DETECTION OF GENETICALLY MODIFIED ORGANISMS IN FOOD PRODUCTS

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Abstract : This article shows that food safety, nutrition and food security are closely related and cause dangerous food-borne diseases and malnutrition.

Key words : GMO, GMO analysis type A

Introduction: In addition to contributing to food and nutrition security, a safe food supply contributes to sustainable development by supporting the national economy, trade and tourism. Globalization of food trade, increasing world population, climate change and rapidly changing food systems affect food security.

Today, genetic technologies that change the genetic structure of living organisms such as plants, animals and microorganisms are often used in the food industry . In these studies, genes from different organisms are combined and this method is known as recombinant DNA technology.

An organism created by methods of genetic improvement is called a "genetically modified organism" or a "transgenic organism". Today, the leading genetically modified organisms are herbicide- and pesticide-resistant corn, soybeans, cotton, and canola.

But like all new technologies, genetically modified organisms have known and unknown risks. Although this topic is controversial among scientists , according to the general opinion, they are not harmful to human health. However, no detailed tests have been conducted on the long-term effects of such foods.

Although modern genetic engineering is very advanced and certainly useful, it also raises questions related to food safety. Because there is an unexpected intervention in the natural world of plants, and its consequences are not fully known.

In addition to all this, there have been no health problems since genetically modified food was introduced to consumers. Although this is not to say that it never happened, a reaction as strong as the opposition's resistance has yet to be determined with certainty.

A narrower definition by the Food and Agriculture Organization of the United Nations, the World Health Organization and the European Commission states that organisms must be modified in a way that "does not occur naturally as a result of mating and/or natural recombination." There are examples of crops that fit this definition but are not generally considered GMOs. For example, the cereal triticale was completely developed in the laboratory in the 1930s, using various methods to modify its genome. The Cartagena Protocol on Biosafety used a synonym for living modified organism in 2000, defining it as "any living organism that has a new combination of genetic material obtained by modern biotechnology."

When describing the genomes of organisms that have been directly manipulated by biotechnology, genetically engineered organism (GEO) can be considered a more accurate term than GMO. The term GMO was originally used by scientists to describe genetically engineered organisms until the use of GMOs became widespread in the media. Not used for United States Department of Agriculture (USDA) GMOs are considered to be plants or animals that have been genetically engineered or inherited by conventional methods, while GEO refers

to genes that have been introduced, deleted, or rearranged using molecular biology. refers to organisms with specific recombinant DNA techniques such as transgenesis

The definitions focus on the process rather than the product, meaning that GMOs and non-GMOs with very similar genotypes and phenotypes can be GMOs. This led scientists to call it a category that has no scientific meaning, saying that it is impossible to combine different types of GMOs under one general definition. It has also created problems for organic organizations and groups that want to ban GMOs. It also creates problems as new processes evolve. The current definitions came before genome editing became popular, and there is some confusion as to whether they are GMOs or not. The EU ordered them to change the definition of GMOs to "organisms obtained by mutagenesis".

Currently, genetically modified organisms are widely used in basic and applied scientific research. Development patterns of certain diseases using genetically modified organisms (Alzheimer disease , cancer), aging and renewal processes are being studied, the activity of the nervous system is being studied, and a number of other urgent problems of biology and modern medicine are being solved.

Genetically modified organisms have been used in practical medicine since 1982. This year, genetically engineered insulin obtained using genetically modified bacteria was registered as a drug. Currently, the pharmaceutical industry produces many drugs based on human recombinant proteins: such proteins are produced by genetically modified microorganisms or genetically modified animal cell lines. In this case, genetic modification is the insertion of a human protein gene into the cell (for example, insulin gene, interferon gene, beta-follitropin gene). This technology makes it possible to isolate proteins from GM organisms rather than from donor blood, which reduces the risk of drug contamination and increases the purity of isolated proteins. Work is underway to create genetically modified plants that produce components of vaccines and drugs against dangerous infections, cholera, HIV. Proinsulin derived from genetically modified safflower is in clinical trials. An antithrombotic drug based on transgenic goat milk protein has been successfully tested and approved for use

A new field of medicine - gene therapy - is developing rapidly. It is based on the principles used to create GMOs, but the human somatic cell genome acts as the object of modification . Currently, gene therapy is one of the main methods of treating some diseases. Thus, in 1999, one in four children with SCID was treated with gene therapy In addition to its therapeutic uses , gene therapy has also been proposed to slow the aging process.

Conclusion: Almost 90% of scientists believe that genetically modified organisms are safe and pose no threat to food safety. However, a third of consumers agree with this opinion. So I leave it to you to draw conclusions.

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