

Current Issues of Food Security in Russia

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Abstract—Relevance of the research topic is determined by the expediency of strengthening food security and providing the population with safe food products. One of the important analyzed aspects was the study of non-target mutation applied methods' safety in the use of genetic engineering in the food production. The theoretical basis of the research is the scientific research results of domestic and foreign scientists in the field of food quality and safety. According to the authors, the lack of a unified information system of traceability at all stages of the food life cycle within the EAEU has a negative impact on its quality and safety. The solution to the problem will be to ensure the stability of domestic production, the availability of necessary reserves and food supplies that meet the requirements of standards. It is also advisable to apply effective technical regulation in terms of tightening the control of dual-use objects, including GMOs, by making appropriate changes to regulatory legal documents.

Keywords—*economy; food security; rational nutrition; doctrine; rejections; traceability; GMOs*

I. INTRODUCTION

Issues of food security, of course, for most countries of the world continue to be fundamentally important and multilateral. This explains the relevance of the research topic. The global goal achievement of enhancing food security is strategically important and requires a focus on individual countries, drawing on national or regional experience. The implementation of food security mechanisms in each country takes place at different administrative levels and using different methods and tools.

However, there are common problems for all countries. One of them, according to the authors, is the use of potentially dangerous technologies of genetic engineering modification in the food production. For Russia, ensuring the safety of products entering the market is also one of the most important directions of the state economic policy.

II. REVIEW OF LITERATURE AND LEGAL ACTS IN TERMS OF PROVIDING THE POPULATION WITH SAFE FOOD PRODUCTS

In order to form the state economic policy in the field of providing the population with safe food products, the Decree of the President of the Russian Federation dated 30.01.2010 No. 120 was prepared, which approved the "Doctrine of Food Security of the Russian Federation" (hereinafter the Doctrine) [1].

The main provisions of the Doctrine are aimed at the development of the national security Strategy of the Russian Federation until 2020, approved by the decree of the President of the Russian Federation on May 12, 2009 [2].

The adoption of the national security Strategy is based on the results of scientific studies proving that the lack of a balanced diet leads to the development of non-communicable diseases such as cardiovascular disease, diabetes, osteoporosis, obesity, oncology, which in turn are the causes of more than half of the population mortality of our state. At the same time, the causes of diseases associated with food status are almost 50% [3].

The data presented in the annual state reports of the Federal service for supervision of consumer rights protection and human welfare (Rospotrebnadzor) confirm the importance of optimal nutrition for the prevention of dangerous diseases and reduce mortality.

In this regard, the Doctrine defines the food security of the Russian Federation as one of the main national security directions, the strategic goal of which is to provide the population with safe agricultural products, fish and other products from aquatic biological resources and food. The achievement of the strategic goal can be ensured by the stability of domestic production, as well as the availability of necessary reserves and food supplies [4].

To provide the population of the country with safe food products, it is necessary to monitor compliance with the requirements of the legislation of the Russian Federation at all stages of their life cycle: production, storage,

transportation, processing and sale. At the same time, special attention should be paid to the safety of food products imported. The mass fraction of rejections from the checked

number of the main groups of goods arriving on import according to safety requirements is presented in “Fig. 1”.

