Ⅸ Environmental Consideration to Products

1. Use of Non-GMO (Genetically Modified Organism) Materials

<Refer "Use of Non-GMO (Genetically Modified Organism) Materials," Corporate Citizenship Report 2006>

Genetically modified (GMO) produce were introduced to Japan in November 1996, and have awakened controversies about their safety and environmental influence. As soon as GMO soybeans began to be imported to Japan, Kikkoman became concerned about the question of GMO produce, as the soybeans used for its products were to be imported from the United States where GMO soybeans were produced.

The Ministry of Agriculture, Forestry and Fisheries published the "standards for indicating the use of GMO produce on product labels" in March 2000, and the labeling of their use on each product was enforced in April 2001. This duty was not applied to soy sauce for the reason that soybean protein and DNA were assumed to be decomposed in the long brewing process. Even so, the Soy Sauce Industry decided to formulate the guidelines for labeling the use of GMO materials on the precondition that it would be left with each company to do so. In the meanwhile, Kikkoman has prepared conditions for implementing voluntary labeling.

Even though soy sauce was exempted from labeling, it was the desires of consumers that prompted soy sauce manufacturers to declare the use of non-GMO produce. The five major companies out of 1500 soy sauce manufacturers in the country have up to a 50-percent market share altogether and the rest is shared by medium and small size manufacturers. A move to use non-GMO materials was initiated by these medium and small size manufacturers. Soon, requests for non-GMO materials were made from many interested parties, particularly from people working on school lunch, coop and major food processing companies.

Kikkoman began addressing this issue earnestly. In June 2003, Kikkoman declared that the company would switch all the soybeans for soy sauce to non-GMO soybeans in Japan. Today, the users of soy sauce for business and food processing purposes are concerned about the use of non-GMO soybeans. Many business talks begin on the assumption that Kikkoman's products are using non-GMO soybeans. At present, the statement on the use of non-GMO materials is a requirement when submitting a document on material standards to these companies along with the information on allergens.

Currently, Kikkoman voluntarily conducts regular sampling inspections on marudaizu (soybeans) and defatted soybeans used to produce soy sauce to be sold in Japan, and confirms that they are non-GMO materials. Further, at production and distribution sites, an IP-handled method is adopted whereby non-GMO and GMO products are managed separately, which is certified with a document describing the details of management in order to prevent them from being mixed. As a result, the use of a non-GMO material is clearly expressed on the label of the soy sauce "Kikkoman Tokusen Marudaizu Shoyu," for example,

Ingredients: Soybean (non-genetically modified), wheat, salt.

● Label stating "non-genetically modified soy beans are used."

2. Residual Agricultural Chemical Inspection According to the Positive Listing System

<Refer "Screening for Residual Agricultural Chemicals," Corporate Citizenship Report 2006>

Kikkoman received the "Technical Award for FY2006" by the Japan Soy Sauce Technology Center for the development of a "simultaneous analysis method on residual agricultural chemicals in soy sauce production." The following is a research outline prepared by a person in charge of the development of the award winning method.

The Food Hygiene Law was revised in May 2003 and the decision was made that the Positive Listing System of Residual Agricultural Chemicals would be enforced in May 2006. Accordingly, the levels of residual agricultural chemicals were restricted for all food products, and the standard values or tentative standard values for 801 kinds of agricultural chemicals and other substances were designated. For other agricultural chemicals for which the standard levels were not set, a uniformly strict level was laid at 0.01 ppm. Considering the implications of residual agriculture chemicals as a food processing company, we began developing a method to analyze agricultural chemical residues as a means to offer safe products.

The basic policies to develop a method to analyze different agricultural chemicals at one time were to satisfy the needs for: (1) stable qualitative analyses of agricultural chemicals, (2) accurate quantitative analyses, (3) qualitative analysis at a sensitivity level of 0.01 ppm, and (4) prompt and simple handling.

To realize these policies, we developed a preparation method using solid phase extraction to refine sample extract liquid, as this method allowed speedy and simple handling with a wide range of application. As a measuring device, we, first, studied the use of GC/MS recommended by the Ministry of Health, Labor and Welfare. But it was found difficult to attain highly accurate analyses with this device as its measurement was greatly affected by miscellaneous matters in samples. Then we tested a quadruple-type GC/MS/MS, which proved to have excellent qualitative and quantitative analyzing capabilities, and is hardly affected by miscellaneous matters. Using this device, we established a method to analyze 97 kinds of residual agricultural chemicals in raw materials (soybeans and wheat), as well as those remaining in soy sauce and byproducts simultaneously with accuracy up to 0.01 ppm density. [1-3)]

We inspected about 200 samples of ingredients and finished products, and detected no agricultural chemicals in them.

For the purpose of experiment, we added agricultural chemical mixtures in matured soy sauce moromi (unrefined soy sauce), compressed the samples, and examined the kinds, and quantities of agricultural chemicals distributed in the soy sauce liquid, soy sauce oil and soy sauce cake. The result showed that the greatest number of types of agricultural chemicals remained in soy sauce cake. [3)]

To respond to the enforcement of the Positive Listing System, we studied and developed the simultaneous analysis method of residual agricultural chemicals in soy sauce production with excellent performance in accuracy, speed, and cost. We presented the results at the Convention of the Japan Soy Sauce Technology Center, and published an article in its magazine "Study and Technologies on Soy Sauce." We will further continue this study, upgrade our analyzing technologies, and disseminate scientifically evidenced information on the safety assurance of food, thereby contributing to the development of the soy sauce industry.

References

1) Tatsuya Sakakibara, Takashi Ishiyama, Noriko Kimura, and Masaoki Sasaki, Summary of Lecturers 4 at the 62nd Research and Study Convention by the Japan Soy Sauce Information Center (2005)
2) Tatsuya Sakakibara, Takashi Ishiyama, Noriko Kimura, Hiroki Tatsumi and Masaoki Sasaki, Study and Technologies of Soy Sauce 32(2), 93 (2006)
3) Tatsuya Sakakibara, Noriko Kimura, Tatsuo Horiuchi , Hiroki Tatsumi and Masaoki Sasaki, Summary of Lecturers 4 at the 63rd Research and Study Convention by the Japan Soy Sauce Information Center (2006)