

## FOOD SECURITY AND TECHNICAL REGULATION OF REQUIREMENTS TO FOOD PRODUCTS

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**Abstract.** Rational consumption norms, state food resources, indicators of food safety and quality are the important indicators of food safety, therefore, regulatory requirements should be developed, these are advisable to be presented in the form of special sections of standards or individual standards regarding the characteristics of foods intended for long-term storage. In order to accomplish the tasks of technical regulation relating to food safety, it is advisable to develop a regulatory document of national level, which would be used by all developers of food standards. According to the results of the work performed, the corresponding guidelines were developed.

**Keywords:** regulatory documents, national standards, food safety, standards, technical regulation, specifications, food quality.

The problem of human security is complex and multidimensional, but experts distinguish two main aspects of this concept: protection against such chronic threats as hunger or disease, as well as protection from sudden and undesirable changes in everyday life. Threats to human security can be divided into seven main categories: economic, food, medical, environmental, personal, public and political [1]. Food security is now a global problem, the solution of which depends on providing consumers with an adequate supply on a global scale with safe, affordable and nutritious food products – both fresh and properly processed. The task of providing healthy nutrition to 9 billion people by 2050 will be partly solved by increasing the production of food products. Only partly – as other measures in this direction should be taken to reduce food losses throughout the supply chain from production to consumption, to increase the content and improve nutrient preservation, ensure food safety and to ensure proper storage of food by appropriate technological processing [2-4].

According to the Declaration of the Food and Agriculture Organization of the United Nations (FAO), food security is ensured when all people at any time have physical and economic access to safe and wholesome food sufficient to satisfy their physiological needs and benefits necessary for an active and healthy lifestyle [5]. There is a definition of food security as constant availability of food in quantities sufficient for active healthy lifestyle of the entire population – this means free access to healthy food of appropriate nutritional value; guaranteed opportunity to get food without involving food supply channels provided for in case of emergencies and disasters, without any consumption of food waste, theft of food, etc. [6]. According to [7], there are three principal components of food security: availability as the degree of actual or potential affordability of food in a certain group of the population during a certain period; accessibility, as the degree of the population's ability to receive food at its disposal during a certain period of time; consumption, as the ability of the population to provide enough nutritious food for a certain period of time. Consequently, the concept of food security, along with economic aspects, incorporates a number of technical components, such as: alimentary and nutritional value of food, other physical and chemical characteristics, suitability for transportation and short-term and long-term storage.

The economic aspects of food security are widely and minutely characterized in scientific sources, but its technical and technological problems have not yet been widely reflected in the works of scientists, the sources on this issue are sporadic, and the information in them is quite fragmentary. For example, the authors of [8], among the factors ensuring the effective functioning of the food safety system, recall the promotion of the use of advanced technologies in the production, storage and processing of raw materials for food production. It is necessary not only to achieve compliance with the food safety criteria in terms of the amount of food products, but

