Introduction to and Perspectives from the Fifth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease

Mark Messina,2 John Erdman, Jr.,* and Kenneth D.R. Setchell†

Nutrition Matters, Inc., Port Townsend, WA 98368 and Loma Linda University, Loma Linda, CA 92350; *Department of Food Science and Human Nutrition, University of Illinois, Urbana, IL 61801; and †Department of Pediatrics, Children’s Hospital and Medical Center, Cincinnati, OH 45229

The proceedings from the First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease were published in this journal in 1995. For a decade this symposium has been the seminal gathering place for investigators and health professionals to discuss the latest research on the health effects of soy foods and soybean constituents.

The conference this year attracted nearly 300 participants from 20 different countries. In total there were ~200 oral and poster presentations. Certainly, this volume of research attests to the continued interest in soy and to the number and variety of laboratories working in this area. Although many questions regarding health effects remain unanswered, the extensive research underway provides cause for optimism that over the ensuing years some answers will become clear, or at least sufficiently clear so as to provide the foundation for conducting long-term randomized clinical trials that use clinical outcomes such as fractures and coronary events as endpoints.

These trials are needed to definitely establish both efficacy and safety, although the long history of Asian soy food use and the existing literature of human clinical trials certainly support the latter. Not surprisingly, research into the health effects of soy in humans has consisted of mostly short-term trials involving relatively few subjects. Such studies have generally used intermediate markers of risk. A few small multiyear trials have also been conducted, and several large multiyear randomized clinical trials in the bone area are in progress.

The nutrition literature is not without inconsistencies, and soy is no exception. There are many obvious reasons for the variation in study results, but one discussed throughout the symposium and addressed in part by Erdman et al. in these proceedings is the varied composition of soy products used in research. It is self-evident that differences in chemical composition among the different soy products can affect biological activity; however, the extent to which these products differ chemically may not have been previously appreciated. Clearly, isoflavone supplements devoid of protein differ from isoflavone-rich soy protein products, but isoflavone supplements can also differ markedly in their isoflavone profile and soy protein products differ markedly in their isoflavone content.

Preliminary evidence presented at this symposium suggests that commercial processing of the soybean affects the structure of soy protein and the products of its intestinal digestion in humans. The significance of these observations is clear when considered along with emerging research suggesting that peptides of fairly long length can be absorbed and exert effects in vivo. For health outcomes thought to be primarily affected by soy protein, such as cholesterol reduction, it now seems important to establish how processing affects biological activity.

It should be noted that most of the clinical research supporting health benefits of soy has involved the use of commercially processed soy proteins and not traditional soy foods. Recent research indicates that soy peptides can now be added to the list of potential bioactive components of soy. Peptides from proteins other than soy are also under investigation and we could ask whether intensified efforts on the effects of processing on the protein structure of other food proteins are warranted.

Two other perspectives with potentially important implications for understanding the health effects of soy foods were discussed at this symposium. One was the issue of the variable actions of intestinal microflora on isoflavone glycones and their subsequent absorption and metabolism. Differences in microflora can markedly affect the amounts and types of isoflavones found in body tissues from person to person. Some of the inconsistencies reported in the literature may result from these differing serum isoflavone levels. Most importantly, only 30–50% of the adult population possesses the intestinal bacteria capable of converting the soybean isoflavone daidzein into the isoflavonoid equol. Intriguing but still quite speculative data suggest that equol production is advantageous. Certainly, equol appears to have a number of unique actions. One recommendation from the symposium is that researchers consider analyzing data from studies according to equol status and consider stratifying subjects according to equol status when...
designing new studies. Significant data available for retrospective analysis may already exist. Researchers were encouraged to address this issue using their raw data.

The other perspective, which is discussed by Barnes in these proceedings, is the convention of referring to isoflavones as phytoestrogens. Isoflavones bind to estrogen receptors and exert estrogen-like effects under some experimental conditions, but it is quite clear that the biological effects of isoflavones differ markedly from estrogen. The biological activity of estrogen-receptor ligands can vary significantly from tissue to tissue and therefore needs to be evaluated individually. Furthermore, isoflavones have potentially important nonhormonal properties. Suffice it to say that conclusions about the health effects of soy foods or isoflavones, good or bad, should not be made on the basis of our knowledge of estrogen action.

This year Dr. Stephen Barnes from the University of Alabama and Mr. William Shurtleff from the Soyfoods Center in Lafayette, California, received the Lifetime Soy Achievement Awards. Dr. Barnes has been at the forefront of soy research since his first publication in this area in 1990. He and his laboratory have made especially important contributions to understanding the molecular mechanisms of isoflavones, recently applying gene arrays and proteomics to this field. Mr. Shurtleff is not well known to the scientific community but he is often credited with bringing tofu to America through his book, The Book of Tofu (1), which was published in 1975. However, it is the vast database that includes >70,000 references to the use of soy foods dating back to 2000 BC that is arguably his major contribution (2). The contributions by Dr. Barnes and Mr. Shurtleff will carry on for generations.

LITERATURE CITED