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CONTROL AND IDENTIFICATION OF FOOD PRODUCTS UNDER EC REGULATIONS AND STANDARDS

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ABSTRACT

Ukraine has a rich and wide range of opportunities to become one of the leading exporters of food products. To realize these opportunities, it is important to introduce a strict system of control and identification of products by harmonizing current standards with the standards of the European Union. Poor management of food safety at various stages of production, logistics, sales and storage leads to unplanned costs that can result in bankruptcy. There is a need to implement the product safety system called Hazard Analysis and Critical Control Point, which is due to the demand for high-quality and eco-friendly food products. The purpose of the study is to consider the essence and features of step-by-step Food Control, to reveal modern methods of Product Identification, taking into account European Food characteristics that affect the accuracy and nature of sanitary and hygienic provisions. In this research, the following theoretical and methodological approaches are used: actual analysis, structural and system approach, legal basis. The problem of rational state control over compliance with legislation in the field of food safety and quality grows, so the current business inspections should encourage Ukrainian producers to increase the volume of high-quality production, which deserves to represent the state on the European market, suspending illegal activities, falsification and deception of consumers. The practical significance lies in improving the control and identification of food products following the standards and regulations of the European Union for the effective improvement of business activities engaged in the production of food products.

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INTRODUCTION

To enter the European market, Ukraine needs to introduce a strict system of food safety control, which is a priority for both food producers and consumers, as well as for the government of the country. The potential of the agricultural sector of the economy in the context of Ukraine's acquisition of membership in the World Trade Organization (WTO) and future European integration prospects is assessed to a certain extent from the point of

view of ensuring and guaranteeing quality standards for industrial food products (Hevchuk and Christoffers, 2021). The experience of the European Union (EU) shows that it is necessary both to defend national commodity producers' interests and to take into account real economic opportunities to adapt to European standards and the European standard of living when expanding economic relations. In this context, priority areas for approaching EU food quality standards and technical

requirements should be clearly defined (Farr, 2019; Pankratova, 2021). The absolute majority of problems for Ukrainian exporters, due to the entry of new countries into the European Union, are the result of lagging behind them in the depth of socio-economic transformations, technological modernization, lack of sufficient funding for the certification structure following the requirements of international standards, the insufficient pace of work on the harmonization of Ukrainian standards, which cause a low level of competitiveness of Ukrainian products in the foreign market.

When placed on the market, food products must be safe for consumers. A significant part of products must meet the minimum commercial quality standards, both at the national and European. When placing products on the market, special attention should be paid to factors that are important for ensuring health safety. Achieving this goal is impossible with the traditional approach to quality, which involves inspecting the final product since more efficient production methods should be used. The Hazard Analysis and Critical Control Point (HACCP) system is the most effective way to ensure safety, which is based on the principle that potential threats and breaches will be detected before or during the production process to minimize risks (Craig, 2002). This system is designed specifically to eliminate risks and regulate the main parameters that affect the health of consumers. In addition to the HACCP system, sanitary and hygienic standards ensure high-quality systematic activities aimed at creating confidence that enterprises meet quality requirements. The scope of good hygiene practices includes maintaining the hygiene of premises, equipment, production personnel, training plans and medical examinations, confirming the results and monitoring of cleaning and preventive actions used to maintain hygiene (Alemanno, 2006).

Existing quality control and certification systems analyze gaps in terms of opportunities to create a comprehensive effective structure for product control and identification. Effective quality assurance methods are paid much attention to. Consumers expect the product to have an appropriate price, quality and long-term safety for their health, while food inspectors require compliance with the principles of good manufacturing practices, ensuring the safety and labelling of products, as well as compliance with the relevant standards (Vos, 2019). Therefore, using online and automatic sensors increase production capacity and

automation of processes by improving the efficiency of business activities. Thus, consumers, authorities and food producers are interested in developing new sensor systems that go beyond modern technologies. In addition, there are many new concepts of safety and identification, as well as key quality parameters that use comprehensive improved control methods aimed at encouraging consumers to follow the standards and regulations of the European Union. The term quality has taken on a new meaning over the past few decades and has become the key to achieving a competitive advantage in this industry and the path to success (Echols, 2018).

