

INSTITUTIONAL NEEDS TO OVERCOME FOOD SECURITY CHALLENGES IN UKRAINE IN EMERGENCY CONDITIONS

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The problem of food security is extremely important for Ukraine and the world, especially in conditions of crises and emergencies. The authors studied the problems of overcoming the challenges of food security in the extraordinary conditions of Russian aggression in Ukraine. The purpose of the study is to improve approaches to assessing food security and to identify institutional needs for overcoming food security challenges in the context of the war in Ukraine. Ukraine is the guarantor of world food security and provided almost 6% of the caloric content of world consumption. The study assesses Ukraine's place in the global food security index. It analyzes the main legislation in the field of food security, emphasizes the need to adopt a strategy and other legislative acts in this area, clarifies the state of implementation of the Ukraine - European Union Association Agreement. Taking into account the developments of the Food and Agriculture Organization of the United Nations, the authors systematized and improved the system of food security indicators by building a functional scheme-model. It includes five main blocks - the level and quality of nutrition, physical availability of food, economic availability of food, food independence and market stability. The authors emphasize the importance of taking into account the ecology, natural resources and the state of the institutional environment. The study reveals the food security situation for each block and offers tools for its solution. It defines measures to increase food security and a list of indicative indicators that characterize its level.

Keywords: food security, food independence, physical availability, economic availability

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Introduction

Food security is important for global processes of sustainable development and economic growth of the world countries. Russian federation's military aggression against Ukraine caused an economic, food and humanitarian crisis in Ukraine, negatively affected the state of food security not only in the country but also in the world. Ukraine for a long period of time was a world leader in the supply of food to foreign markets. According to the United Nations World Food Programme (WFP), Ukraine provided almost 6% of the caloric content of world consumption. In 2021, Ukraine's share in world food exports of cereals was 8%, including wheat – 8.9%, corn - 11.4%. The share of exports of value-added products, in particular oil and chicken, was also large. After Russia launched a full-scale war in 2022 supply volumes decreased: the share in global exports reduced to 5.1%, including wheat – to 3.3%, corn – to 9.5% (Trade Map, 2023). The state of food security in Ukraine during the period of hostilities has deteriorated significantly, so identifying means to overcome food security

challenges, improving approaches to its monitoring will contribute to improving the food supply of the population and overcoming negative phenomena.

The problems of food security were studied in the scientific works of many scientists. Lee S., Barrett C.B., Hoddinott J.F. examined the dynamics of food security in the United States for 2001-2017 (Lee et al., 2023). They applied the indicator of the probability of food security (PFS), which estimates the likelihood that food costs equate to or exceed the cost of a healthy diet. During the studied period, two-thirds of households did not experience food insecurity. However, households headed by women or insufficiently educated people experienced insufficient food.

Nour S.S.O.M., Abdalla E.M. assessed the determinants of food security in Sudan and the institutional environment on the example of Kassala state (Nour, Abdalla, 2021) and proved that family production significantly affects household food insecurity, especially under conditions of insufficient food security. The researchers substantiated the importance of increasing own family production and household incomes.

In their work, Focker M., van Asselt E.D., Berendsen B.J.A., van de Schans M.G.M., van Leeuwen S.P.J. (Focker et al., 2022) noted that European food production systems have become very efficient in terms of high yield, quality and safety. However, due to the loss of crops, they are not sustainable enough, so at the stages of the production chain it is necessary to establish the principles of the circular economy and additionally identify threats to food safety.

Zhou Y.H., Mujumdar A.S., Vidyarthi S.K., Zielinska M., Liu H.L., Deng L.Z., Xiao H.W. (Zhou et al., 2023) found that food safety and food security are of great concern worldwide. However, nanotechnology will provide great opportunities for increasing the safety of food products and increasing the productivity of agriculture in an environmentally friendly way.

In their study, Rey J.M.M., Carpio M.L.O., Cousinou G.M. (Rey et al., 2021) substantiated that in the debate on the global problem of hunger in recent years, three main conceptual approaches interact: food security, food sovereignty and the right to food, which cover technical and legal aspects and are aimed at solving the problem of hunger. Therefore, it is important to distinguish between these approaches and establish differences and common features between them.

