Genetically Modified Plants and the Public

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Summary

After the 1:' experiments on gene manipulation in the mid-1970s, genetic modification technologies have developed rapidly and nowadays various types of genetically modified organisms (GMOs) including animals and plants are directly or indirectly utilized in our daily life. However, the rapid development of the technology has created large gaps between scientists and the public in knowledge and acceptance of the utilization of GMOs, and many consumers feel apprehension about the application of GMOs, especially in GM foods. For the appropriate utilization of GMOs, the dissemination of proper biological knowledge about genes and GMOs to the public and communication between scientists and the public is important.

There are many guidelines, laws and international conventions on GMOs, which has made the situation complicated to scientists and also created misunderstandings in the public. As an example, take the Convention of Biological Diversity (CBD). The main purpose is the conservation and sustainable utilization of biological diversity including genetic diversity, but many peoples don't know that the convention contains a political and economic side. Scientists and administrative officials need to make much greater efforts to obtain exact information on guidelines, laws and international conventions, and distribute this to the pubic.

On the environmental effects of GM plants, various discussions are needed: what is nature (including biological diversity) that needs to be conserved, what is the purpose of agriculture, how should agriculture be done (agriculture itself has a large effect on nature), and so On. Moreover, it is critical that scientists establish estimation and comparison methods of biological and genetic diversity for assessment of environmental effects.

There are some misunderstandings about safety assessment of GM foods/food additives by consumers. Consumers don't know that the majority of cheese on the market is a GM food. Chymosin (a kind of protease) is indispensable for cheese production, and most chymosin is produced using genetically modified microorganisms (expression of the cattle chymosin gene in microorganisms and production of the protein). Safety assessment of GM foods/food additives is mandatory on the basis of internationally developed concepts, procedures and criteria that were agreed to by the CODEX Ad Hoc Intergovernmental Task Force on Foods Derived from

Biotechnology. Consumers need to know and understand that the conventional (non-GM) foods including organic foods have some risks for health.

Consumers have focused attention on labeling of GM foods. The purpose of the labeling is to maintain the right of consumers to know what they buy, but does not deal with the health issues. However, after the practice of labeling GM foods, many consumers began to feel that GM foods were not safe because they were labeled. This is a big impediment to accurate risk communication on GM foods. It is important to give the right information to the public. Moreover, to determine the appropriateness of labeling as well as proper international trade of GM products it is important to establish adequate methods for qualitative and/or quantitative detection of GM foods and standardize these internationally.

For the appropriate utilization of GMOs in our daily life, gene literacy education is very important. After the modification of the regulation (guideline) on recombinant gene experiments in Japan in 2002, genetic transformation experiments using safe bacteria and safe genes became available to practice on in high school. Currently, a lot of high school students in Japan have experience with genetic transformation experiments and have gained a better understanding of genes, genetic modifications and GMOS. The editor believes that more efforts in gene literacy education will stimulate the appropriate utilization of GMOs by the public.

This review summarizes the current situation of GM plants and GM foods focusing on their regulation in Japan. The editor hopes that this issue will contribute to the distribution of correct knowledge concerning gene manipulation technologies including GM plants and GM foods by the public.