

Шабатура Тетяна Сергіївна,
доктор економічних наук, професор кафедри економічної теорії та економіки підприємства Одеського державного аграрного університету

Галицький Олександр Миколайович,
доктор економічних наук, професор кафедри економічної теорії та економіки підприємства Одеського державного аграрного університету

Глушков Олег Анатолійович,
кандидат технічних наук, доцент, директор Відокремленого структурного підрозділу "Фаховий коледж нафтогазових технологій, інженерії та інфраструктури сервісу Одеського національного технологічного університету" Одеса, Україна

Shabatura Tetiana,
Doctor of economic sciences, Professor, Department of Economic Theory and Enterprise Economics Odessa State Agrarian University, Odessa Ukraine, <https://orcid.org/0000-0002-7107-0167>

Halytskyi Oleksandr,
Doctor of economic sciences, Professor, Department of Economic Theory and Enterprise Economics Odessa State Agrarian University, Odessa Ukraine, <https://orcid.org/0000-0001-9549-7627>

Glushkov Oleg,
PhD (Candidate of technical sciences), Associate Professor, Director of Separated Structural Subdivision "Professional College of Oil and Gas Technologies, Engineering and Service Infrastructure of Odesa National University of Technology" Odesa, Ukraine, <https://orcid.org/0000-0001-6423-2239>

ПРОДОВОЛЬЧА БЕЗПЕКА В УКРАЇНІ: МОЖЛИВОСТІ ТА РЕАЛЬНІСТЬ FOOD SECURITY IN UKRAINE: OPPORTUNITIES AND REALITY

Шабатура Т. С., Галицький О. М., Глушков О. А.
Продовольча безпека в Україні: можливості та реальність. *Український журнал прикладної економіки та техніки*. 2024. Том 9. № 1. С. 266 –271.

Shabatura T., Halytskyi O., Glushkov O. Food security in Ukraine: opportunities and reality. *Ukrainian Journal of Applied Economics and Technology*. 2024. Volume 9. № 1, pp. 266 –271.

У статті обґрунтовані актуальність дослідження сучасного стану забезпечення продовольчої безпеки в умовах воєнного стану, його проблеми та перспективи. Визначено, що дієва система продовольчої безпеки країни має забезпечувати населення необхідним продовольством, яке базується на національному агропромисловому комплексі. Продовольча безпека держави є важливою складовою частиною загальної економічної безпеки, яка також є частиною суспільної безпеки країни. Виділені показники, за якими можна оцінити ступінь продовольчої безпеки держави. Авторами встановлено, що сучасні дослідження забезпечення продовольчої безпеки обмежуються проблемами її забезпечення в умовах пандемії коронавірусу, а тому сучасна ситуація потребує подальших наукових напрацювань. Визначено умови та заходи щодо забезпечення продовольчої безпеки нашої держави. В ході дослідження відзначено, що сучасні національна та глобальна системи забезпечення продовольчої безпеки дуже вразливі до впливу кризових ситуацій: збройних конфліктів, свідомого блокування поставок сільськогосподарської продукції на зовнішні ринки з боку країни-агресора, зростання світових цін та неврожайів. Крім того, відзначено, що продовольство також може стати підставою для шантажу світової спільноти з боку агресора. У роботі проведено аналіз втрат, нанесених сільськогосподарській галузі в результаті повномасштабного російського вторгнення та їх наслідки для України і країн світу. З'ясовано, що Урядом України з метою забезпечення національної продовольчої безпеки підготовлено план заходів щодо забезпечення продовольчої безпеки в умовах воєнного стану та створено Національну платформу продовольчої безпеки.

Проведене дослідження дає підстави стверджувати, що незважаючи на військову агресію з боку російської федерації, значні втрати матеріальних, економічних та трудових ресурсів Україна спроможна забезпечити власну продовольчу безпеку та залишається важливим експортером для продовольчої безпеки багатьох країн. Визначено також необхідність спільних згаданих зусиль світової спільноти для протидії агресору з метою забезпечення продовольчої безпеки на національному та глобальному рівнях.

Ключові слова: продовольча безпека, економіка, виробнича система, сільськогосподарська продукція, експорт, імпорт, ризики, воєнний стан.