The purpose of the study is to consider the essence and features of step-by-step Food Control, to reveal modern methods of Product Identification, taking into account European Food characteristics that affect the accuracy and nature of sanitary and hygienic provisions.

METHODOLOGY

During the research, such theoretical and methodological approaches were used as actual analysis, structural and system approach, and legal bases. The actual analysis provided for a balance of responsibilities and requirements to ensure unbiased recognized standards. To achieve the goals, a wide range of facts and opinions are considered within the food industry that may threaten the protection and integrity of EU regulations with certain chaotic actions that do not meet international requirements. The difference between the legislation indicates a specific distinction between conducting industrial and entrepreneurial activities. The content of the analysis is based on long-term views and commercial interests, the range of factors of which depends on careful management and compliance with accuracy requirements. Appropriate approach guidelines are key to understanding the crucial difference between factual reporting and evidence-based analysis within the framework that references notes and Industry rights. To provide the prerequisites for a regular production process, the necessary context of professional knowledge is taken into account to develop the food industry at both the national and international levels.

The structural-system method involves a comprehensive consideration of the main issues of this industry, dealing with parametric components that draw attention to the properties of EU norms and standards and depend on the structure of interdependent variables. Their essence

is general, assuming that the parameters are independent. Therefore, this is an approach to evaluate the necessary conditions that quality systems must meet. The paradigm was applied to design systems that achieve safety and privacy characteristics while allowing us to formulate combinatorial optimization, harmonization and standardization problems that allow us to understand their certain complexity and find algorithms that are effectively deployed in the context of large-scale food production. The structural-system approach was used in the context of linear invariant enterprises, as well as other dynamic models, for which a description of problem statements is presented formed before the current state regulation and EU legislation. It helped to look at the food chain as a whole to maintain it and functionalism, which involves studying the functions of the order of certain relationships and mechanisms while maintaining a functionally integrated balance.

The current legislative acts regulating the control and identification of food products were also used as an informational legal basis, such as Law of Ukraine No. 1315-VII "On Standardization" (2014), Law of Ukraine No. 2406-III "On Confirmation of Conformity" (2001), Law of Ukraine No. 2407-III "On accreditation of conformity assessment bodies" (2001), Law of Ukraine No. 771/97-VR "On basic principles and requirements for food safety and quality" (1997), as well as Regulation of the European Parliament and the Council No. 852/2004 "On the hygiene of foodstuffs" (2004) and Codex Alimentarius (1963). Despite a significant number of scientific papers on this topic, problematic issues remain insufficiently studied, which is associated with the insufficient legislative implementation of the quality system of products and services as one of the factors for the successful functioning of entrepreneurial food activities.

RESULTS AND DISCUSSION

In the context of European integration prospects, the quality policy remains an unresolved issue of strategic Quality Management based on customer satisfaction and motivation of entrepreneurial industries to perform high-quality and efficient work. These issues require creating the necessary conditions for mandatory and gradual harmonization of national standards with international and European ones. The validity of this is confirmed by significant changes taking place within the Common Agricultural Policy of the European Union. The focus of the reforms is on the need for production

facilities to comply with European standards for nature conservation, food safety, animal health and maintaining the land in proper condition (Didora and Kluchevych, 2021), for which they will receive direct payments from the EU budget. In other words, encouraging quality is the key element of modernizing this policy, not quantity. Since improving the quality of agro-industrial products is a long-term and continuous task, the defining goal of the process was to justify the need and analyse changes in the harmonization of industrial products with EU standards and norms, followed by specifying ways to ensure their quality in the world of European and international requirements (Kryvonohova, 2021). The situation with the implementation of quality management systems at enterprises remains difficult due to the inconsistency of the current state standards and norms for products in Ukraine with international ones.

