

Second International Scientific Symposium on Tea and Human Health: An Introduction

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A first International Symposium on Tea in the United States was held in New York City on March 4, 1991 with the title "Physiological and Pharmacological Effects of *Camellia sinensis* (Tea)" (1). In the field of nutrition and health, the usual investigations dealt with foods that were consumed as solids by humans and animals. It was also felt important to determine the role of beverages. In fact, adequate fluid intake is essential for life. Clearly, water is the beverage consumed to the greatest extent and in any food, raw or cooked, is part of the nutritional spectrum. Worldwide, tea turns out to be the second most common beverage consumed by humans, ever since it was introduced as a beverage in China some 4000 years ago. Yet, except for a certain folklore and popular dogma, there have been few serious studies on any beneficial or adverse effects of tea. Such research was conducted in the Orient and, in particular, in Japan and China, beginning about 1970, and these studies utilized green tea, the major beverage in the Orient. About 1985, Western scientists began research on tea and health, including studies in epidemiology to assess the role of tea in human health. Also, laboratory studies established essential information on the composition of tea, and various biochemical and physiological parameters associated with tea use. Furthermore, based on the knowledge from the composition of tea, the role of specific ingredients of tea under *in vitro* conditions was studied. The combined body of knowledge was presented at the Symposium in New York and also at several other meetings held elsewhere about the same time. In the intervening years, a number of conferences were held specifically dedicated to tea, or as sections of other scientific events of a more general nature, such as those organized by chemical societies in the United States and Japan, or those reporting on the effects of antioxidants, since one major component of tea with physi-

ological actions is in the form of polyphenols, that are powerful antioxidants.

Since the first Symposium, there has been increased interest in the field of tea and health in many parts of the world. It seemed timely and appropriate, therefore, to summarize the progress made and review current knowledge in this area. Thus, the organizers, under the auspices of the Tea Council of the United States, established an International Symposium Advisory Panel together with the American Health Foundation, the American Cancer Society, and The Nutrition Committee of the American Heart Association. We were fortunate to have senior staff of the U.S. Department of Agriculture (U.S.D.A.), specifically Dr. C. Woteki and Dr. B. Clevidence, interested in hosting this symposium in Washington D.C. in the Thomas Jefferson Auditorium of the U.S.D.A. headquarters facilities. The overall management of the organization of the Symposium was greatly facilitated by Aronow & Pollock Communications, Inc., working with the Tea Council of the United States and this writer.

The program included presentations by Dr. Clevidence on research at the U.S.D.A. Human Nutrition Program, including a newly developed program on research on tea. In addition, there were appropriate comments by Dr. D. Ringer, of the American Cancer Society of that major organization's role in research on nutrition and cancer, and by Dr. Barbara Howard on the appreciable interest of the American Heart Association in the field of nutrition and health.

The Symposium documented clearly that the earlier assumption regarding the health benefits of tea were actually correct. Indeed, epidemiological approaches showed that traditional tea drinkers had a lower risk of heart disease. But in contrast to research in the field of tea and cancer, where there are exacting and reliable animal models for various types of cancer, this was not true for the field of research on heart disease. Yet, data show that the powerful antioxidants in tea may decrease the oxidative processes associated with the formation and occurrence of arteriosclerotic plaques in the vascular system and the heart. Epidemiological approaches also confirmed a lower risk of cancer of the stomach and the esophagus in China in regular users

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of green tea as is customary there. Epidemiological studies on regular users of black tea have so far not revealed a reduced risk of cancer prevalent in the Western world. Clearly, further efforts are needed in sorting out nutritional habits associated with the risk of the diet-related cancers, as modulated by regular tea use. The bulk of knowledge presented at the Symposium dealt with the mechanisms of action of tea as a source of antioxidants that were studied in several reliable models. Also, tea was shown to exert a potent preventive action for cancer of the oral cavity, esophagus, stomach, colon, lung, and skin in rodents, specifically in mice and rats. The underlying mechanisms dealt with modification of carcinogen metabolism, increasing detoxification, with a lower rate of cell duplication, decreasing not only the development and growth of cancer cells, but importantly, reducing the growth of early cancer types such as those on skin and breast. Eventually, these remarkable new findings may be extended to decreased risk of cancer in humans, not only in primary cancer prevention, but as an adjuvant therapeutic modality.

A number of reports provided key knowledge on the absorption of the active ingredients in tea, and, in particular, the tea polyphenols. It was important to establish this point, since the chemical structure of the tea polyphenols, described at the First Symposium, consisted of complex ring systems. Migration through the intestinal tract of such

chemicals might lead to their elimination without absorption. Therefore, detailed review of the analytical methods and results obtained relative to this area were important. It showed clearly that the tea polyphenols were absorbed.

The overall base of knowledge in the field of nutrition and health is now broadened by information not only on what people eat but what they might consume as a beverage. Black and green tea have similar beneficial attributes in lowering the risk of heart disease and many kinds of cancer. There is an important body of knowledge on the mode of action of tea ingredients in accomplishing these effects. The current Symposium in the United States, together with reviews elsewhere in the world, have provided adequate knowledge for public health promotion. It is also the springboard for further detailed research to strengthen the existing data and provide new approaches to healthy people worldwide. Preliminary results suggest that tea modifies the intestinal bacterial flora toward a beneficial type, may have antiviral actions, and may contribute to increased longevity. One statement applicable to research on tea is that "people should die healthy as late as possible."

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1. First International Symposium on Tea and Health, Proceedings of the First International Symposium on Tea and Health. *Prev Med* 21:329-391, 503-553, 1992.