates. The term “dietary fiber” was first used by Hipsley in 1953 to describe plant cell walls in the diet that he thought protected against toxemia associated with pregnancy. Trowell revived the term in 1972–1974 and defined it as “the skeletal remains of plant cells that were indigestible.” In 1976, it was redefined by a group of scientists to include polysaccharides and lignins that are not digested in the small intestine. Burkitt and colleagues hypothesized that many diseases common in and characteristic of modern Western civilization, such as coronary heart disease, diabetes, and some cancers, may be related to the amount of time needed for the passage of intestinal content through the alimentary tract, which in turn has been shown to be greatly influenced by the fiber content of the diet and by the amount of cereal fiber in particular.

New research published by Park and colleagues in the *Archives of Internal Medicine* shows the strong health benefits of dietary fiber, specifically dietary fiber from grains. The new report “Dietary Fiber Intake and Mortality in the NIH-AARP Diet and Health Study” shows a significant decrease in the deaths of individuals whose diets were high in dietary fiber. More specifically, it was found that dietary fiber intake lowered the risk of death from cardiovascular, infectious, and respiratory diseases by 24–56% in men and 34–59% in women.

Clearly, we as cereal chemists, processors, and manufacturers need to promote the benefits of cereal fiber to consumers, regulators, and granting bodies. We need to continue to focus on developing tasty, health-promoting food options that are rich in cereal grains and fibers. For most population subgroups, <10% meet the fiber ingestion requirement. The “Dietary Guidelines for Americans 2010 Policy Document” identifies dietary fiber as one of the shortfall nutrients in the diets of Americans. In a follow-up paper to that of Park and colleagues, de Koning noted that whole grains contain antioxidants and minerals that may help reduce health risks. They suggest that the appropriate public health recommendation should be to increase consumption of whole grains at the expense of refined grains.

AACC International offers many resources on dietary fiber, including the creation of a definition and comments proposed to various health agencies. Most recently, comments were provided to the Nutrition Evaluation Division of Health Canada regarding its proposed definition of dietary fiber. Recent AACC Intl. publications include the new *Oats: Chemistry and Technology* book, which features information on  $\beta$ -glucans, and the new *Dietary Fiber: New Frontiers for Food and Health*, which covers up-to-date information on many areas of dietary fiber, including fiber and health and glycemic response. AACC Intl. members have also been active over the past 30 years in development and validation of dietary fiber measurement methodology. In line with the recently adopted (2008) definition of total dietary fiber by Codex Alimentarius, a new integrated total dietary fiber method was developed by AACC Intl. members and validated through both AACC Intl. (Method 32-45.01) and AOAC International (Method 2009.01). This method has just received Type I classification by the Codex Committee on Methods of Analysis and Sampling (CCMAS) in Budapest (March 2011). This is the only dietary fiber method that allows accurate measurement of all dietary fiber components, including resistant starch and nondigestible oligosaccharides. AACC Intl. members were present at this meeting to respond to specific questions from delegates. At this meeting, many of the other AACC Intl. dietary fiber methods, including those for particular dietary fiber groups or specific dietary fiber components such as  $\beta$ -glucan, fructan, and resistant starch, also were accepted as Type I, II, or III methods.

AACC Intl. remains active in the areas of dietary fiber definition, analysis, and formulation in consumer-friendly food products. In fact, a new workshop, Cereal Chemists Working with Fiber, will be held during the upcoming 2011 AACC Intl. Annual Meeting on Sunday, October 16, from 1 to 4:00 p.m. This workshop is designed to provide a detailed overview of the evolution of fiber methods, emphasizing recent developments in methodology, definition, and labeling of dietary fiber. Workshop speakers include myself, Jon DeVries (Medallion Laboratory), Edward Souza (USDA-ARS, Wooster), and Susan Gebhardt (USDA-ARS, Beltsville). We look forward to seeing you at this year’s annual meeting—our association’s hub for bringing together researchers from across the globe to address these cutting-edge issues and more.