International Activities and Recent Research Topics of the Japanese Society of Nutrition and Food Science

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International Activities

The Japanese Society of Nutrition and Food Science (JSNFS) was established in 1947. An overview of the organization can be found at http://www.jsnfs.or.jp/english/. The society has long placed a high value on international activities, many of which have been performed in cooperation with international bodies representing related fields, including the International Union of Nutritional Science (IUNS), the International Union of Food and Technologies (IUFoST), and the Federation of Asian Nutrition Societies (FANS). The Committee of International Affairs of the JSNFS plays an active role in interactions with organizations and researchers abroad. The current focus of its activities is on the expansion of collaborative ties with Asian countries.

Asian Congress of Nutrition

Presently, FANS consists of societies representing 17 countries and regions. Since the establishment of FANS in 1973, JSNFS has vigorously contributed to its activities. One milestone accomplishment was the organization of the 5th Asian Congress of Nutrition (ACN) held in Osaka in 1987. The ACN is a quadrennial assembly of FANS members that is intended to encourage scientific interchange between food and nutrition researchers. During the last decade, the possibility of hosting another ACN was discussed in our society, and ultimately a bid was made to host the 12th ACN in 2015. After intensive preparation, we won the vote at the general FANS meeting held last year to host the Congress. JSNFS has already formed the organizing committee for the 12th ACN with Professor Teruo Miyazawa (Tohoku University) being the chair. The Congress is scheduled for mid-May of 2015 at Pacifico Yokohama. Several thousand participants are expected to attend. The theme of the Congress proposed by the committee is "Nutrition and Food for Longevity: For the Well-Being of All."

IUNS Workshop

Another recent achievement of the JSNFS was the co-hosting of the IUNS Workshop on Capacity and Leadership Development in Nutritional Sciences, which was held in September of 2010. Four organizations jointly hosted the workshop: the IUNS Committee of the Science Council of Japan, The Japanese Society of Nutrition and Dietetics, the National Institute of Health and Nutrition of Japan, and JSNFS. Thirty-six young researchers (15 from abroad and 21 from Japan) were selected to participate in group work to discuss specific topics and field trips with coordinators, faculty members, and observers. JSNFS took charge of one group work, the topic of which was functional food. The success of the workshop will surely fortify the international network of researchers in food and nutrition science, especially for the leaders of the next generation.

Cooperation with societies in nearby countries

To further promote joint initiatives for improved understanding and cooperation with societies in nearby countries, JSNFS has been working

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to set up agreements of mutual exchange. In the past several years, the JSNFS has adopted memoranda of understanding (MOU) with two societies: The Korean Society of Food Science and Nutrition and the Nutrition Society of Taiwan. Possible areas of co-operation include exchange visits of speakers at society conferences, the exchange of society information and publicity, joint meetings, international co-studies, scientist exchanges, joint funding opportunities and improved research collaboration and publications. MOUs with other Asian societies are currently under consideration.*2

Recent Research Topics

Functional food

The science of food and nutrition has witnessed a dramatic change in its fundamental role. The major public concern related to nutrition has shifted from deficiency to over-nutrition during the last half century, although the problem of nutritional deficiency is still a huge burden, especially in developing countries. Thus, mainly in developed countries, the increase in obesity and lifestyle-related diseases has become a major issue. The mission of JSNFS, therefore, is to contribute to human health through the promotion of research in the food and nutrition field. A landmark in food science in Japan was the proposal of the concept of "functional food."[1] In 1996 the Ministry of Health, Labour and Welfare launched a system of approving health claims displayed on food products if sufficient scientific evidence is provided. This function was later taken over by the Consumer Affairs Agency. To obtain approval as a Food for Specified Health Uses (FOSHU), the following must be provided: data showing the effectiveness of the food on the human body, the absence of safety issues, the use of nutritionally appropriate ingredients, and so forth. Researchers including JSFNS members have been involved in providing scientific evidence for the functionality of FOSHU products.

Food safety

In Japan, incidents that have threatened consumers' trust in foods have been reported one after another over the past decade or so. They include the outbreaks of BSE and avian flu, cases of misconduct by Japanese food manufacturers, residual pesticides in foods and the poisoning of imported foods, and controversies regarding genetically modified foods. These incidents and phenomena have led to the rapid growth of public concern regarding food safety. Accordingly, the demand for research relevant to food safety has increased.

Food education or "*Shokuiku*"

Another trend related to food and nutrition is the diversification of eating habits, which has various negative aspects. Problems associated with this trend include children eating alone, skipping breakfast, eating late at night, the inclination to eat energy-dense, nutrient-poor foods purchased at convenience stores and fast food restaurants, and the excessive desire of young women to be slim. Therefore, food education, or "*shokuiku*" in Japanese (*shoku* for food and *iku* for education), has become more important. One of the aims of the JSNFS is to convey accurate information about nutrition and food, an activity that will contribute much to *shokuiku*.

Dietary Reference Intakes

Information derived from the research activities of society members helps in the setting of appropriate levels of energy and nutrient intake (Dietary Reference Intakes). The DRI for Japanese individuals is revised every five years. However, evidence for the establishment of definitive values is usually difficult to obtain, especially for values appropriate for specific stages of life. Thus, further data obtained from human studies are needed for research on nutrient requirements for the elderly, for pregnant and gestating women, and for infants.

Nutrition and Epigenetics

Recent epidemiological and animal studies have revealed that over- and under-nutrition during specific stages of life could have unexpected effects. For example, small size at birth results in higher risks of obesity, Type 2 diabetes, hypertension, stroke and osteoporosis in later life. The hypothesis that could explain these phenomena, which is referred to as the developmental origin of health and diseases (DOHaD), is that unbalanced nutrition *in utero* causes modifications of

*2 In 2011, after the preparation of this manuscript, JSNFS adopted MOU with Chinese Nutrition Society.

genome DNA (epigenetic alteration) without changing its sequence, and these modifications predispose the individual to the above diseases.

Nutrigenomics

The emergence of molecular biology during the last several decades has enhanced nutrition and food science in terms of both concepts and technology, leading to the prosperous development of the field of molecular nutrition. The mechanisms underlying nutritional deficiency, the action of functional food components, the recognition of tastes and orders, and obesity and life style-related diseases, just to name a few, can now be explained to some extent by the contexts of gene expression and molecular modifications. However, considering the complexity of the structure, function, and regulation of the human body, much more research is required to attain comprehensive insights into the interactions between the food and the human body. It is believed that recent technological innovation that has enabled simultaneous and exhaustive analyses of the amount or situation of large sets of molecules—proteins, metabolites, gene expression levels, etc.—will help accelerate our understanding of such interactions. This line of research is referred to as nutrigenomics (nutritional genomics), since it was the elucidation of genetic information that made this innovation possible.

Conclusion

As mentioned above, the increase in lifestyle-related diseases is a serious problem. For instance, in Japan, the combined number of people with diabetes and in the pre-diabetic stage has risen to 22 million, which means that one-sixth of the population of Japan may require treatment or preventive measures. The continuous effort of JSNFS members has been and will continue to be essential to the reduction of such diseases, which in turn will lead to the improvement of our QOL and the curbing of the expansion of national medical expenditures.

Reference

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