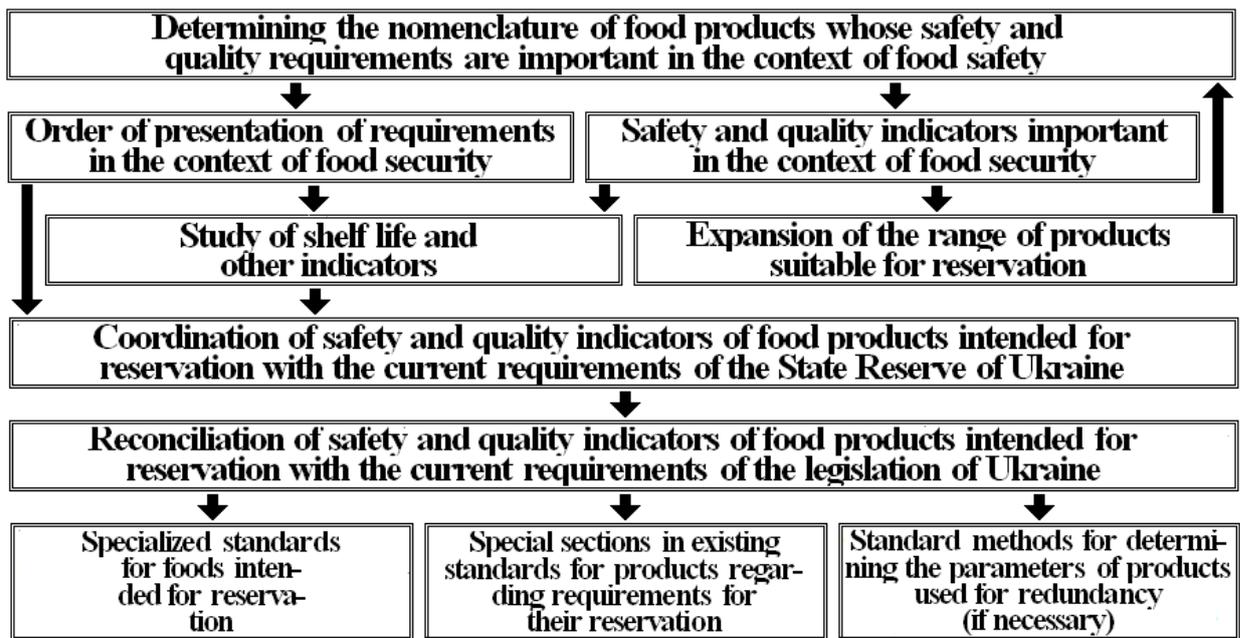
also to ensure their compliance with good nutritional standards, safety and quality requirements through proper coordination of agriculture and the industry for processing agricultural raw materials and production of foods [9]. So, the safety and quality of food products are fundamental components of the overall structure of the food security of a state; therefore, their provision is prompted by consolidated targeted actions in areas such as food safety and technical regulation. Accordingly, the proper involvement of technical regulation is necessary in the field of food safety and quality to form an integrated structure of food security of state, ensure regulatory support for this system and its full and rapid implementation as an important component of the security of state in general [10].

According to the Law of Ukraine in force “On technical regulations and conformity assessment” [11] the technical regulation is defined as legal regulation of relations in the field of determining and fulfilling mandatory requirements for product characteristics or related processes and production methods, as well as checking their compliance by assessing compliance and / or state market supervision and control of non-food products or other types of state supervision (control). Basing thereon, it is rational to form a new architecture of normative regulation of the issue of food security. This system should consist of the Law of Ukraine “On Food Security”, which would cover the economic aspects of the problem and contain references to a number of mandatory national standards, the scope of which would be the technical and technological requirements for relevant food products. Among these requirements, the mandatory safety norms and a certain nomenclature of food quality norms defined by the current legislation of Ukraine will find their due consideration. The main directions for taking into account food safety requirements in technical regulation are rational consumption norms, state food resources, food safety and certain indicators of their quality, this also applying to standardization as part of technical regulation. The standardization at the level of national standards, properly harmonized with the EU and international standards, makes it possible to fulfill the function of economic and technical integration. Together with fulfilling the function of transfer and interchange of technologies standards are being increasingly used as the instrument to select certain technology [12].

The algorithm for implementing the principles of food safety in the regulatory documents of the level of national standards, compiled in the course of the research, is presented in the Picture 1 [10]. It shall be noted that the issue of safety and quality of food products, as part of the concept of food security in Ukraine has been, to a sufficient part, successfully resolved. In 2018, Ukraine took the 46th place in the Food Quality and Safety Component of the Global Food Security Index (GFSI), surpassing the world average. It is quite realistic to improve the position of our state in this ranking, which, in particular, should be contributed by proper coordination of Ukrainian legislation in the field of food safety and quality with the relevant EU normative documents [13].

The extensive experience of work on standardization accumulated by experts of the Technical Committee for Standardization TC 140 “Milk, meat and the products of their processing”, Institute of Food Resources of NAAS (IFR NAAS) fulfilling the functions of its secretariat, gives grounds to assert that the specifications of foods normed by national standards contain physical and chemical parameters adapted to the typical conditions of the food market, but not taking into account the special requirements for their state reserving on stocks their design and equipment providing the preservation of consumer properties for a significantly longer period of time with subsequent use thereafter. We reasonably believe that the solution to this problem is possible:

- by developing special standards to norm is the technical specifications for food products intended for reservation;
- in case of adding into the existing standards of the relevant components – the special requirements for the use food products normed by these standards for the purpose of reservation;
- through the development of standards for methods for determining indicators of food products, which are important in the sense of its preparation for reservation and its implementation in practice.