Relevant from the point of view of the social component is the study on the elderly and the food security infrastructure of Balistreri K.S. (Balistreri, 2022). The researcher proved that the availability of support programs for the population - The Supplemental Nutrition Assistance Program (SNAP), Senior Farmers Market Nutrition Program (SFMNP) and The Commodity Supplemental Food Program (CSFP) improve food security for low-income households headed by seniors over the age of 60. The option of home delivery of food and support for elderly farmers is also important.

Economic, technical, regulatory and legal aspects of food safety in emergency situations were systematized by Kovalenko O., Yashchenko L., Verbytskyi S., Patsera N., (Kovalenko et al., 2023), Boki O. (Boki, 2022). Scientists came to the conclusion that it is necessary to apply an integrated approach to these areas and the importance of taking into account the requirements for food safety in regulatory documents.

The work of Sychevsky M. (Sychevskyi, 2019) examines the issues of global food security and Ukraine's place in its achievement, as well as the problems of the economy of the food industry as the basis for food security and state development. The author analyzed the rating of countries by the level of food security GSFI (Global Food Security Index). As the rating shows, Ukraine, having a high agricultural potential, lags behind neighboring countries – Poland, Hungary, Romania, Belarus. Gross domestic product (GDP) per person is an indicator of individual income and food availability.

The researcher noted that similar in content indicators of the GSFI index and indicators of the Methodology approved by the Cabinet of Ministers of Ukraine may differ significantly. As an indicator of food security, the GSFI index also considers the import duty on agricultural products, which is calculated as an average tariff for all agricultural imports of the country and demonstrates the degree of freedom of the market.

Kovalenko O., Kuts O. and Boky O. (Kovalenko, et al., 2020) focus on the conceptual principles of economic policy and mechanisms for the development of the food industry, which should primarily be aimed at achieving food security of the country, and the methodological approaches of the authors are aimed at structuring spheres of influence to achieve the goals.

The work of Pruntseva H. is devoted to methodological approaches to assessing the country's food security (Pruntseva, 2020). Among the main elements of the mechanism for assessing food security, the author identifies the identification of the needs of the population for food security, which must be taken into account when assessing food security. Pruntseva H. notes that modern economic policy does not always take into account the limited possibilities of the environment. Kovalenko O. (Kovalenko, 2015) considers food security in the system of priorities of innovative development and substantiates that the state should rely on methodological foundations, calculation and prevention of future risks, definition of development scenarios in conditions of crises.

Babich M. (Babich, 2018), analyzing currently used indicators of food security, emphasizes their interrelationship, offers recommendations for strengthening food security. Thus, the problem of finding relevant approaches to the assessment of food security, taking into account world trends, is timely and relevant.

The purpose of the study is to improve approaches to assessing food security and to identify institutional needs for overcoming food security challenges in the context of the war in Ukraine.

Materials and Methods

The scientific basis of the study was dialectical methods of knowledge, positions, principles and methods of modern economic theory. The statistical method was used to process the data of official statistics and identify trends, in particular, regarding the share of grain crops of Ukraine in world exports, the dynamic method – to compare indicators in dynamics, in particular, to compare the place of Ukraine according to the rating of Global Food Security Index by year, methods of systematic generalization and comparison – to assess changes in the state of food security. The information base of the research was the data of the State Statistics Service of Ukraine, Food and Agriculture Organization (FAO), Trade Map, United Nations, current legislation.

Results and Discussion

According to FAO in 2020, 690 million people (8.9% of the world's population) suffer from hunger on planet Earth. Over the past five years, the number of hungry people has increased by 60 million people, and over the year – by 10 million. 2 billion people on Earth are deprived of constant access to safe and nutritious food, and 750 million people experience an acute lack of food - almost every tenth inhabitant of the planet (FAO, IFAD, UNICEF, WFP, WHO, 2020). In Ukraine, as in the world, food security was complicated during the COVID-19 pandemic, when a state of emergency was declared in the country and in certain regions, employment and income levels of citizens decreased due to quarantine measures. The self-employed part of the population lost almost all its income during the quarantine. The pandemic has affected basic aspects of food security: availability,

access, use, stability (Zurayk, 2020). The problem of food security is aggravated by hostilities in Ukraine, which complicates access to food for the population. As a result of the conflict, the threat to physical security increased, access to food and medicine became more difficult. Therefore, the problem of ensuring food security is one of the most fundamental on a global scale, since a sufficient amount of food and the possibility of acquiring it at any time determines the conditions of human life.