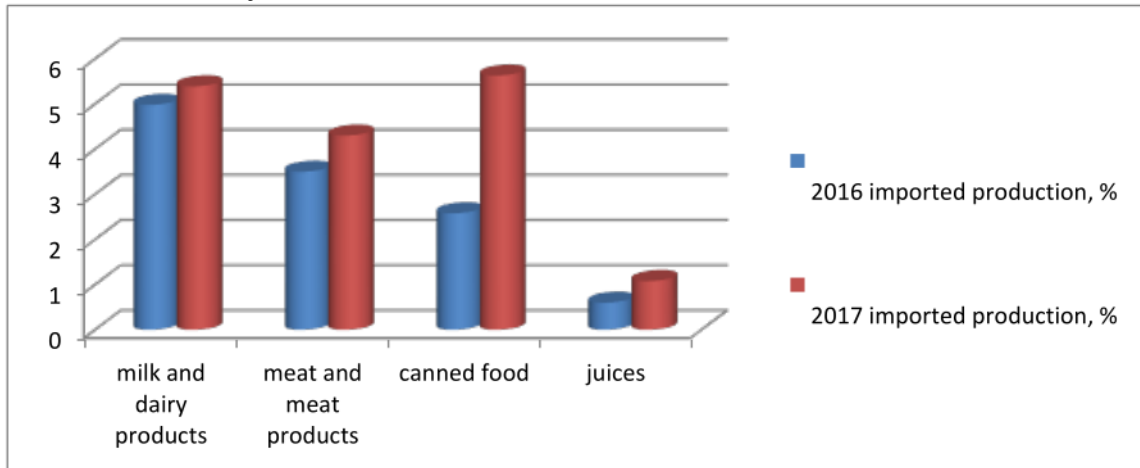


Fig. 1. Mass fraction of samples that did not meet the safety requirements (compiled by the authors on the basis of [1]).

From the data presented in “Fig. 1”, it follows that there has been an increase in rejections in terms of safety of the main groups of goods, including imported canned food and meat products by more than 5%.

The provisions of the Doctrine prohibit the uncontrolled distribution of food products derived from genetically modified plants using genetically modified microorganisms and microorganisms having genetically modified analogues (hereinafter GMOs).

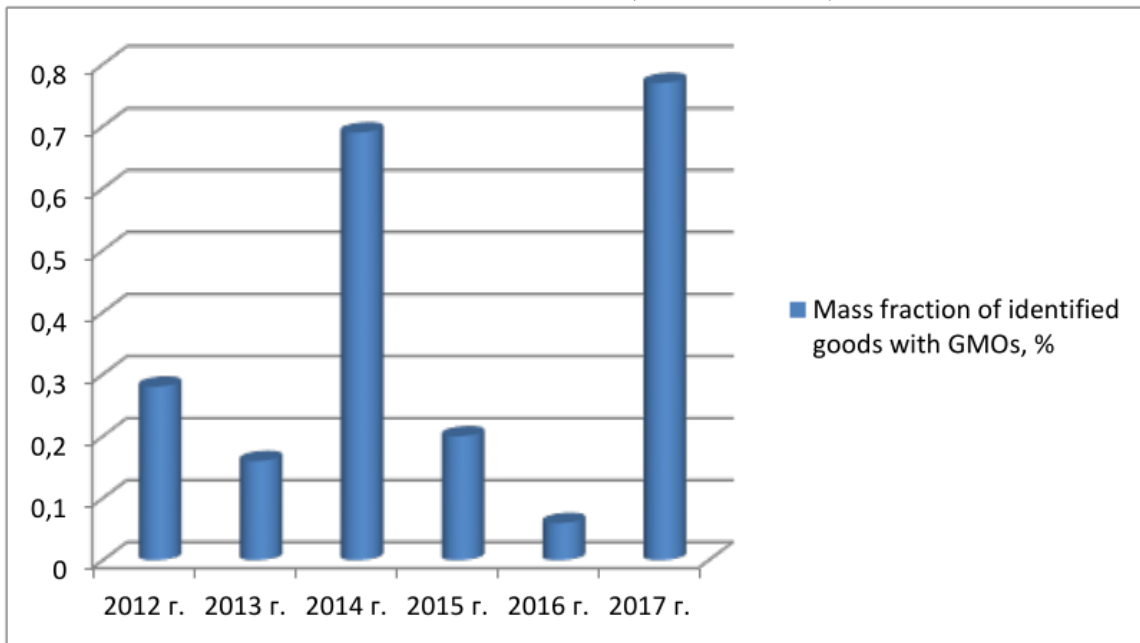


Fig. 2. Mass fraction of samples of imported products with the presence of GMOs (compiled by the authors on the basis of [1]).