The globalization of trade makes it possible to unify the requirements for food and raw materials adopted in different countries. The requirements for any food chain at the international level are the basis of food safety requirements, covering the principles of the HACCP system. The main advantage of the component is that these standard combines and brings to a single requirement for ensuring product safety so that enterprises with different specializations within the production chain can apply the food safety management system of the current international structure, which can be certified (Basile and Gross, 2018). European quality standards become tougher and create a serious barrier in the sphere of trade relations between Ukraine and the European Union. According to international requirements, more than 8,000 standards require harmonization, and only about 1,500 are harmonized. The demand of the food industry for such standards is more than 500 units, so the pace of this process is very restrained. In the food industry, there are no technical regulations at all, while in European countries that are members of the World Trade Organization, they are legislative documents.

The main function of standards is to ensure a certain level of quality and safety of food products for consumers. In the conditions of saturation of the world market with food and food products, standards and norms are the model and standard of quality that producers should strive for to resist the expansion of more experienced competitors and players in the market

since this is largely important for the process of a country's accession to the European Union. Against the background of other industries, the situation is not the best with the adaptation of food production to international standards. So, out of 35 existing ones, only eleven meet the requirements of ISO (International Organization for Standardization). The quality is determined following the current state standard of Ukraine, where the presented data are not optimized for the standards and shelf life, technical conditions of the workpiece and methods for determining microbiological analysis. Unfortunately, not a single standard has been yet harmonized in many food groups. The vast majority of quality is determined by old standards, most of which have not been revised in the last ten years. Compliance with these regulations remains problematic for most food companies. To modify Ukrainian standards to global ones, it is necessary to provide this activity with an appropriate incentive system to improve product quality (Borchardt, 2018; Hospes and van der Meulen, 2019).

The solution to the problem of ensuring product quality is based on a set of measures laid down in order of the Cabinet of Ministers of Ukraine No. 447-R "on approval of the Concept of state policy in the field of quality

management of products, processes and services" (2002), aimed at creation and certification of a quality management system for products and the environment following the requirements of standards; comprehensive implementation of quality management systems in All Areas; Quality Management at all stages of production: from the manufacturer of raw materials to the final product; creation of food safety management systems based on the principles of HACCP and legislation aimed at encouraging these national commodity producers. The HACCP system is recognized as the most effective method of ensuring the quality and safety of food products in the world.

This is a scientifically based, rational and systematic approach to product identification, assessment and control of risks that may arise during the production, processing, storage and use of food products. It is based on 7 main principles that should be considered not as rules, but as tasks for implementing the system (Table 1). The system includes leading specialists of scientific and other institutions, enterprises and organizations, representatives of central executive authorities on health, agricultural policy, technical regulation, consumer policy and economics.

Table 1. Principles of the HACCP system.

Principle 1	Analysis of hazards that depend on food production at all stages of the life cycle.
Principle 2	Determination of critical process control points.
Principle 3	Defining critical boundaries that must be observed to ensure that the identified critical points are under control.
Principle 4	Development of a monitoring system that allows monitoring the technological process of critical control points through planned monitoring or testing.
Principle 5	Develop and apply corrective actions if the monitoring results indicate deviations from the established critical limits for each checkpoint.
Principle 6	Development of verification procedures that make it possible to verify the effectiveness of the HACCP system.
Principle 7	Documentation of procedures and registration of data necessary for the operation of the system.

