# ХАРЧОВІ ТЕХНОЛОГІЇ

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## INTERNATIONAL ASPECTS OF CONTROL IN FOOD QUALITY AND SAFETY MANAGEMENT

*The article is devoted to the analysis of the state of food safety and quality in Ukraine against the background of international regulatory practice. The purpose of the study is to assess national legislation, institutional support and comparison with global standards to identify ways of harmonization. The main provisions of food safety in Ukraine are regulated by the Law "On Food Safety and Quality" dated December 23, 1997 No. 771/97-VR (as amended), where safety is defined as the state of a product that does not harm the health of the consumer, provided that sanitary measures and technical regulations are observed, and quality is defined as the degree of satisfaction of consumer needs. In international practice, the key tool is the Codex Alimentarius – a collection of standards developed under the auspices of FAO/WHO since 1963 by the Codex Alimentarius Commission. The Commission's activities are aimed at protecting consumer health, ensuring fair trade, coordinating standards, setting priorities, editing and publishing norms. Codex covers standards for raw, semi-processed and processed products, hygiene regulations, additives, pesticides, contaminants, labelling, methods of analysis. Other international organisations include ISO (since 1946), which coordinates national standards, develops standards, exchanges information and cooperates with the UN; the United Nations Economic Commission for Europe (UNECE, since 1947), which develops conventions, standards for the harmonisation of trade, consumer protection and the environment, focusing on perishable products; The European Committee for Standardization (CEN, since 1961), which creates European standards (EN) for EU countries. In the EU, the General Food Law of 2002 created the European Food Safety Authority (EFSA, since 2003) for risk assessment and advice. National systems vary between centralized (Netherlands, Denmark) and decentralized (Spain, Germany). In European countries, tasks and powers are distributed between different bodies: in Estonia, the Veterinary and Food Department under the Ministry of Agriculture, in Sweden, the National Food Administration for consumer protection, in Germany, the Federal Ministry for Consumer Protection and the Federal Institute for Risk Assessment, in Poland, a reform to create a single body under the Ministry of Health, coordinated with the EU. Manufacturers implement quality systems (ISO, HACCP, GMP), which are more effective than certification of finished products, regulating the entire chain from raw materials to packaging.*

***Keywords:*** *HACCP, Codex Alimentarius, quality control, safety, expertise, quality management, audit, standardization, certification, international trade.*

**Statement of the problem and its relevance.** The globalization of the food market has led to a rapid increase in international food trade, which is accompanied by the complexity of supply chains and the increase in risks to public health. Hundreds of millions of cases of food poisoning are registered worldwide every year, a significant part of which is associated with products that cross the borders of several countries. At the same time, regulatory requirements for the quality and safety of food products in different regions of the world differ significantly [1–4].

The same product may be considered safe in one country but banned in another, which creates significant barriers to trade, increases costs for producers and at the same time does not always provide adequate protection for consumers at the global level. The rapid spread of new threats – from resistant pathogens and nanoparticles to alternative sources of plant-based protein – requires regulatory systems to adapt quickly. Complex multi-component products and deeply processed goods make control difficult, and different approaches to the assessment of pesticide residues, veterinary drugs, mycotoxins and other contaminants in different jurisdictions lead to inconsistent standards [5–7].

The precautionary principle that dominates European regulation contrasts with more pragmatic approaches in other parts of the world, which makes it difficult to reach consensus. In addition, traceability systems often prove to be insufficiently effective in cross-border supplies, and international Codex Alimentarius standards do not always take into account the real technical and economic capabilities of developing countries. This indicates a significant gap between the declared goal of creating a single safe food area and the actual level of harmonization of requirements, control methods and surveillance mechanisms [8–10].

Modern international instruments do not always have time to respond to new challenges, which emphasizes the need to find balanced solutions. Solutions should simultaneously ensure a high level of consumer health protection and prevent the emergence of unjustified technical barriers to trade, which is a key task for the further development of international quality control and food safety in a globalized world [11–13].

**Analysis of recent research and publications.** Ethiopian researchers (Tibebu A., Tamrat H. and Bahiru A.) in a review paper analyzed 37 studies on the impact of food safety on global trade. They highlight how population growth and agricultural intensification in developing countries are increasing food poisoning, causing trade restrictions, financial losses and resource depletion. The authors emphasize the role of Codex Alimentarius in harmonizing standards, criticize the fragmentation of regulations that creates trade tensions and vulnerability of small producers, and propose a review of global regulatory networks to balance rights and obligations under WTO standards, with a special emphasis on social inequalities in poor regions [14].

