

Closing remarks

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Introduction

Dr Kritchevsky introduced this symposium by reviewing subject matter from the first five Vahouny Dietary Fiber Symposia. His goal in doing so was to show how the science of dietary fiber research has become progressively more sophisticated over the years. These closing remarks continue with this theme and suggest that the results of continuing research in this field will require that we expand and modernize our view of dietary fiber. Appropriately, in the first paper of the 1st Vahouny Symposium held in 1981, Dr David Southgate proposed ideas for 'Definitions and Terminology of Dietary Fiber'. This task is still before us.

Background

Research presented at the 1st Vahouny Symposium in 1981 utilized: (i) chemical analyses of intestinal contents of animals and stool contents of humans; (ii) analyses of food intakes, transit times and stool outputs; and (iii) measurements of the effects of dietary fiber on nutrient absorption. Despite the limitations of these methodologies, a base knowledge of dietary fiber physiology was built.

The 2nd Vahouny Symposium, held in 1984, focused more on the effects of dietary fiber in various diseases and medical problems. To set the stage for this meeting Dr Denis Burkitt began his forward with the following comment: 'Only 15 years ago a conference on dietary fiber, let alone an international conference, would have been considered an extremely unlikely, and in fact an unthinkable, event.' At this meeting, researchers began to report effects of dietary fiber on diabetes, colon cancer, lipid metabolism, obesity, and other disease conditions.

Methodologies used in this research included analyses of short chain fatty acids; glycemic response and serum glucose control; mucosal cell turnover; gastrointestinal microflora; bile acids and other new approaches.

In 1988, the 3rd Vahouny Symposium continued the focus which had begun in 1984 and featured a 1-day satellite session entitled 'Future Directions in Research on Dietary Fiber and Cancer', sponsored by the National Cancer Institute. Some of the methodologies reported at this meeting included the evaluation of satiety and obesity; ileal brake and nutrient absorption; fecal mutagens and cancer; and adenomatous polyps and cancer.

The program of the 4th Vahouny Symposium, conducted in 1992, began to look into new research areas such as the energy value of fiber; lipid absorption and cholesterol lowering effects; fiber and dietary oestrogens; and protective mechanisms of fiber and cancer. A highlight of this meeting was the addition of unstructured workshops that provided a

venue for exchange of information by conference participants on developing new technologies in this field. Dr Martin Eastwood closed this meeting by discussing 'Future Research in Dietary Fibre?'. He summarized a number of basic questions which remained to be answered in order to understand the action of dietary fiber in nutrition, and challenged dietary fiber scientists to develop the more sophisticated methodologies which were required to answer these questions.

The most recent Vahouny Symposium, conducted in 1996, featured half-day sessions on 'Complex Carbohydrates' (sponsored by the International Life Sciences Institute), 'Soluble Fiber', 'Short Chain Fatty Acids', and 'Nutrients Contributing to the Fiber Effect'. Reports presented at this meeting showed that many of the nutrients that contributed to the fiber effect (such as resistant starch, oligosaccharides, fructo-oligosaccharides, lignans, etc.) were fermented to short chain fatty acids and/or contributed to similar health benefits as did nutrients considered to be traditional dietary fiber materials.

Discussion

In the past 15-20 years, the field of dietary fiber research has evolved from basic techniques measuring empirical or semi-empirical methodologies, such as evaluating transit times or counting number and/or size of bowel movements, to more sophisticated technologies such as measuring cytokinetics, molecular biology, cytopathology, and the effects of dietary fiber metabolites. The knowledge issuing from this research will require that we address two developing and interrelated trends. Dietary fiber science will have to come to grips with, firstly, how we define and categorize various dietary fiber materials, and secondly, how we establish new government regulations to provide useful labeling of consumer products.

Advances in dietary fiber science are being paralleled by advances in food technology. These advances in food technology are resulting in the synthesis and/or extraction of new food ingredients and the development of new food products that have similar physiological effects to nutrients that are traditionally regarded as fitting the dietary fiber definition. Thus, definition and categorization of these new food ingredients and food products will have to be addressed. These

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new categories will then have to be incorporated into new regulations issued by the government organizations that are responsible for such food regulations.

Conclusion

I would like to propose two ideas for addressing both of the trends in dietary fiber science. Firstly, a more expansive and modern definition of dietary fiber will need to be formulated. In the past, only agricultural and analytical chemistry concepts were used to define and categorize nutrients, particularly dietary fiber. In today's society, the lay literature is replete with articles expounding the health benefits of dietary fiber. This literature is also speaking to a more well-educated and affluent society, and motivated consumers who follow this literature try to shop for products that they think will provide the health benefits discussed in these articles. Thus, in many countries there is a growing trend towards classifying dietary fiber products based on health functionality (e.g. health claims). The result is a growing challenge to develop a more consumer orientated definition of dietary fiber based on functionality rather than on solely agricultural and/or analytical chemistry concepts.

In order to accommodate this trend, we might consider a dietary fiber categorization system similar to the one used in classifying ethical pharmaceutical products. For instance, a particular group of pharmaceuticals are defined as antihypertensives based on their physiological function rather than on their chemical structure. This group is then further subcategorized based on mechanism of action: for example, ACE inhibitors, beta blockers, calcium channel blockers etc. In addition, certain antihypertensives have been found to be multifunctional. They not only act as antihypertensives but may also be effective in the treatment of end-stage renal disease.

A similar categorization could be developed for dietary fiber products based on functionality in treating or preventing disease conditions. Some dietary fiber materials/products are effective in preventing and treating constipation while other dietary fiber materials help in lowering serum cholesterol. However, where certain dietary fiber materials are mul-

tifunctional in that they are effective in treating both constipation and in lowering serum cholesterol, they are still categorized as dietary fiber materials. Unfortunately, our current definition of dietary fiber and our current product labeling does not allow us to present such concepts to the consumer. The result has been considerable confusion in the lay press and in product labeling. By developing a categorization/definition system based on health functionality we may be able to address both of these issues.

The second idea I would like to propose is the development of a new system for defining and categorizing dietary fiber materials in product labeling. Consumers need products that are properly labeled and carry information that is more consumer friendly. Motivated consumers who read about the various health benefits of various dietary fiber materials should be able to find dietary fiber products which are clearly labeled and easily understood. Most consumers have a limited understanding of agricultural or chemical terminology and thus definitions based on this terminology are not so helpful. A system based on health functionality would be more informative.

A system based on defining dietary fiber products based on functionality would require that manufacturers and suppliers of such products conduct well-controlled studies in order to demonstrate that their particular product actually produces the health benefit that they want to claim in their product labeling. These studies would then need to be sent to government organizations for review and approval. Eventually, as more information is accumulated, product monographs might be developed for each functional use so that all companies wanting to distribute a particular product identical to one in the monograph would only need to show that the product is comparable to products approved in monographs.

This, of course, means that government agencies would be required to develop a comprehensive categorization system based on functionality, as well as a system of monographs for registering products about which manufacturers want to make health claims in their labeling. The development of such a system could be a joint governmental, academic, and industry effort.