Functional Food Science in Japan: Present State and Perspectives

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Japan has a long history of nutritional and food science. In 1911, our outstanding biochemist Dr. Umetaro Suzuki found an anti beri-beri principle from rice bran, which was then recognized as the world-first vitamin. A great deal of industrial applications resulted, but, for this, basic insights were indispensable, he said.

In 1984, Tokyo and Kyoto groups started basic food science and proposed the concept and terminology of “functional food”, with a resurgence of an old Chinese saying, “Medicine and food are isogenic”. Since then, food was considered as supplying us with more than nutrients. The current trend of considering foods as a first line of body defense against lifestyle-related diseases or metabolic syndromes has been growing with our increased understanding of functional food-aided health promotion.

For enhancement of public acceptance of such new foods, it is extremely important to appraise their effectiveness or efficacy by scientific evidence. One of the most helpful ways of the appraisal would be the use of comprehensive genomics. It can provide information about not only statistical correlationship between a functional factor and its effect but also their cause-result relationship which is more important in appraising a functional food quality.

In 2003, a number of food companies belonging to ILSI Japan endowed a laboratory to the University of Tokyo, the name being “Functional Food Genomics”. Associate Professor Dr. Shinji Okada is in charge and the activities are in good progress. Shortly after, the KAST Antiaging Project started to work on functional food genomics. These two have presented a great deal of outcomes with respect to DNA microarray data on antioxidation and others in peripheral systems.

Meanwhile, a new national project launched in 2014, which targets the center (brain). It is entitled “Ground Design of Cognitive Functional Foods for the Next Generation”. The cognition of food signals transmitted from oral cavity, digestive system, liver and other physiologically important organs is fundamentally important for functional foods. This effect of any function food would contribute to improving the quality of life (QOL) of the highly aged individuals increasing in Japan. The importance of conducting basic studies on new functional foods for high level applications is emphasized, as suggested by Dr. U. Suzuki more than 100 y ago.