

ACTUAL PROBLEMS OF STANDARDIZATION OF FOOD PRODUCTS AND FEED IN THE REPUBLIC OF KAZAKHSTAN

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Abstract

Each food company should have its standard that focusses on consumer preferences. In the implementation of the concept of healthy nutrition for the population, one of the main places belongs to food safety. Moreover, the main criterion for evaluating products worldwide is quality, which determines the standard of living of society as a whole and each individual. The food of modern man contains several compounds that can present a potential health hazard. Such compounds primarily include heavy metals, pesticides, nitrates, nitrites, N-nitrosamines, bacteria, and bacterial toxins, as well as toxins of microscopic mold fungi, called mycotoxins. Environmental contaminants pose the greatest danger to human health because they are extremely widespread and are found in almost all types of food products of plant and animal origin. The aim of this research was to make an analysis of the regulatory and methodological framework of the Republic of Kazakhstan for the production of functional food products of the food-concentrate industry, such as: multi-cereal pasta and co-extruded food products of a high degree of readiness on a multi-cereal basis.

As a materials for this research we used regulatory and methodological framework of the Republic of Kazakhstan for the functional food production that were compared with the same in European Union (EU) and the Russian Federation (RF). The article also discusses the importance of applying standards to feed products as an obligatory link in the technological chain of food production. Ensuring the safety of feed is mainly expressed in compliance with the norms regarding harmful substances. The feed safety management system should be changed in accordance with changes in legislation and accordance with other innovations in the field of safety. It should ensure a

clear and complete definition, implementation, and compliance with standards of all activities that may have an impact on the safety of feed. At the same time, the problem of lack of technical regulations on feed safety was noted.

The obtained results of the analysis of regulatory and regulatory and technical documents formed the basis for the development of enterprise standards and technical regulations for the production of new food products and feed being developed by us.

Key words: *Standardization, Food, Feed, Organization standards, Safety management.*

1. Introduction

The production of food and feed products is the basis of the food security of any state. To address food safety issues, it is necessary to regularly monitor the quality of food products and feed produced in the country or imported from abroad.

Normative and methodological support of food and feed production, is a set of documents approved in the prescribed manner, normative and reference materials, norms, rules, requirements, characteristics, methods, and other data used in solving technological problems of the organization of production and quality management and safety of finished food products and feed [1].

Currently, the requirements for the organization and management of the technological process of primary processing are regulated by the "Rules for the organization and management of the technological process at flour mills" (Part 1, 2, Moscow, 1991)

[10], and "Rules for the organization and management of the technological process at cereal enterprises" (Part 1, 2, Moscow, 1990) [11], and also, a number of other regulatory documents (national, interstate, industry standards; sanitary, building codes, rules, etc.). These Rules were developed and introduced by the All-Union Scientific and Production Association "Zernoprodukt".

Based on the analysis of these regulatory documents, it was revealed that in the Republic of Kazakhstan, the products of primary grain processing are regulated by a set of mandatory requirements. Table 1 shows a set of mandatory requirements for grain processing products in force in the Republic of Kazakhstan.

Table 1. Summary of mandatory requirements for grain and grain processing products in force in the Republic of Kazakhstan

Safety requirements	Mandatory requirements status*
Toxic elements (heavy metal salts):	
Lead	N
Arsenic	N
Cadmium	N
Mercury	N
Tin	NN
Chromium	NN
Nickel	NN
Copper	NN
Iron	NN
Radionuclides:	
Caesium-137	N
Strontium-90	N
Microbiological indicators	N
Mycotoxins:	
Aflatoxin B1	N
Aflatoxin M1	NN
Patulin	NN
Zearalenone	N
Deoxynivalenol	N
T-2 toxin	N
Pesticides:	
Hexachlorocyclohexane (alpha, beta, gamma isomers)	N
DDT (dichloro-diphenyl trichloromethylmethane) and its metabolites	N
Organomercury pesticides	N
Hexachlorobenzene	N
Nitrosamines	N
Benz(a)pyrene	N
Contamination and pest infestation of grain stocks	N
Harmful impurities	N
Production requirements	NN

Legend: N - normative; NN - non-normative.

2. Standardization of food products and feed in the Republic of Kazakhstan actual problems

As a materials for this research and the analysis, we used current and far back issued normative-legal and normative-technical documents (NTDs) operating on the territory of the Republic of Kazakhstan. Also, in order to harmonize and develop NTDs (enterprise standards and technological regulations), the international experience of the European Union (EU) and the Russian Federation (RF) was analyzed. Based on the results of the analysis, an array (information database) of safety indicators for the new food products and feeds we are developing has been formed [2 - 5].

The system of legislation in the field of grain processing industry products to some extent resembles (analogous to) the Codex Alimentarius system, and the European Union. It contains both horizontal and vertical regulatory documents [6].

Currently, the Republic of Kazakhstan has sectoral horizontal documents in this area on the following main issues [12 - 14]:

- Information for consumers;
- About the sanitary-epidemiological health of the population;
- Sanitary rules and norms - Hygienic requirements for the safety and value of food products.