A Nigerian scholar (Eruaga M.A.) focuses on policy harmonization and international cooperation. It highlights the role of WHO, FAO and Codex Alimentarius in establishing science-based standards through consultation and consensus, identifies challenges (regulatory divergence, lack of institutional capacity in low-income countries, geopolitical tensions) and suggests technologies (blockchain for traceability, IoT for monitoring, AI for risk analysis) and public-private partnerships for knowledge sharing, emphasizing practical solutions and the role of innovation as a bridge between developed and developing countries [15].

Irish researchers (Pai A.S., Jaiswal S. and Jaiswal A.K.) analyze the evolution of the food safety culture (FSC) from simple compliance to a key organizational value. They highlight the role of transformational leadership, organizational commitment and cultural diversity in multicultural teams, compare sectors (meat and dairy) where FSC is stronger in high-risk industries due to regulatory pressure, but note challenges in communication and employee engagement. They recommend behavioral training and adapted approaches for sustainable FSC, adding a sociological dimension and identifying gaps regarding multicultural influences in globalized chains [16].

Romanian and Norwegian authors (Radu E., Dima A. et al.) in a Scopus-based bibliometric analysis trace global trends in quality management systems, in particular HACCP, over more than 40 years. They document the growth of publications since the 1990s, the change in leadership (USA until 2012, then Italy, UK, China, Greece), key themes (foodborne illnesses, risks, supply chains) and suggest a focus on improving safety, quality, sustainability and adapting to changing demand and regulations, criticizing the lack of research in developing countries [17].

A Chinese researcher (Chen M.) provides an overview of quality control to ensure safe products, highlighting the importance of preventing contamination, pathogens and allergens to comply with FDA and EFSA regulations. The author highlights the role of control in preventing foodborne illnesses, maintaining brand reputation and increasing concerns about contamination, offering a pragmatic guide for industry, emphasizing the need to comply with international standards for global trade [18].

**Objectives of the article.** The purpose of the article is to study the state of food safety in Ukraine and review international practice in ensuring food quality and safety.

**Summary of the main research material.** The main provisions of food safety and quality are determined by the Law of Ukraine "On Food Safety and Quality" dated December 23, 1997 No. 771/97-VR with subsequent amendments and supplements [1], according to which food safety is the state of a food product that is the result of production and circulation activities carried out in compliance with the requirements established by sanitary measures and/or technical regulations, and provides confidence that the food product does not harm human (consumer) health if it is consumed for its intended

purpose. Article 1 of the same law defines the quality of a food product as the degree of perfection of the properties and characteristics of a food product that are able to satisfy the needs (requirements) and wishes of those who consume or use this food product. In Ukraine, the following state institutions ensure the development, approval and implementation of sanitary measures regarding the safety and quality of food products: the Cabinet of Ministers, the Ministry of Health, the Ministry of Agrarian Policy and Food, the State Sanitary and Epidemiological Service, the State Service for Technical Regulation, the State Service of Veterinary Medicine, the State Inspectorate of Ukraine for Consumer Rights Protection, etc.

An important area of state regulation of food safety is the development of standards that determine the composition of the product, permissible levels of harmful substances. In international practice, the Codex Alimentarius has become the basis for ensuring food safety. The Codex Alimentarius is a collection of internationally approved and uniformly presented standards for food products, developed under the leadership of FAO/WHO, aimed at protecting consumer health and ensuring fair practices in trade in them. The said collection was prepared and published by the Codex Alimentarius Commission. The Codex Alimentarius Commission was established in 1963 by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) as their subsidiary body for the implementation of the joint FAO/WHO food standards program.

The activities of the Codex Alimentarius Commission are aimed at: protecting consumer health and ensuring fair practices in the food trade; promoting the coordination of work on food standards carried out by international governmental and non-governmental organizations; determining priorities, initiating and guiding the preparation of draft standards through and with the assistance of relevant organizations; finalizing the standards and, after their adoption by governments, publishing them in the Codex Alimentarius; improving published standards after appropriate revision.

The Codex Alimentarius contains standards for all major types of food products – raw, semi-processed and processed, which are intended for supply to the consumer. Materials for further processing into food products are included in the stages to a certain extent necessary to achieve the objectives set out in the Codex. The Codex Alimentarius includes provisions on food hygiene, food additives, pesticide residues, contaminants, labeling and presentation of products, methods of analysis and selection. In addition, it also contains provisions of a recommendatory nature that the international community should follow to protect consumer health and ensure uniform trading practices, in the form of rules and regulations, guidelines and other documents that contribute to achieving the objectives of the Code [19–21].

Codex Alimentarius standards include requirements for food products aimed at guaranteeing the consumer a healthy, safe food product, free from adulteration, correctly labeled and presented. A Codex Alimentarius standard for any product or products is developed in accordance with the Codex format for product standards and contains the appropriate criteria [22–24].