The article substantiates the relevance of the study of the current state of ensuring food security under martial law and its problems and prospects. It is determined that an adequate food security system in the country should provide the population with the necessary food based on the national agro-industrial complex. The state's food security is an essential component of the overall economic security, which is also part of the country's public security. The indicators by which it is possible to assess the state's food security degree are allocated. The authors found that modern research on food security is limited to the problems of its provision in the context of the coronavirus pandemic. Therefore, the current situation requires further scientific development. The conditions and measures to ensure the food security of our state are determined. During the study, it was noted that modern national and global food security systems are very vulnerable to the impact of crises: armed conflicts, deliberate blocking of the supply of agricultural products to foreign markets by the aggressor country, rising world prices, and crop failures. In addition, it was noted that food can also become the basis for blackmail of the world community by the aggressor. The paper analyzes the losses caused to the agricultural sector as a result of the full-scale Russian invasion and their consequences for Ukraine and the countries of the world. It was found that the Government of Ukraine, to ensure national food security, has prepared an action plan to ensure food security under martial law and created a National Food Security

Platform. The study gives grounds to assert that despite the military aggression of the Russian Federation and significant losses of material, economic, and labor resources, Ukraine can ensure its food security and remains an essential exporter of the food security of many countries. The need for joint concerted efforts of the world community to counter the aggressor to ensure national and global food security is also determined.

Keywords: food security, economy, production system, agricultural products, exports, imports, risks, martial law.

Statement of the problem

The problem of ensuring food security is of strategic importance and a priority for each country. Neither the change of the world political system nor the scientific and technological development of the world civilization in any way changes the importance of food security for the state. This also applies to Ukraine's national economy. Now, this problem requires even more attention from scientists and practitioners because the impact of full-scale military aggression of the Russian Federation has devastating consequences not only for the Ukrainian economy but also for the food security of the world.

The country's practical food security system should provide the population with the necessary food based on the national agro-industrial complex. Such a system is aimed at firstly, the sustainable provision of the population with food at the appropriate level and an adequate response to the food market; secondly, to provide different categories of the population with the necessary amount of food assortment, considering the level of their solvency; thirdly, ensuring the protection of the domestic producer of goods from import dependence both in food and resource supply.

The state's food security system is entrusted with solving the problems of food imbalances, the contradictions that have accumulated and arisen in national food balances, and the organization of guaranteed provision of food to the population, which emphasizes the relevance of this article.

Literature review. The problem of food security began to be actively investigated in the second half of the twentieth century. It should be emphasized that experts need to come to a consensus on the essence of food security. Various aspects of food security are considered in the works of I. I. Lukinov, P. P. Borshchevsky, G. O. Kolesnik, P. T. Sabluk, O. P. Petrenko, A. A. Shevchenko [1], O. Galitsky, O. P. Dyachenko [2], O. Gvozdev [3], O. V. Ulyanchenko, N.V. Prozorova [4], Yu.Ya. Luzana, N.S. Poziabova [5], O.I. Goichuk, M. J. Khorunzhogo, P. F. Kulinich [6] Negrey M. V. [7] and others. The essence of food security in Ukraine is revealed in several normative legislative acts based on global approaches, considering national economic opportunities. The Law of Ukraine "On Food Security of Ukraine" [8] defines state policy's legal, economic, social, environmental, and organizational principles.

The results of research in the field of food security are reflected in the works of M. Buzhanskaya, T. Shabatura [9], S. Tyutyunnikova, and I. Skochko, A. Surilova, who are devoted to ensuring food security in the context of the coronavirus pandemic.

However, the impact of Russia's armed aggression against Ukraine on the state of food security under martial law, which was introduced in Ukraine from the first day of the war, remained out of their attention.

The purpose of the research

Research methodology, data, and hypotheses. The article aims to substantiate the possibilities of ensuring the effective functioning of the food security system of Ukraine under martial law.

The study's methodological basis is general economic principles and methods of a systematic approach (a generalization of factors of effective functioning of the food security system of Ukraine).

In the process of research, methods were used: analysis and synthesis (to adapt the production of agricultural products under martial law), economic and statistical (in identifying trends in the export of significant crops), abstract-logical (to formulate theoretical generalizations, systematization and theoretical justification of the need for rapid transformation of production, ensuring the economic stability of the state and the formulation of conclusions), tabular-graphic (to display analytical information).

Presentation of the main research material

They are solving the problem and getting the result. Food security of the state is the degree of provision of the country's population with environmentally friendly and healthy domestic food products at scientifically sound standards and affordable prices while maintaining and improving the habitat. Food in human life plays a unique role. Experts believe that during the life of the modern generation, the food problem can develop into a deep international crisis [4]. The state's food security is an integral part of the overall economic security, as represented by Figure 1, which, in turn, is part of the state's public security.

