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Adverse Effects of Genetically Modified Products on Human Health (Review Article)

Korjavov Sherali Oblakulovich, Ismoilov Ortik Ismoilovich, Shermamedova Kokhira Tekhronovna
Department of Human Anatomy, Samarkand State Medical University

Abstract: Most of the food consumed is either completely genetically modified food, or a type of food that includes food components produced using genetic modification technology. Among the doubts about GMOs that are widely used and consumed around the world, the most pressing issue is the likely health risks caused by eating GMOs. As uncertainty about GM products persists, studies conducted in many countries have shown that there are many differences in gene transfer. some features that cause allergies and diseases can be transmitted from another organism, and as a result, there may be a risk of detecting unexpected biochemical products in transgenic products. information, attitudes and behavior of people to this issue in different countries.

Keywords: genetically modified foods, human health, negative effects.

Relevance. The advantages of modified plant varieties are obvious - they are resistant to diseases, droughts, herbicides, pests, viruses, frost-resistant, give a good harvest, which can be preserved for a long time and without loss. Some species of modified plants may be immune to chemicals that, at the same time, may be deadly to other plants. As a result, the field is freed from all weeds, and crops resistant to herbicides survive. There are both supporters and ardent opponents of GMOs. And everyone offers their own arguments in defense of their own theory. Defenders of transgenic organisms silence the influence of GMOs on humans and animals, but proclaim these products as a unique salvation of all mankind from hunger. After all, the world's population continues to increase, and the available resources are no longer able to cover the ever-increasing food needs of people. Therefore, in order to maintain your health, it is desirable to minimize the use of genetically modified products. How to recognize a normal and genetically modified product. After all, the marking is actually not always present? Primarily in appearance. Unnaturally correct shape, like plastic vegetables and fruits, all soybean products, all kinds of chips, cereals, rings, snickers, pepsi cola, and all this western "consumer goods" should cause alertness in the first place. In addition, there are even entire lists of food enterprises that have completely abandoned the production of genetically modified products.

Purpose: To determine the degree of knowledge of the likely consequences of using genetically modified products.

Research materials and methods. Biotechnology, developing at an incomprehensible pace, is not only a research area, but it also enters our lives in many areas, from health to nutrition and from our products to pets. The genetically modified organism (GMO), which is the most published biotechnology product and has been one of the most popular discussions in recent

years, continues to be a pressing issue in the modern world. Any organism that is created by altering its genetic, material characteristics or adding any new properties through biotechnological methods is called a genetically modified organism (GMO).

Today, both pros and cons or risks to the health of GMOs have begun to be discussed [14]. Since there is no definite information on the results of the use of these products, this situation leads to some questions and discussions focused on humans, animals, the environment and biological diversity. It is certain that the most serious problem associated with GMOs is the impact of these products on human health [12]. Food, which is closely related to human health and is the most important factor in terms of adequate and balanced nutrition of the world's population, must be of high quality, abundant, cheap and healthy [3].

Modern technologies show that we can directly change genetic material through deliberate intervention and that between different species we can get hybrids that are not in nature [2]. This allows genes to be transferred between different species of creatures from different worlds that cannot be mixed in nature. The fish gene of tomato and the human gene of sheep, pig or Escherichia coli bacteria, which live in the intestines of all mammals, can be transferred [11].

Currently, most of the consumed food products are either genetically modified food products or food products that include food components produced using gene modification technology [8].

Genetically modified foods are completely identical to their natural samples in their basic basic characteristics, such as color, smell and appearance. Around the world, many different products have been regenerated by genetic modification and have received a patent for use as human and animal feed from health institutes in many countries. Corn, soybeans, tomatoes, potatoes, rice, wheat are the leading agricultural products derived from GM species. The most popular products are soybeans, cotton, corn and rape, and among them this process is applied mainly to soybeans [20].

In addition to these products, rice, pumpkin, sunflower, peanuts, cassava and papaya are also grown as GM. Studies on banana, raspberry, strawberry, cherry, pineapple, pepper, melon and watermelon are still ongoing. Among cereal crops, only rice is transmitted by the herbicide resistance gene. There was no transgenic product for crops such as wheat or barley that had a high economic value [6]. Genetic modification studies are also conducted in animals. With regard to animals, studies are aimed in particular at increasing resistance to diseases, controlling their growth or changing the quality of wool and milk components.

As a result of these studies, fish became the only animal produced economically [16]. In addition to plant and animal products, GMO technology is also used for microorganisms. Genetically modified microorganisms (bacteria, fungi and mold) are used as enzymes and food additives in various industries such as bread, beer, cheese, grape products, etc., to produce amino acids [21]. In the fermented meat, dairy and other food industries, lactic acid bacteria are commonly used as a starter to ferment foods such as cheese, yogurt, kefir, sausage, etc. These cultures give the food a specific taste and smell, ensuring the maturation of fermented food [1, 18].

In a report published in 2005, the World Health Organization (WHO) stated that GMOs have potential risks to human health and growth and have no history of consumption as a safe food, and that replacement of a new gene in the genome of a modified food may cause undesirable developmental and physiological effects [4]. Despite all its advantages, transgenic products have certain risks. Because these products have genes that are not found in foods native to nature, they raise serious doubts. Foreign genes can cause unpredictable changes both by increasing the nutritional value of some foods and by reducing the value of some other foods [21,24].

Plant products by genetic modification can form unexpected mutations, and these mutations can lead to the emergence of new high-level toxins in food [13]. There have also been many findings from studies showing that toxic materials in transgenic plant residues penetrate soil and water. Endotoxins produced by some genes have been observed to remain in the soil for 33 weeks. Therefore, toxins are likely to join the food chain of other organisms [19,23]. GMOs have insect killer genes that are transmitted via terminator technology. Since toxic material is constantly produced in plants with these genes, they are called "pesticide-producing plants" [15].

Some researchers claim that GMOs may have a carcinogenic effect directly or indirectly [9]. Hormones and hormone-like substances negatively affect human health [17]. Although uncertainty regarding GM products persists, studies have shown that there are many differences in information, attitudes and behavior of people towards this problem in different countries [7].

In a study by Christopher et al. (2008) 40% of consumers nationwide said they would not use GMOs even if they were good for health and the environment. Also, consumers in England, France, Spain and Italy said they would not use GMO products. In a study conducted abroad, consumer attitudes towards GMOs were observed to be "positive" in the US and "negative" in other countries.

Contrary to the results obtained in Turkey and other countries, almost half of the US population supports agricultural biotechnology, considers genetically modified products "improved," and also taking into account the benefits of these products, they believe that the widespread use of these products can reduce the use of pesticides. and improve nutritional quality [5, 10].

Conclusions. Among the doubts regarding the globally widely used and consumed GMOs, the most pressing is the question of the likely health risks caused by eating GMOs. While genetically modified foods continue to emerge, debate about their impact on the environment and health has become an increasing problem. As a rule, experts on this issue support the continuation of research, but consumers react against them because they do not have enough knowledge. In this regard, GM products should be released to the market after sufficient scientific research has been carried out and should be checked within the framework of legislation, and consumers should be informed about the problem.

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