Due to the increase in food prices caused by the military aggression of the Russian Federation, the availability of food products for the population in the regions of Ukraine decreased by 15 - 43% (Kyiv School of Economics, 2022). According to the United Nations (UN), every fifth family experiences a lack of food, and in front-line settlements more than 80% of the population lacks a permanent food supply. About 2.4 million people receive monthly support in the form of cash payments and food packages (Information agency "Ukrainian National News", 2023). The results of a survey conducted by FAO experts among 5,200 business entities showed that 25% of agricultural producers stopped or significantly reduced the production of agricultural products (Mykhalchuk, 2022). According to the WFP survey, every third household in Ukraine in 2021 was at risk of food insecurity. Among displaced or separated families, every second family was at risk of food security. A third of households did not have a source of basic income or depended on outside help, 42% expressed concern that they might not have enough food in the coming week (World Food Programme, 2022).

Annual ratings of countries according to the Global Food Security Index (GFSI), which are based on the analysis of integral indicators through international comparisons, focus on assessing the following criteria: physical and economic accessibility to food; its availability, quality and safety; state of natural resources; stability of food supply in the region. The index integrates a dynamic quantitative-qualitative model based on indicators of food security in the world countries. If in 2020 and 2021 Ukraine took 54th and 58th places respectively, then in 2022, due to military aggression, it took 71th place out of 113 countries and last place out of 26 European countries. The best result was in terms of quality and food safety - 52nd place in the global ranking. Low indicators had segments of social and logistics support, which limited access to food and caused its insufficient diversity (Global Food Security Index 2022 report, 2022).

The main strategic directions of ensuring food security in Ukraine are defined in the National Economic Strategy of Ukraine until 2030 (Decree of the CMU "On the approval of the National Economic Strategy for the period until 2030". No. 179, 2021 March). The assessment of the state of food safety is carried out by the method of determining the main indicators (Decree of the CMU "Some issues of food safety". No. 1379, 2007 December). The draft of the Food Security Strategy of Ukraine until 2030, which has not been adopted to this day, provides for the improvement of current legal acts and programs, ensuring their effective implementation, annual monitoring of the results of the strategy implementation, conducting regular research taking into account the specified indicators and criteria of food security. Monitoring of the implementation of the Strategy is supposed to be carried out by collecting, processing, systematizing and analyzing indicators and criteria of food security, identifying and assessment of changes that need to be monitored to prevent and eliminate the consequences of negative processes and threats to food security (Ministry of Economy of Ukraine, 2020). Legislation on ensuring food security under martial law is currently in force, but it is extremely important to adopt the Strategy and laws on food security, taking into account modern challenges, as well as a modernized methodology for evaluating its main indicators.

Changing trends in the world, new risks and challenges facing countries, as well as new opportunities, the intensification of globalization processes and the integration of post-Soviet countries into the European Union have set new tasks for scientists. Approaches to assessing food security were formed and changed at each stage of transformational changes in the development of society. At the initial stage, transitional stocks of grain crops were estimated as indicators of food security (the indicator of sufficiency was at the level of 20%, then 16% of annual consumption), as well as the level of income of the population.

A comparison of food security indicators practiced at United Nations Industrial Development Organization (UNIDO) and FAO showed their insignificant difference. They cover indicators of physical, economic availability, use of water resources, inferiority of nutrition, vulnerability (stability). FAO, in comparison with the United States, expands the list of indicators due to important indicators of deficiency and the level of prevalence of food insufficiency. An important indicator is the index of volatility of domestic prices for food products, which characterizes the instability of the market.

Currently, in Ukraine, the main indicators for assessing food security are the indicators presented in the "Methodology for Determining the Main Indicators of Food Security," approved by Resolution of the Cabinet of Ministers of Ukraine No. 1379 of 5.12.2007: 1) daily energy value; 2) provision of the food ration with basic food products, as a ratio between actual consumption and rational norm; 3) grain sufficiency in state reserves; 4) economic availability (the share of food costs in total population costs); 5) differentiation of the cost of nutrition of the higher and lower quintile groups; 6) the capacity of the domestic consumption market; 7) food independence (ratio of import volume to domestic market capacity). Reports on food security were published on the information resource of the Ministry of Economy of the Ukraine, and from 2016 to 2022 - on the website of the non-governmental organization "Economic Discussion Club," which united experts in the field of economics, former government officials (Decree of the CMU "Some issues of food safety". No. 1379, 2007 December).