The vertical ones include state and interstate standards for products of the grain processing industry, methods of testing, labeling, and packaging, and the creation of a quality management system.

One of the main factors ensuring the health of the population of the Republic of Kazakhstan is the relationship in the field of production and sale of food products. They are currently regulated by current laws and regulations as follows:

1. Fundamental laws of the Republic of Kazakhstan in the field of product quality and safety [7 - 9]:
 - Law of the Republic of Kazakhstan dated July 21, 2007 No. 301-III "On Food Safety" (with amendments and additions as of 01.07.2021);
 - Law of the Republic of Kazakhstan dated December 30, 2020 No. 396-VI "On Technical Regulation";
 - Law of the Republic of Kazakhstan dated July 16, 1999 No. 434-1 "On Certification" (as amended by the Laws of the Republic of Kazakhstan dated 15.01.01 No. 141-II; dated 11.07.01 No. 230-II; dated 15.12.01 No. 272-II);
2. Normative legal act of the Republic of Kazakhstan regulating the activities of public catering:
 - Sanitary rules "Sanitary and epidemiological requirements for food production facilities" approved by Order of the Minister of Health of the Republic of Kazakhstan dated April 28, 2021 No. KR DSM-36 [15].

3. Regulatory documents of economic entities:

- Standards of scientific, technical, and engineering societies and other public associations;
- Enterprise standards and technological instructions.

It should be noted that in the conditions of the formation of market relations, considerable attention is paid to the analysis of the activities of catering enterprises and the assessment of the quality of service, and the problems of internal standards of catering enterprises, taking into account the specifics of their functioning, have not been deeply developed and reflected in educational and scientific literature. The current legislation of the Republic of Kazakhstan includes special regulations and some norms that call for ensuring the proper quality of goods, works, and services. Such acts are Law of the Republic of Kazakhstan dated July 21, 2007 No. 301-III "On food safety". The central role in the fundamental legislation regulating this sphere of relations belongs to the normative legal acts on standardization [7, 9]. However, at present, the national quality control and food safety system in the Republic of Kazakhstan is imperfect and is limited only by technical regulation, that is, the identification of counterfeit products according to consumer statements and the investigation of cases of food poisoning.

Standardization is the activity of defining norms, characteristics, and rules to ensure the safety of products, services, and works for the environment, health, life, and property; information and technical compatibility, as well as interchangeability; quality of products, services, and works by the level of development of science, technology, and technology; defense capability and mobilization readiness a specific country. The legal basis of standardization in the Republic of Kazakhstan is established by the Law of the Republic of Kazakhstan dated December 30, 2020 No. 396-VI "On Technical Regulation" [8].

Standardization acts as a normative basis for ensuring product quality and at the same time performs 3 socio-economic functions:

- Ordering of objects (products, services, and works) formed in the process of scientific, technical, and creative work of people;
- Establishment of optimal organizational and technical, general technical, technical and natural technical and economic norms and requirements in normative documents on standardization;
- Law enforcement, i.e. the use and compliance with optimal standards and requirements that are established in regulatory documents on standardization.

After the entry into force of the Law of the Republic of Kazakhstan dated December 30, 2020 No. 396-VI "On

Technical Regulation", the rationing of requirements for products and technological processes of the grain processing industry and control over them is carried out according to a complex system of rules [8]. On the one hand, there are departmental rules and regulations adopted before May 13, 2004 (before the entry into force of the Law of the Republic of Kazakhstan "On Technical Regulation"), on the other hand, new legislative provisions have entered into force prohibiting departments from adopting mandatory acts and establishing mandatory requirements and norms.

Using the above-mentioned legislative acts of the Republic of Kazakhstan, it can be confirmed that the problem of ensuring food safety is the most important state and scientific priority aimed at preserving and improving the health of the population, and the production of high-quality and safe food and feed.

All over the world, standardization is a tool for solving important state tasks, such as protecting the market from dangerous and low-quality products and introducing innovative technologies and information systems in various industries, including feed. The effectiveness of the application of standards contributes to the overall improvement of technological compatibility and global competitiveness of agribusiness, and also allows us to comply with the processes developing in the world aimed at interaction and integration both in the Eurasian Economic Union and in the EU countries.

The European Union has a system of directives defining requirements for food products based on the principles of the "New Approach". In addition to the directives of the "New Approach", the previously adopted directives of the "Old Approach" are also in effect, resembling interstate standards and national standards of the Republic of Kazakhstan, but, as legislation develops, they are either cancelled or do not fully operate, but in the part allowed by the rules of the "New Approach" [1, 6].

The "new approach" implies a transition from regulation by product type ("vertical" regulations) to broader regulation based on a small number of mandatory documents (Directives) defining general requirements for entire industries and activities ("horizontal" industry regulations). Thus, in the field of food products in the EU, a "grid" of a small number of groups of horizontal and vertical Directives and Regulations is being created and in many respects already in effect.