Picture 1 - The scheme of the algorithm of expedient involvement of the basics of food safety in regulatory documents of the national standard level [10]

In order to fully attract food safety issues in the framework of the implementation of technical regulation, IFR NAAS developed a “Database of regulatory documents on the joint sphere of regulation of food security, food safety and food quality”, which contains the necessary information about the entire regulatory framework of the standards of nation-wide force these relating foods and methods for determining their safety and quality parameters. Another database we have created, namely, the “Database of food products used to solve the problems of state food security and characteristics of these foods”, includes standards of nation-wide force rationing specifications for food products and food raw materials that are used, or can be used, to solve strategic problems of food security by creating reserves of long-term storage at special storage facilities [12]. The database has been compiled in accordance with the requirements to safety and quality indicators for the following food product groups: meat and meat products, canned meat and meat/cereal foods, canned milk and dry milk products, butter, frozen fish, canned fish, cereals and flour, bakery products and flour, oil and fat products, sugar, tea, etc. – for all the specified groups of food products and food raw materials, represented by the relevant standards in force in Ukraine, typical lists of safety and quality parameters are adduced. The proposed grouping of regulatory documents and parameters should contribute to the optimizing of further work on bringing food safety requirements to the elements of the current system of technical regulation being in force in Ukraine.

Let us consider the case of the development of a specialized national regulatory document to address food safety requirements. In accordance with the norms of [14], the title of the standard is formed according to two component scheme: the structural element of the main part “Title” must be made up of the main component, which distinguishes a specific food product or a technologically due group of food products, and an additional component that properly discloses a special purpose developed standard that is: “Specifications of use for ensuring the food security of the country”, “General specifications of use for ensuring food security of the state” or, in technically and normatively reasonable cases, “Specifications of state reservation”, “General specifications of state reservations”, etc. In the structural element of the main part “Scope of application”, it should be noted that its scope are the specifications of the use for ensuring food security of the country, the general specifications of use the use for ensuring food security of the state, in technically and normatively justified cases, the specifications of state reserving, the general specifications of state reserving or other, more specific rules in the framework of solving

the food security issues. In the section “Terms and definitions” it is advisable to involve the following positions:

- the concept of “food security” with the definition as “socio-economic and environmental situation in which all social and demographic groups of the population are stably and guaranteedly provided with safe and high-quality food in the required quantity and assortment necessary and sufficient for physical and social development of a person, ensuring health, etc.”;

- the concept of “food security of the state” with the definition as “socio-economic and ecological situation of Ukraine, in which all social and demographic groups of its population are stably and guaranteedly provided with safe and high-quality food in the required quantity and assortment necessary and sufficient for the physical and social development of a person, ensuring health, etc. ”;

- the concept of “state reservation of foods” with the definition as “creating stocks of raw materials and food resources to ensure the strategic needs of the state, to carry out priority work in the aftermath of emergency situations and to perform other activities provided for by the legislation”;

- the concept of “strategic needs of the state for food” with the definition as “the needs of the state for stocks of food resources necessary to ensure the national security of the state, stabilize its economy and carry out priority work in the aftermath of emergency situations”.

The above terms and definitions can be supplemented by other ones – in accordance with the objectives and content of the standards being developed.

According to the norms of [15] the structural element of the standard "Requirements / Provisions for the object of standardization" lays out the essential part of the standard (rules, regulations, requirements, methods, etc.). We believe that a specialized standard for attracting food safety requirements should contain:

- nomenclature of food products to which the norms of the standard apply;
- full list of physical and chemical, structural-mechanical and other relevant parameters of food raw materials and food products to which the norms of the standard apply;
- specific information on the timing, temperature and humidity, and other relevant storage parameters for food raw materials and food products brought in to fulfill food safety objectives;
- installations for the packaging and transportation of food raw materials and food products brought in to fulfill the tasks of ensuring food security;
- guidelines for laying in, selling, issuing and refreshing stocks of food raw materials and food products after the end of the regulatory period of the state reservation;
- requirements to be specified in accordance with the object of standardization.

The said requirements, in addition to the structural element "Requirements / provisions for the object of standardization", are also noted in the structural elements "Marking", "Packaging", "Rules of transportation and storage", "Methods of control" and "Rules of acceptance".