The research was provided in the format of an express assessment of the main food security indicators of Ukraine for the year. At the same time, the estimated indicators practiced at the FAO level (world ratings in the field of food security, road density, quotas for imports of raw materials, etc.) were given less attention.

According to FAO forecasts, if current nutrition models continue until 2030, then the level of global annual health spending related to mortality and non-communicable diseases will reach 13 trillion US dollars, and annual GDP losses will be 5% (FAO, 2023).

Until 2015, FAO's annual reports on food security were entitled "The State of Food Insecurity in the World". In 2015, the report focused on measures to protect against slowing economic growth. The key factors of success were identified as economic growth, market development, international trade, social protection.

The adoption of the Sustainable Development Goals in 2015 contributed to the expansion of food security indicators in Europe and the world. Among them, indicators of the prevalence of malnutrition and lack of food security, as well as the level of food security, can be highlighted.

Protracted crises and natural disasters have a detrimental effect on reducing of hunger. After the adoption of the Sustainable Development Goals by 2030, which replaced the Millennium Development Goals, FAO's annual reports have already been positioned as "The State of Food Security" and have focused on improving resilience to external and climate impacts (2017-2018),

measures to protect against economic slowdown and economic downturns (2019). In 2020, the emphasis is on healthy eating - an actual trend of modernity in the context of the deterioration of the environmental situation in the world (FAO, 2023).

Taking into account the positions of FAO, whose activities are primarily aimed at ensuring food security in the world, the selection and monitoring of food security indicators should reflect the current state and dynamics of the food supply level, their compliance with regulatory values.

Summarizing the approaches to assessing food security in Ukraine and in the world, food security indicators should be classified into groups (blocks): level and quality of nutrition, physical and economic availability of food, food independence and market stability. To fully assess the state of food security, it is important to include ecology and natural resources issues, as well as the state of the institutional environment (Figure 1).

Level and quality of nutrition (block I) are ensured by the daily caloric content of the diet and the sufficiency of consumption in accordance with the recommended norms. Food insecurity among other things takes the form of insufficient or unbalanced calorie intake, which can lead to weight loss or obesity, various diseases. In particular, the daily caloric intake of Ukrainians in 2021 was 2,799 kcal per person, which slightly exceeds the threshold limit of 2,500 kcal (Figure 2). Therefore, it is very important to inform, promote and implement healthy eating measures from childhood and throughout life.

To achieve the proper level of nutrition in a stable environment, it is necessary to compare the food needs of the population with the available food resources by forming and tracking regional food balances. In the context of a full-scale invasion of the Russian Federation, consumer preferences of the population shifted towards cheaper products, increased consumption of long-term storage products. Due to the limited possibilities of purchasing food products by residents of the front-line regions and combat zones, the quality of their food has deteriorated the most.

To solve the problems of food quality, it is necessary to improve the current norms and standards, the current legislation, the system of quality control and traceability of food products in each section of the food chain. On the way to the association of Ukraine with the European Union, since 2015 Ukraine has been adapting current legislation and regulatory acts to European standards, which has a positive impact on the level of food quality.

The progress of implementation of the Ukraine-European Union Association Agreement in the field of agriculture, the main supplier of raw materials for food industry, reached 70% (for comparison in the field of taxation and energy - 79 and 78%) (Pulse of the Agreement, 2023). In the field of agriculture, it is necessary to adapt crop trade standards, approve rules for checking the quality of livestock products on the ground. It is necessary to complete the harmonization of legislation on transport and infrastructure, which provides food logistics, since now it is harmonized by only 56%. Improved regulatory and legal support, current standards and regulations will create the basis for the effective functioning of production-sales chains and achieving food security.

Physical availability of food is essential for food security (block II). Food supply is formed by domestic production and imports of products. When supplying products, it is necessary to take into account the level of urbanization of the area and the density of settlements. The physical availability of food means the ability to get to food products without hindrance and in a short time, which is complicated by martial law and numerous air alarms in Ukraine.