Today, every company, regardless of industry, has a specific quality program that can be used for deeper and more comprehensive use of resources and capabilities. The development of industry has led to the fact that supply has exceeded demand, and this has forced manufacturers to look for new methods of attracting consumers, which have become a specific tool for achieving economic and market success (Bremmers and Wijnands, 2012). Food quality and safety are priority

issues and necessary conditions to sell goods on the market. This requirement is non-negotiable, and it is one of the most important issues of our time along with health, hygiene, and nutritional value. To get a high-quality final product, it is necessary to take care of its products throughout the entire food chain, from suppliers to consumers. Food safety is widely recognized as extremely important. Attention to quality should be applied throughout the business system to prevent and

correct violations on time. Food quality issues complicate it as a product, which is determined by many factors that relate to different areas. To guarantee the quality, it is necessary to follow the rules of the accepted Quality Assurance System and, above all, be aware of their role, with a proper sense of responsibility and knowledge of the person involved in the full production, processing and protection of raw materials (Povel and van der Meulen, 2007; van der Meulen and Freriks, 2021).

The national requirements and those of the European Union are the basis of legal norms related to food quality and safety. They define the scope of activities of the agro-industrial and food sectors, from plant cultivation and animal husbandry to processing, packaging and distribution of products, covering an integrated food chain (Mykytyuk, 2021). The food quality system becomes the benchmark of the standard and a clear rule that determines the value of the final product, the availability and the price that consumers can pay. Quality is a biased concept, the interpretation of which depends on individual assessments of the product in terms of its perfection, that is, taste, colour, texture, nutritional value and ease of preparation for consumption. Strict requirements and restrictions arising from legislative norms and market mechanisms lead to active progress through continuous improvement of the quality and safety of business activities. The role of official control bodies is very important to ensure the proper functioning of the relevant system structure. The control units implemented by food legislation are based on verifying the proper functioning and implementation of competent risk management. Official agencies participate in the early warning system for the sale of hazardous food products.

Codex Alimentarius (1963) is a code of unified international food standards developed under the guidance of the Food and Agriculture Organization of the United Nations (FAO)/World Health Organization (WHO), intending to protect consumer health and ensure fair trade practices. Its creation was due to the intensification and globalization of modern food production and interstate trade relations, as well as the need to introduce more stringent requirements for food safety. This code contains the main provisions on the hygiene of food products, food additives, pesticide residues, labelling and presentation of products,

methods of analysis and selection, provisions of a recommendatory nature that the international community must adhere to protect consumer health and ensure uniform trade production methods (Anker and Grossman, 2009). Currently, its Commission is an influential intergovernmental body that operates based on Law of Ukraine No. 771/97-VR "On basic principles and requirements for food safety and quality" (1997) and Resolution of the Cabinet of Ministers of Ukraine No. 903 "Issues of the National Commission of Ukraine on the Alimentarius Code" (2006), which includes more than 170 member states. Its main tasks are to promote the introduction of new technologies, international standards, domestic technical regulations and international sanitary measures in the field of food production, as well as new methods of their research.

Currently, Regulation No 852/2004 of the European Parliament and the Council "On the hygiene of foodstuffs" (2004), which sets requirements for members of the European Union regarding the HACCP system. Its principles ensure food safety, which is a priority in the global agricultural policy, and in general, more than 20 similar directives have been issued. The directions of their action are laid down in the Council Resolution "On a new approach to technical harmonization and standards" (1985), adopted by the EU Commission to eliminate technical trade barriers. In recent years, most EU member states have been actively developing a national quality policy as a condition of superiority in international competition, where the emphasis is placed on creating an environment in which European producers will strive for the highest quality, and not just to meet the requirements of mandatory regulatory documents. The European Quality Promotion Policy is based on the need for widespread implementation of ISO series standards, both for international companies and countries that prepare to trade on the world market. However, an analysis of the geographical distribution of ISO certificates of this series in Ukraine shows that there is no link between the number of certified national industrial enterprises and the competitiveness of food products (Will and Guenther, 2019; Shaw, 2020).