The statistics shows that in 2017, was investigated 1 825 samples for the presence of GMOs, while seventeen of the identified samples with a GMO content of fourteen samples of goods received for import (see “Fig. 2” and “Fig. 3”). In

addition, quite often there are cases of lack of information for the consumer about the presence of GMOs (for example, on biologically active additives to food imported).

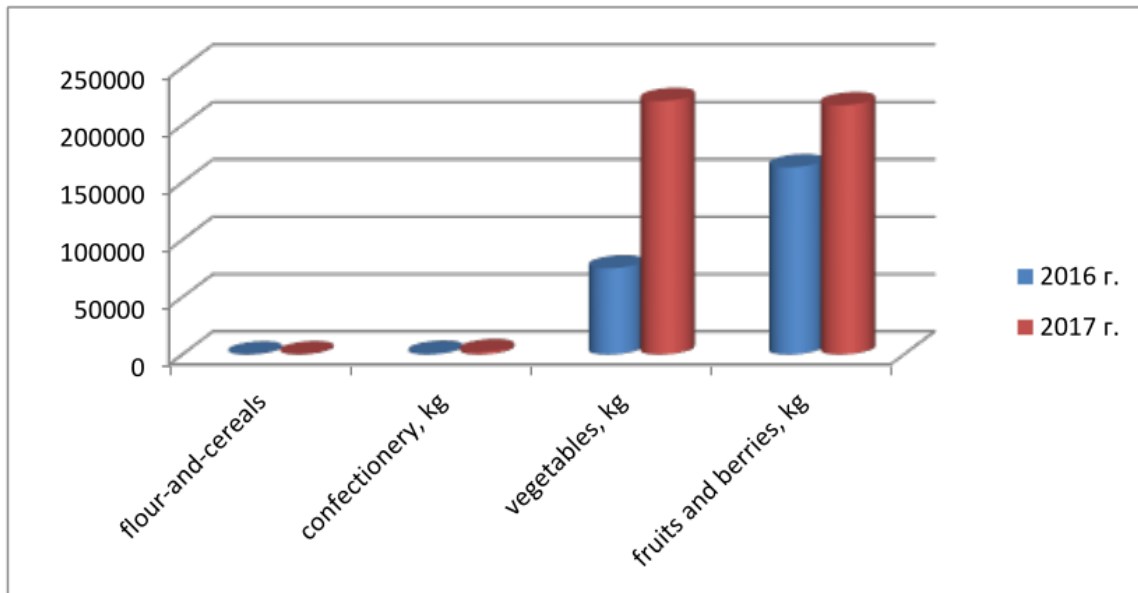


Fig. 3. The number of rejected genetically modified imported products (compiled by the authors on the basis of [1]).

According to the results of monitoring food product safety held in 2017 in the consumer market in the Russian Federation by the bodies of Rospotrebnadzor 64,385 quantities of goods were rejected, which amounts to 1,916,019.5 kg. The data shown in the diagrams show a tendency to increase import of hazardous imported food products, including the presence of GMOs.

In order to improve state regulation in the field of genetic engineering, Rospotrebnadzor has prepared proposals for amendments to certain legislative acts of the Russian Federation aimed at the implementation of Federal law No. 358-FZ of July 3, 2016.

III. METHOD OF RESEARCH

The theoretical basis of the research is the results of domestic and foreign scientists' scientific developments in the field of food quality and safety. The methodological basis of the study is the theory and methodology of a systematic approach to the analysis of quality control and food safety.

One of the important analyzed aspects in this work is the study of the safety of the applied methods of non-target mutations using genetic engineering.

IV. THE MAIN FACTORS OF FOOD SECURITY IN RUSSIA

To ensure the safety of the food market, Rospotrebnadzor has established a procedure for monitoring the circulation of genetically modified organisms, providing for the detection and suppression of violations that may result in the introduction of GMOs into the environment.