The vertical Directives of the European Union include the following: cocoa and chocolate products; types of sugars; honey; fruit and berry juices; extracts of chicory and coffee; jam, jelly, marmalade; milk and

dairy products; meat and meat products; mineral water; alcoholic beverages; wine-containing drinks and cocktails; eggs; fats of a smearing consistency; drinking water; seafood.

Horizontal directives include the EU directives adopted on the following issues [2 - 4]:

- Hygiene of food production;
- Labeling, labeling, and packaging of food products;
- Food additives, including mixtures of food additives, sweeteners, food colors, and flavors;
- Residual content of pesticides in products;
- Radioactive contamination of products;
- Materials in contact with food;
- Contaminants;
- Special purpose products;
- Fast-freezing products;
- Eco-friendly and new products.

The basic principle of the “New Approach” in the food industry is as follows: if products are made from authorized substances and materials and their mixtures listed in the “horizontal” Directives, then they are released to the market freely and do not require any additional pre-market permits and inspections by government agencies.

However, regarding feed products, there are no technical regulations on the safety of feed and feed additives yet, which in some way complicates the work of conscientious feed manufacturers. At the same time, this plays into the hands of unscrupulous producers: it is difficult to identify compound feeds, and there are no methods for detecting falsifications. This explains the relevance of developing an organization standard (OS) or technical specifications (TS) for all types of productive and unproductive animals for any feed products, taking into account all the requirements of existing legislation.

It should be recalled that the cost is mainly developed for the following types of feed products for farm animals [5]:

- Compound feed;
- Feed mixtures;
- Premixes;
- Feed concentrates;
- Protein-vitamin-mineral concentrates;
- Feed additives;
- Processed grain (extruded soy, grain mixture);
- Mineral raw materials for the production of compound feeds for farm animals and poultry and for feeding poultry;
- By-products of the sugar industry (molasses, pulp);
- By-products of the starch and treacle industry (cereal extracts, gluten, corn feed);
- Waste and by-products of the oil and fat industry

(husk, cake, meal);

- By-products of the alcohol industry (barda);
- By-products of the brewing industry (malt sprouts shot);
- Products of the canning and vegetable drying industry (grape and fruit pomades);
- By-products of the milling and cereal industry (bran, flour, cuttings).

The organization's standard (OS) or technical specifications (TS) are also being developed for feed and treats for unproductive animals (dogs, cats, rodents, ornamental birds).

The law forms the legal basis of a unified state policy in the field of standardization, its goals, and principles, and is aimed at increasing the role of standardization in the technical re-equipment and modernization of production, and the introduction of innovative technologies in all industries, including feed.

The quality of any product is based on its compliance with generally recognized standards and sanitary norms and rules. The standard based on which the products are made, subject to its conscientious observance by the manufacturer, is a quality guarantee, that is, the level of quality of the manufactured food products and compound feeds also depends on the level of standardization.

3. Conclusions

- On the basis of the analysis of existing regulatory documents, it was revealed that in the Republic of Kazakhstan, the products of primary grain processing are regulated by a set of mandatory requirements for grain processing products.
- After the entry into force of the Law of the Republic of Kazakhstan dated December 30, 2020 No. 396-VI “On Technical Regulation”, the rationing of requirements for products and technological processes of the grain processing industry and control over them is carried out according to a complex system of rules. Namely, on the one hand, departmental rules and regulations adopted before May 13, 2004 (before the entry into force of the Law of the Republic of Kazakhstan “On Technical Regulation”), and on the other hand, new legislative provisions prohibiting departments from adopting mandatory acts and establishing mandatory requirements and norms have come into force.
- It should be taken into account that a large number of vertical standards of the Codex Alimentarius makes this system imperfect for taking it as a basis for the development of national technical regulations of individual states.
- The European rules are well developed, tested in practice, and can be adapted for the Republic of

Kazakhstan without serious additional costs. Two decades ago, the European Union solved the same task that we are solving now - to stimulate economic growth and innovation by removing unjustified restrictions. At the same time, it should be taken into account that the European Union is characterized by an extremely cumbersome system of documents of different levels. This is primarily due to the fact that many of them relate not to the sphere of technical regulation but to the sphere of market organization. In addition, EU documents are rarely reissued; instead additions and changes to them are accepted, having their names and encodings. As a result, each document turns into a set of a huge number of additions, changes, and clarifications that have their numbers and names.

- Although the Russian system is harmonized in structure with the European and American, it has nothing in common with its content since it is extremely confusing, there is no clarity about which documents are valid and which are no longer, how many of them there are, taking into account that they are issued by different departments in the same the same areas - no one knows for sure. Because of this, the Russian system is rather a confusing mixture of the European system and the rules of the Codex Alimentarius. It is precisely such problems that will have to be solved first of all when developing technical regulations for the production of food products and feed in the Republic of Kazakhstan.

- From the above analysis, it follows that almost all levels of the system of legislation in the field of food products, including in the field of grain and grain products, have a similar structure and fundamentally differ only in the number of regulatory documents.

- Products manufactured in compliance with the requirements of standards, provided that they are faithfully observed by the manufacturer, are a guarantee of quality, that is, the level of quality of manufactured food and feed depends on the level of standardization.

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