When food standards are modified to take food safety issues into account, in accordance to [16], amendments shall be developed to the said standards enhancing the “Scope of application” component with the following sub-clause: “State reservation requirements are set forth in [numbers of components]”. The obligatory component “Terms and Definitions” can be amended with pairs of terms and definitions: “food security”, “food security of the state”, “state food reservations”, “strategic needs of the state for food”, etc. supplemented with the normative text “Depending on the purpose [the names of food products] are divided into those intended for direct market turnover and are intended for state reservation.”

In case of modification of the current standard, the “Requirements / Regulations for the Standardization Object” component should be amended with requirements and provisions similar to those given above with respect to specialized national regulatory documents, the purpose of which is to take into account food safety requirements. Also, these requirements, in addition to the structural element "Requirements / Provisions for the object of standardization", are added to the structural elements "Marking", "Packaging", "Rules for transportation and storage", "Methods of control" and "Rules for acceptance". It is important to amend the structural element “Marking”

with the entry “Food product intended for state reservations, shall be marked “Suitable for state reservations”. The order and features of the packaging of food products intended for state reserving should be provided for in the “Packaging” structural element, and appropriate and packages and packaging materials should be specified. If it is necessary to use additional methods of control of food products intended for state reservation, the standard structural element of the same name is supplemented accordingly. In the structural element "Rules of admission" in relation to food products intended for state reservation, establish special norms, based on the specifics of these products.

The analysis of the problem of mutual consideration of technical regulation and food safety to have been made proves the possibility and expediency of involving food safety issues in technical regulation regarding food raw materials and food products, formulating recommendations for practical consideration of food safety requirements in normative documents of different level: national standards, other standards, specifications. It is advisable to implement this accounting by modifying existing normative documents and developing the new ones. Practical ways to implement the principles of food safety in technical regulation by developing the “Guideline for presentation of food safety issues in the regulatory documents of different levels that define the requirements for food products” are shown.

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## **ПРОДОВОЛЬСТВЕННАЯ БЕЗОПАСНОСТЬ И ТЕХНИЧЕСКОЕ РЕГУЛИРОВАНИЕ ТРЕБОВАНИЙ К ПИЩЕВЫМ ПРОДУКТАМ**

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**Аннотация.** Нормы рационального потребления, государственные продовольственные ресурсы, показатели безопасности и качества пищевых продуктов являются важными параметрами продовольственной безопасности, поэтому необходимо разработать нормативные требования, которые целесообразно представить в виде специальных разделов стандартов или отдельных стандартов, касающихся характеристик пищевых продуктов, предназначенных для длительного хранения. Для выполнения задач технического регулирования, касающихся продовольственной безопасности, целесообразно разработать нормативный документ национального уровня, который будет использоваться всеми разработчиками стандартов на пищевые продукты. По результатам выполненных работ были разработаны соответствующие методические рекомендации.

**Ключевые слова:** нормативные документы, национальные стандарты, продовольственная безопасность, стандарты, техническое регулирование, технические условия, качество пищевых продуктов.

## **АЗЫҚ-ТҮЛІК ҚАУІПСІЗДІГІ ЖӘНЕ АЗЫҚ-ТҮЛІККЕ ҚОЙЫЛАТЫН ТАЛАПТАРДЫ ТЕХНИКАЛЫҚ РЕТТЕУ**

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**Аңдатпа.** Рационалды тұтыну стандарттары, мемлекеттік азық-түлік ресурстары, азық-түлік қауіпсіздігі және сапа көрсеткіштері азық-түлік қауіпсіздігінің маңызды параметрлері болып табылады, сондықтан стандарттардың арнайы бөлімдері немесе сипаттамаларға қатысты жекелеген стандарттар түрінде ұсынылатын нормативтік талаптарды әзірлеу қажет. ұзақ уақыт сақтауға арналған тамақ өнімдері. Азық-түлік қауіпсіздігімен байланысты техникалық реттеу тапсырмаларын орындау үшін ұлттық деңгейде азық-түлік стандарттарын әзірлеушілер қолданатын нормативтік құжатты

әзірлеген жөн. Жүргізілген жұмыс нәтижелері бойынша тиісті әдістемелік ұсыныстар әзірленді.

**Түйінді сөздер:** нормативтік құжаттар, ұлттық стандарттар, тамақ қауіпсіздігі, стандарттар, техникалық реттеу, техникалық жағдайлар, тамақ сапасы.