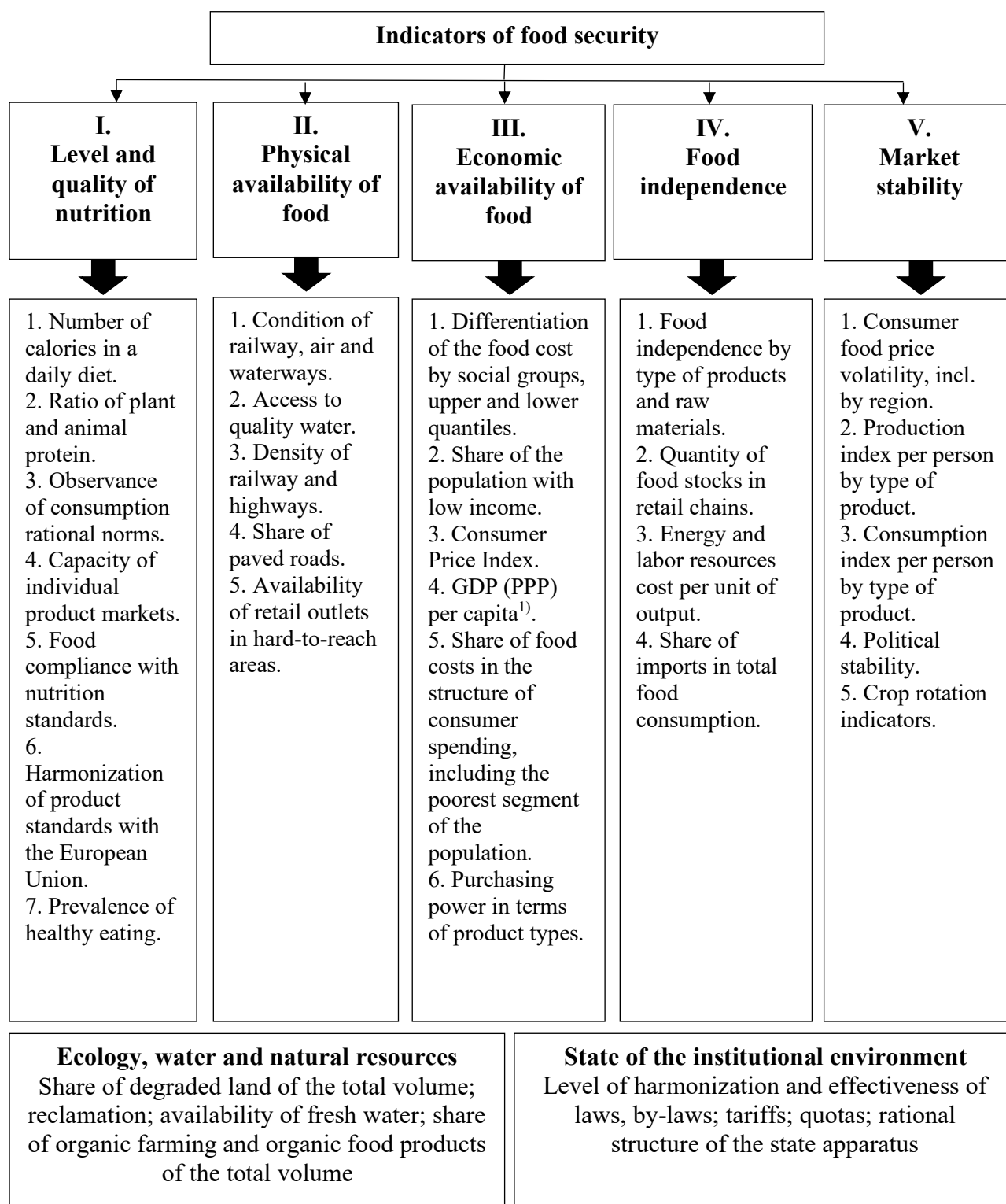


Figure 1. System of food security assessment indicators

Source: compiled by the authors taking into account the developments of FAO and the Ministry of Economy of Ukraine

¹⁾ GDP (PPP) per capita – gross domestic product at purchasing power parity per capita; it shows the market value of goods and services

In war conditions, the food problem was caused by internal and external migration, which worsened the indicators of physical availability of food and sufficiency of consumption, as well as price availability. As of 2023, 8.18 million citizens of Ukraine (20% of the pre-war population) migrated abroad.