In Ukraine, the National Commission of Ukraine on the Codex Alimentarius (NCCA) was established by the Resolution of the Cabinet of Ministers of Ukraine No. 169 of February 16, 1998 "On the Establishment of the National Commission of Ukraine on the Codex Alimentarius Food Products". The Commission operates on the basis of Article 8 of the Law of Ukraine "On Food Safety and Quality" (No. 771/97-вр dated December 23, 1997, as amended by Law No. 2809-IV (2809-15) dated September 6, 2005) and the Resolution of the Cabinet of Ministers of Ukraine dated July 3, 2006 No. 903 "Questions of the National Commission of Ukraine on the Codex Alimentarius". During its activities, the Commission has considered standards on permissible doses of pesticides, antibiotics, hormones in food products.

In addition to the Codex Alimentarius Commission, there are other international organizations in the world that are designed to develop and coordinate international and national standards. Let us consider the most important of them [25, 26]. The International Organization for Standardization (ISO) has been operating since 1946 as a non-governmental structure. The main activities of ISO include: activities that promote the coordination and unification of national standards; development and approval of international standards; exchange of information on standardization issues; cooperation with other related international organizations. ISO has consultative status with the UN and is the largest international organization in the field of standardization on a wide range of issues, whose members are also not governments, but national regulatory structures [27, 28].

The United Nations Economic Commission for Europe is one of the five regional commissions of the United Nations. It was established in 1947 by the United Nations Economic and Social Council with the aim of promoting economic activity and strengthening economic ties within the region and between the region and the rest of the world [29].

The UNECE serves as a regional forum for governments to develop conventions, norms and standards in order to harmonise action and facilitate the exchange of views among member states. The UNECE provides guarantees of safety and quality to consumers, helps protect the environment, simplifies trade procedures, and promotes greater unity among member states within the region and their greater integration into the world economy [30, 31].

The UNECE develops standards mainly for perishable products and unprocessed products that are raw materials. The European standardization model supports the concept of a developed state, common to all Western European countries, obliged to reconcile the democratic, social and cultural interests of society with a market economy. National bodies are associations with which the government

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concludes agreements on the performance of certain state administrative functions.

The European Committee for Standardization (CEN) has existed since 1961. CEN members are the national standardization organizations of the European Union (EU). This organization develops European standards (EN) that are valid in the EU member states. In 2002, the EU introduced the General Food Law, which defined the general principles and procedures for ensuring food safety. Within the framework of this law, the Single Food Safety Authority was established. This organization began its activities in 2003, paying attention to risk assessment and scientific advice in the field of food safety. In recent years, most EU countries have established National Food Safety Authorities in order to achieve higher standards of food safety and to ensure effective control. The functions and tasks of these organisations may vary between Member States. In some countries their mandate is limited to carrying out risk assessments and providing scientific advice to the government, in others their mandate includes risk communication and enforcement of food control regulations. National control systems within the EU vary from country to country. They range from fully centralised systems (Netherlands, Denmark, Belgium) to decentralised systems where competent authorities operate on the basis of regional (Spain, Germany) or local systems (United Kingdom, Ireland) [31, 32].

In Estonia, the only state body responsible for food safety is the Veterinary and Food Department, which is subordinate to the Ministry of Agriculture. The main functional responsibilities of the department are to monitor the implementation of legislation in the field of veterinary medicine, food safety, market regulation, etc.

In Sweden, such a body is the Swedish National Food Administration, which is the central body of state power in the food industry. The main tasks of this body are to protect consumer rights regarding the quality and safety of food products, control food trade, etc.

At the same time, in Germany there are several bodies in the field of food control, namely: the Federal Ministry for Consumer Protection, Food and Agriculture of Germany and the Federal Institute for Risk Assessment. The functional responsibilities of the ministry are assigned to individual departments, namely food and industrial goods; plant protection products, veterinary medicine, genetic engineering. As for the Federal Institute for Risk Assessment, it is a scientific institution that prepares expert reports on food safety and consumer health protection based on international scientific assessment criteria [32–34].

Poland is currently undergoing a reform of the structure and organization of official control, as well as legislative reform. In order to align Polish regulations with those of the EU, a new Food Act has been adopted. Further reforms of the monitoring and surveillance systems for the purpose of official food control are being carried out. Poland intends to create a single food authority, similar to the Food Standards Agency in the UK. This unified food control system will be subordinate to the Ministry of Health.