In accordance with the Federal law of July 3, 2016 №358-FZ "On amendments to certain legislative acts of the Russian Federation" the procedure has been established for monitoring the impact on humans and the environment of GMOs and products obtained with the use of such organisms or containing such organisms, and control over the spread of

such organisms into the environment. The monitoring procedure is to be carried out by authorized Federal Executive bodies in accordance with the procedure established by the Russian Government [5].

In accordance with the legislation, the Rospotrebnadzor bodies monitor the content of GMOs and the availability of information for consumers about the content of GMOs in food products within the framework of supervision after the state registration procedure.

In accordance with article 7 of the Federal law "On state regulation in the field of genetic engineering", the Government of the Russian Federation prepared a Resolution dated March 13, 2017. No. 281, which provides for the Procedure of the Federal service for supervision of consumer rights protection and human well-being to monitor the effects on humans and the environment of genetically modified organisms and products obtained with the use of such organisms or containing such organisms, and control the release of such organisms into the environment [6].

When monitoring the impact on humans and the environment of genetically modified organisms and genetically modified food products are used:

- data of state registration of genetically modified organisms and genetically modified food products;
- results of the food product researches which are carried out within implementation of Federal state sanitary and epidemiological supervision and Federal state supervision in the field of consumer protection;
- information of bodies and organizations of the member states of the Eurasian Economic Union (hereinafter EAEU), other states or international organizations on genetically modified organisms and genetically modified food products that pose a threat to human life and health;

- materials of scientific research on the impact on the human body of genetically modified organisms and genetically modified food products.

Based on the results of the monitoring, a decision is made to identify and suppress violations that may result in the introduction of GMOs into the environment.

Information on the results of the impact monitoring on humans and the environment of genetically modified organisms and genetically modified food products is transmitted to the Federal information fund of social and hygienic monitoring data.

In case of detection by results of negative impact monitoring on the person and environment of genetically modified organisms and genetically modified food products Rospotrebnadzor takes the following measures:

- the decision on cancellation of the issued certificate on state registration of the genetically modified organism or genetically modified food products or modification of it regarding establishment of special conditions of use of genetically modified food products is made;
- proposals are made to the Government of the Russian Federation to establish a ban on the import into the territory of the Russian Federation of genetically modified organisms and (or) genetically modified food products.

Rospotrebnadzor provides publication of monitoring results of impact on the person and environment and genetically modified food products and control of release of genetically modified organisms in environment on the official site in the information and telecommunication network "Internet" and in the state information resource in the field of protection of the consumer rights of, quality and safety of goods (works, services).

Due to the fact that Russia has the richest agricultural resources and natural conditions, the Government decided to use only organic farming methods and use natural products for domestic consumption and export.

This decision was reflected in the Federal law of 03.07.2016 No. 358-FZ, which provides: "Cultivation and breeding of plants and animals, are prohibited, the genetic program of which is changed using genetic engineering methods and which contain genetically engineered material, the introduction of which may not be the result of natural processes, except for the cultivation and breeding of such plants and animals during the examination and research works."

It should be noted that with a reasonable decision on a complete ban on the cultivation and breeding of plants and animals using genetic engineering, it is unreasonably allowed to import GMO products to the Russian market with the mandatory presence of the importer's certificate of product registration with modified genes, if they have not been introduced a separate special ban [7].

The above contradiction in the legislative acts indicates the need to revise the mechanism of GMO turnover regulation in Russia.

In connection with Russia's accession to the World Trade Organization, the regulatory legal framework in the field of food safety should be harmonized with the requirements of international standards. However, the above information confirms that the current regulatory framework does not contribute to the improvement of the mechanism for regulating the turnover of GMOs.