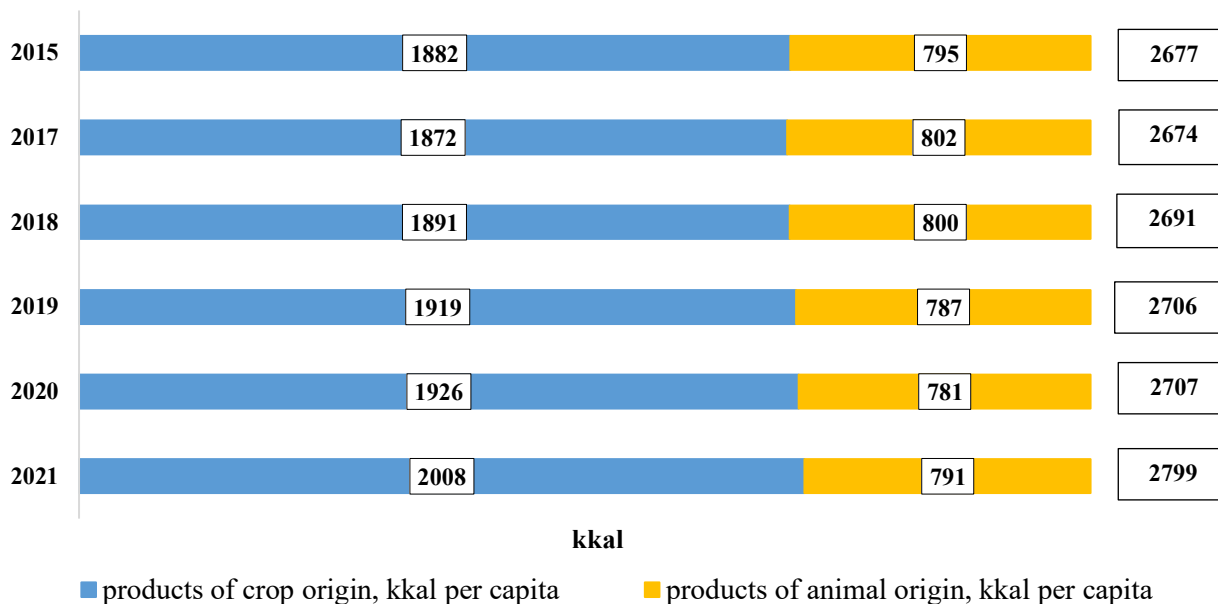


Figure 2. The number of calories in the daily diet of a Ukrainian

Source: formed by the authors based on the data (State Statistics Service of Ukraine, 2024)

According to the report of the International Organization for Migration "Ukraine Internal Displacement Report" at the end of September 2023 3.7 million internally displaced persons were registered in Ukraine, of which 52% are concentrated in 5 regions of Ukraine (IOM UN migration, 2023). The greatest burden fell on the western regions of Ukraine, as well as Kyiv and Odessa regions.

Sustainable food supply systems should be based on short supply chains from producers to consumers, that is, by developing food chains in local communities, which, at the same time, will provide increased employment. The implementation of this measure requires the development of support programs for local communities and their populations. An effective example of such assistance can be the food program "Gardens of Victory," which was launched in the pre-war period and is currently being successfully developed (Ukrinform, 2022). The program is aimed at supporting the self-sufficiency of the population with locally produced products in the regions of Ukraine. Program experts provide advisory assistance to local communities, assess their need for food products and supply volumes in local markets.

In the conditions of military aggression, mobile sales locations of food products, which supply consumers with essential goods, in particular bakery, meat and dairy products, are becoming increasingly important. The extraordinary challenges of recent times (pandemic and military aggression of the Russian Federation) have led to a reduction in the distances of food supply chains.

An effective factor and indicator of food security is the *economic availability of food* (block III), that is, the economic opportunity to purchase a certain set of products necessary to ensure normal human life. Economic availability is based on the ratio of incomes and expenses of the population to

the level of food prices. It is necessary to strengthen the support of low-income sections of the population, to contribute to poverty alleviation and economic growth.

Food independence (block IV) implies independence from the external supply of raw materials and products, a small share of imports in food consumption. Indicators of food independence have become relevant during a global pandemic, wars and local conflicts. One of the main indicators – food independence by type of product, which characterizes the share of imports in the total volume of food consumption. Ukraine has a low import dependence on socially important types of food - milk, meat and grain processing products. The share of retail sales of food produced in Ukraine is shown in Figure 3.