The implementation of food quality policies implies a difference in food products originating from certain regions and characterized by a traditional way of production. The most important feature of regional and traditional products is manifested in the specific quality,

which can be the result of the environment – the influence of natural factors characteristic of a given area, for example, location, topography, climate, vegetation. Regional and traditional food products are of cultural value and are considered a unique benefit of the regional product protection system. In this system, food products are characterized by individual characteristics for the region in which the product is produced, or the method of its production, which is influenced by customs and heritage. Following the policy, manufacturers of such specialties have the right to designate them with appropriate signs, that is, protected products. In the European Union, the names of such food products are registered and marked by the group of manufacturers. European Registration at the level entitles manufacturers who produce products following the specification to use labelling, and the method of production is subject to registration and is determined by specific specification conditions to allow the use of a protected name.

Manufacturers are required to ensure their specific and consistent quality. Any representative of this activity who wants to produce a product under a registered name must pass additional verification by the business process with a specific specification. The registered product mustn't become the exclusive property of specific manufacturers, since no one can assign a specific property due to different conditions in a particular area or regulations. The general standard defines minimum requirements for quality and maturity without classification, and its purpose is to ensure that food products released to the market are sufficiently developed and have a commercial appearance. It requires detailed requirements for provisions on the size, tolerance limit, presentation and labelling of individual products by the country of origin of a given product on the packaging. There are certain exceptional situations where products supplied by the manufacturer are exempt from meeting the requirements of the content standards, which provide for additional applications equivalent to the processing industry or other non-food purposes. If production is subject to the general rules of commercial standards, then all product quality parameters ensure their repeatability (Scott, 2018). They represent the relationship between consistent actions and protection from the consequences of adverse events in the food chain. Product Safety is the starting point in the light of current legislation.

In Ukraine, the food safety control system is distributed among several institutions competent in the selected industry. Together, these institutions provide oversight of all food quality and identification issues. Individual inspections established to control products have limited competence over the selected mechanisms of the global food chain. Trade inspection bodies take measures aimed at eliminating food product counterfeiting. The disparity between different institutions calls for close coordination of processes, especially in critical situations that require immediate action. Recent food analyses show that the more complex a food product is or the longer it takes to travel from producer to consumer, the greater the risk of stopping its production in industrial mass production. This supervision does not include checking agricultural products from producers. However, entrepreneurs grow into the highest standards that determine their place in the market. They need to build trust in contractors and then take care not to lose it. As practice shows, it is sometimes necessary to prove diligence by rationally planned and targeted monitoring of compliance with food legislation throughout the supply chain (Bronckers and Soopremanien, 2008; Marielle, 2019).

The rules contribute to improving food transparency, combating fraud and restoring consumer confidence by introducing effective food inspection processes at various stages of the journey from producer to consumer, adopted during the vote in the European Parliament. They should guarantee high standards of food products entering the European Union Market by strengthening controls at various stages of production, processing and distribution. The new standards should ensure the emergence of a complete, integrated and more effective control system in the field of product and feed safety, veterinary requirements, as well as control of organic production and principles of geographical labelling of products. Thus, the changes will provide a comprehensive and productive control system at every stage of the food chain and improve the well-being of the general population. Audits should be conducted without warning, taking into account the risks for all sectors of activity, which in turn should ensure more effective measures to combat counterfeiting and fraud, rules for labelling and organic food production, rules for importing animals and other products from third countries, coordination and stricter penalties in case of violations or falsifications.

EU food quality and safety standards are among the most restrictive in the world. However, the globalization of the food market and the distribution of food products increase the risk of international fraud. Hence, the need to improve the quality of control carried out to ensure the highest level of protection of human health and animal and plant welfare. Permanent amendments to the legislation are aimed at improving the determination of the authorities to protect consumers and honest suppliers from violators. The results of large-scale studies have shown that the practice applies to the markets of many European countries (Marsha, 2018). Consumer expectations relate to food safety requirements because of trust, naturalness, and fairness. Knowledge about food products should build trust – that is what consumers expect. Joint agricultural policies and food legislation reforms contribute to the transparent harmonization of this law at all levels. An indisputable issue that is of great importance in a food enterprise is the properties of tracking a particular product, not only from the point of view of safety or consumer expectations but also the achievement of preferences, origin and information about the product, which in the long run leads to the formation of loyalty.