The lack of a unified information system for traceability of food quality and safety at all stages of the life cycle exacerbates the situation, making it possible to falsify vital information for the consumer, which includes information on the origin of goods, the use of GMOs, the use of drugs for veterinary use and plant protection products. There are contradictions in the requirements of different documents, which make it impossible to conduct an objective identification of goods [8].

In order to improve the efficiency and coordination of food safety control, it is advisable to develop interdepartmental regulations defining the procedure for cooperation between the Federal customs service (FCS of Russia), the Rosselkhoz nadzor and Rospotrebnadzor within the framework of their powers in the implementation of the corresponding types of state control over imported agricultural products, which is obtained with the use of unregistered GMOs in Russia [9].

However, one of the most important obstacles to improving the effectiveness of GMO control in the Russian market, according to the authors, is the lack of necessary research methods related to the development of an increasing volume of goods using GMO in the international community. New applied biotechnologies that are not registered with know-how cannot be identified by existing control methods and can lead to atypical epidemiological diseases if adversely affected.

The development of new methods of genetic engineering related to genome editing (CRISPR-Cas) in the last decade, which can be used to include, remove or move DNA fragments in the genome of the organism, aimed at certain mutations, is of concern. CRISPR-Cas methods are used in genetic engineering in many countries, including developments in Russia, which provides opportunities for the development of new biotechnological strategies [10].

Research on editing the genome with CRISPR-Cas is carried out in relation to the cells of any organism. For example, in 2017, this method was edited by the genome of human embryos [11].

The authors of the research hope that due to the huge potential of the developed methods in the future it will be possible to deal with the most terrible human diseases. However, one should not forget about the downside of these developments, as mutations can be used as a means of bioterrorism. Given the multidirectional effects of mutations, research in the field of genetic engineering should be accompanied by an analysis of the results from the point of

view of ethics and law by the authorized state bodies, which should fix and clarify aspects that affect the clinical implementation of genome editing technologies [12].

The main analyzed aspect of the research should be the safety of the methods used the study of non-target mutations, both in Russia and abroad. Scientific studies indicate that with such huge opportunities exist also the unknown risks to the health and wellbeing of the person and offer to start a lucid discussion of the use of technology genome engineering and determine the immediate steps to be taken to ensure the safe and ethical use of technology genome engineering [13].

Given the possibility of using genetic engineering techniques related to genome editing (CRISPR-Cas) for both medical and terrorist purposes, it is necessary to consider technologies and products derived from them, such as dual-use technologies and products. According to the authors, it is advisable to transfer certain types of control over the supply of such facilities to the Federal service for technical and export control (FSTEC) and make changes to the List of pathogens (pathogens) of humans, animals and plants, genetically modified microorganisms, toxins, equipment and technologies subject to export control [14], [15].

The list includes genetically modified microorganisms belonging to the 29 or 30 group Foreign Economic Activity Commodity Nomenclature (FEACN). It should be noted that products manufactured using genetically modified organisms are not included in these lists.

V. RESULTS AND KEY FINDINGS

The relevance of this study is explained due to the dual nature of the goods produced by genetic engineering modification.

In order to improve the efficiency of control over GMO raw materials and goods transported across the customs border, according to the authors, it is advisable:

- certain types of control over the supply of dual-use objects to transfer to the Federal service for technical and export control (FSTEC) [16];
- make changes to the List of human pathogens (pathogens), of animals and plants, genetically modified microorganisms, toxins, equipment and technologies subject to export control;
- use the experience of FSTEC, giving it the authority to control GMOs;
- to recognize the category of dual-use goods when moving across the customs border, it is necessary to develop effective methods for the identification of such goods.

VI. CONCLUSION

The results of the research can be used in the development and justification of proposals to improve the mechanisms of technical regulation in terms of food security.

Improving the efficiency of the Institute of technical regulation in terms of food security can be achieved by introducing reasonable changes and additions to the regulatory legal documentation regulating the requirements for the quality and safety of goods transported across the customs border within the EAEU.

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