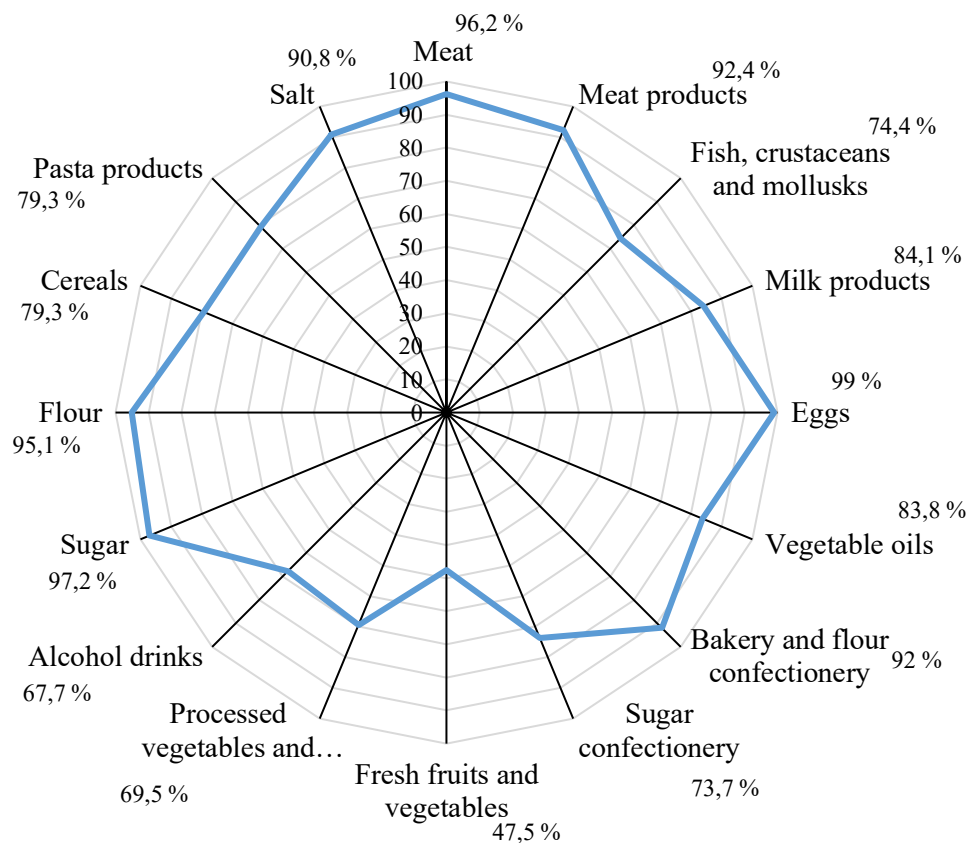


Figure 3. The share of retail sales of food produced in Ukraine in 2021, %

Source: formed by the authors based on the data (State Statistics Service of Ukraine, 2024)

Market stability (block V) implies the existence and functioning of uninterrupted food supply chains that can not be influenced by negative factors, risks and challenges, without violating these chains and the basics of food security. Stability is largely ensured by a stable institutional environment, balanced state agrarian policy, correct strategic guidelines. According to a combination of factors, market stability is ensured by stable food systems, which should move from sufficient food supply to diversifying the diet and healthy nutrition. Sustainable food systems, as defined by FAO, should ensure food security and not expose future generations to economic, environmental and social risks (FAO, 2017). Stability is ensured by low volatility of consumer prices, stable production and

consumption of food products, political balance, absence of wars and conflicts, sustainable development of agriculture.

As a result of the military aggression of the Russian Federation, the stability of the market economy in Ukraine was violated – the political, economic and humanitarian situation was destabilized, which led to a deterioration in the food supply of the population.

Thus, in order to increase the level of food security in the face of emergency challenges, it is necessary to improve the tools for its assessment, regulation and control, in particular, the methodology for determining indicators, and the regulatory and legislative framework for creating a favorable institutional environment.

Conclusions

To ensure monitoring of the main food security indicators, the authors proposed an improved system of indicators, taking into account FAO's approaches and current challenges in Ukraine. It includes 5 main groups of criteria that should take into account the ecology, natural resources and the state of the institutional environment, namely: 1) the level and quality of nutrition – it is necessary to improve the stimulation and informing of consumers, the provision of preferences to producers of healthy nutrition, the saturation of the market with food products; 2) economic availability of food – achieving parity of prices for food products, reducing its cost, increasing living standards and purchasing power of the population; 3) physical availability of food – improvement of infrastructure, stable provision of food supplies to hard-to-reach areas; 4) food independence – increasing the level of import substitution, expanding domestic production, improving logistics; 5) market stability – improvement of the macroeconomic situation, modernization of domestic production facilities and attracting investments.

Conflict of interest

The authors state no conflict of interest.

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