The basis for reforming the technical regulation system in Ukraine is the law of Ukraine No. 1315-VII “On standardization” (2014), Law of Ukraine No. 2406-III “On confirmation of conformity” (2001), Law of Ukraine No. 2407-III “On accreditation of conformity assessment bodies” (2001) and Law of Ukraine No. 771/97-VR” on basic principles and requirements for food safety and quality ” (1997), which provides for a radical change in the outdated current system of technical regulation, which until now existed in a degraded version and significantly differed from world practice. The basic regulatory legal acts in the field of technical regulation should be technical regulations. A fundamental provision of Law of Ukraine No. 771/97-VR “On basic principles and requirements for food safety and quality” (1997) is the introduction in the country of a system similar to the European Union of risk analysis and control of their regulation at critical points of the HACCP system. The legislation of Ukraine obliges food enterprises and production facilities of the agro-industrial complex to carry out a phased implementation of the international management system. However, due to insufficient funding, outdated technologies and the lack of scientifically based rules of behaviour of personnel of

enterprises that produce food products, this system is being implemented rather slowly. Now, only 6 food industry enterprises have mastered modern international methods and are actively implementing the European system of safe products (Szajkowska, 2012). The European Union Market is not sealed, and its safety is a cross-border task to prevent the transfer of various kinds of low-quality food products to consumers. Countries introduce legal norms related to the production and marketing of food products, including standardization, which introduces the obligation to apply a quality management system. Mandatory components of standardization are good hygiene and manufacturing practices, an appropriate system for analyzing hazards and critical control points. They cover the production method performed by a particular individual manufacturer or group of producers. To pass the standardization process, you should choose the appropriate body that conducts this process, checking business activities in the field of food product sales. The implementation of good practice principles together with system standards ensures organizational changes and brings tangible benefits to manufacturers, guaranteeing the export of products at a higher price, which is the main condition for signing commercial contracts. In a changing market situation, it is important to monitor the state of adaptation of enterprises to the operating conditions and competitive entry into the European market (van der Meulen, 2018; Broberg, 2020).

CONCLUSIONS

To prevent negative consequences in the absence of a clear program of actions to harmonize the quality and safety standards of products to European, as well as to create conditions for the implementation of the action plan for Ukraine's entry into the food market of the European Union in this aspect, it is necessary: to speed up the process of optimizing national regulatory legal acts with confirmation of compliance with European and international standards; to develop and implement technical regulations for agricultural and food products, which in the member countries of the World Trade Organization are a legislative document, in accordance with the requirements of the International Organization for Standardization; to form an effective system for supporting innovation in agro-industrial enterprises and complexes, in particular in the development of new and

improve existing resource, energy-saving and environmentally friendly technologies; develop a methodological system for determining the quality and safety indicators of food products, agricultural raw materials, food impurities that are produced in the country or imported from abroad with appropriate security for its financing; introduce a system of environmental monitoring of agricultural products; introduce at the state level the practice of providing interest-free loans to enterprises that introduce international quality management systems; improve and develop a network of educational institutions for training specialists in the field of standardization, certification and accreditation of the technical regulation system in Ukraine. It is proposed to develop a control plan similar to those intended for EU member states. They should be developed based on guidelines that should form the basis for further monitoring by the European side. As a result, it will be possible to simplify the existing control regime, expand effective cooperation and facilitate trade flows. The purpose of introducing a special control procedure for these products is that in this area it is necessary to ensure compliance with special sanitary rules and realize the need to harmonize product control procedures in the territory of the European Union. Acceptable limits on residual amounts in food products should be established to facilitate the achievement of uniformity of procedures and sanctions at all border points.

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