In addition, the quality and safety of products is controlled by the producers themselves and ensured by enterprises implementing quality systems such as ISO, HACCP and Good Manufacturing Practice standards. Encouraging the implementation of such quality systems that fully regulate the production process is a more effective measure to ensure product quality during its production (stages: raw materials, production, packaging), than certification of finished products, which, as noted above, does not justify its effectiveness in practice [33].

In Ukraine, despite the adopted regulatory acts and the activities of state institutions designed to control food quality, the problem of food safety is quite acute. Therefore, one should agree with Sadyekov A.A. and Porodina L.V. that the organizational and legislative basis of state regulation of the safety and quality of food products and food raw materials in Ukraine has not actually undergone significant changes (despite the adoption of a number of fundamental laws and draft laws), remaining oriented towards the principles of the socialist economy. Most of the legislative acts adopted over the last decade, in the absence of powerful consumer and industrial associations, are doomed to meet the interests of state regulatory bodies, and not the interests of society. After all, some steps in this direction are being taken and experience is being gained [35–37].

**Conclusions.** The main directions of ensuring food safety in Ukraine should be the development of modern standards and, what is especially relevant, compliance with approved standards. Modern standardization is based on the following basic principles: taking into account the level of development of science and technology, environmental requirements; economic feasibility and efficiency for the manufacturer and public benefit; involvement of all stakeholders in the development; adoption of standards subject to consensus, that is, in the absence of reasonable objections on important issues by the majority of stakeholders; openness of information about current standards and work programs; unambiguousness, clarity, consistency and reasonableness of the requirements of the ND and the possibility of their verification. A promising direction in ensuring food safety should be a mechanism for guaranteeing compliance with national standards through changes in legislation in the direction of introducing effective penalties for violation of standards, creating a new state institution that would monitor compliance with food standards.

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## МІЖНАРОДНІ АСПЕКТИ КОНТРОЛЮ В УПРАВЛІННІ ЯКІСТЮ ТА БЕЗПЕЧНІСТЮ ХАРЧОВИХ ПРОДУКТІВ

*Стаття присвячена аналізу стану безпеки та якості харчових продуктів в Україні на тлі міжнародної практики регулювання. Метою дослідження є оцінка національного законодавства, інституційного забезпечення та порівняння з глобальними стандартами для виявлення шляхів гармонізації. Основні положення безпеки харчових продуктів в Україні регулюються Законом «Про безпечність та якість харчових продуктів» від 23 грудня 1997 р. № 771/97-ВР (із змінами), де безпечність визначається як стан продукту, що не шкодить здоров'ю споживача за умови дотримання санітарних заходів і технічних регламентів, а якість – як ступінь задоволення потреб споживачів. У міжнародній практиці ключовим інструментом є Codex Alimentarius – збірник стандартів, розроблений під егідою FAO/WHO з 1963 р. Комісією Codex Alimentarius. Діяльність Комісії*

*спрямована на захист здоров'я споживачів, забезпечення чесної торгівлі, координацію стандартів, визначення пріоритетів, редагування та публікацію норм. Codex охоплює стандарти на сирі, напівоброблені та перероблені продукти, положення щодо гігієни, добавок, пестицидів, контамінантів, маркування, методів аналізу. Інші міжнародні організації включають ISO (з 1946 р.), що координує національні стандарти, розробляє норми, обмінює інформацію та співпрацює з ООН; Європейську економічну комісію ООН (ЄЕК ООН, з 1947 р.), яка розробляє конвенції, норми для гармонізації торгівлі, захисту споживачів та довкілля, фокусуючись на швидкопсувній продукції; Європейський комітет зі стандартизації (CEN, з 1961 р.), що створює європейські стандарти (EN) для країн ЄС. У ЄС Загальний харчовий закон 2002 р. створив Європейське управління з безпеки харчових продуктів (EFSA, з 2003 р.) для оцінки ризиків і консультацій. Національні системи варіюються на централізовані (Нідерланди, Данія) та децентралізовані (Іспанія, Німеччина). В країнах Європи завдання і повноваження розподілені між різними органами: в Естонії – Ветеринарно-продовольчий департамент при Аграрному міністерстві, у Швеції – Національна продовольча адміністрація для захисту споживачів, у Німеччині – Федеральне міністерство захисту прав споживачів та Федеральний інститут оцінки ризиків, у Польщі – реформа для створення єдиного органу під МОЗ, узгодженого з ЄС. Виробники впроваджують системи якості (ISO, HACCP, GMP), що ефективніше за сертифікацію готової продукції, регулюючи весь ланцюг від сировини до пакування.*

***Ключові слова:*** *HACCP, Codex Alimentarius, контроль якості, безпечність, експертиза, управління якістю, аудит, стандартизація, сертифікація, міжнародна торгівля.*

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