The primary food security condition is providing food to the population. Food availability comes in three forms: physical, economic, and social. Physical accessibility is the simple presence of vital products in the consumer market. Economic - includes the financial opportunity to obtain the necessary products. Social - involves minimal differentiation in the consumption of the main groups of food products among different segments of the population. The food security of Ukraine has significantly deteriorated with the beginning of a full-scale military invasion of the Russian Federation. This is especially true of the territories occupied and where military operations occur.

Ensuring the effective functioning of the food security system depends on the following factors: the stability of the subsystem of provision, investment policy, the formation of a subsystem of technical support, the improvement of tax legislation, the organization of banking services, the creation of inventories of material and technical means, the current system of insurance of crops and property of enterprises of the agro-industrial complex, scientific and information support.

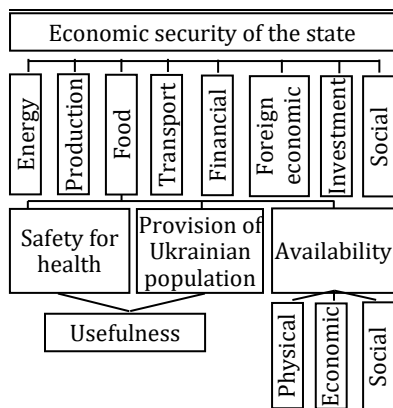


Fig. 1. Food security in the structure of economic security of the state

Source: compiled by the authors

The degree of food security of the state can be estimated by analyzing the following indicators: the state of health of the population, as one of the main conditions ensuring sustainable and progressive development of the state; life expectancy and demographic situation; the existence of a national program for the development of the agro-industrial complex, fisheries and forestry; provision of the population with food; the state of the industries producing food; quality of food; availability of food to all segments of the population; volumes and possibilities of building up strategic food stocks in case of unforeseen and emergency circumstances; state of production, scientific and technical base; opportunities to preserve and improve the habitat.

In our opinion, the food security of our state can be ensured under the following conditions:

- increasing the economic availability of food products for the formation of a healthy diet for all groups of the population;
- ensuring the physical availability of food products through the development of interregional integration in the field of food markets and food supply, the effective use of mechanisms for supporting regions, the development of transport and logistics infrastructure;
- formation of the state reserve of agricultural products, raw materials, and food, determined by the vocabulary of relevant material values and norms of their accumulation;
- increasing crop yields, preserving, restoring, and increasing the fertility of agricultural land, observing science-based technologies for the production of agricultural crops, balanced land use, and irrigation agriculture, attracting arable land that is not used in certain regions to agricultural turnover;
- reducing the share of waste in the agro-industrial complex, creating a system for the disposal of food waste and animal waste;
- ensuring biological safety of the country through the implementation of anti-epizootic measures, preventing the emergence and spread of animal diseases, including zoo noses, creating an effective system of state control over the production and content of genetically modified products;
- limiting the use of antimicrobials as growth stimulants in livestock, poultry, and crop production, ensuring control over antimicrobial resistance in veterinary medicine;
- development of breeding, seed production, and fodder production;
- expanding the potential of fish farming facilities, aquaculture, and new technologies for their cultivation;
- development of the scientific potential of agriculture, the introduction of accurate and digital technologies;
- improvement of mechanisms for regulating the market of agricultural products, raw materials, and food;
- improving the mechanisms of state support for agriculture and fisheries;
- ensuring state control over the safety of food products;
- stimulating producers to enrich food products (fortification and biofortification);
- strengthening food commodity chains in humanitarian situations;
- development of infrastructure, including the development of a network of wholesale and distribution centers for the purchase of products from agricultural producers, processing, storage, and marketing, and promotion of producers' access to food markets, including through the development of electronic commerce;
- priority attraction of investments in the production of vegetables and melons, fruits and berries, animal products (including rabbit breeding, goat breeding, sheep breeding, fishing, and aquaculture), new crops taking into account climatic changes;
- attracting investment and public funding in research, innovation, and dissemination of knowledge and experience in order to increase the productivity of agricultural production;
- development and implementation of a system of regular monitoring of the state of food security in the country;
- ensuring the popularization of a healthy type of food by developing educational programs for rational and balanced nutrition, creating special training programs with the involvement of the media, introducing special labeling of food products;
- Expanding the range and volume of food product production with a reduced content of saturated fatty acids, trans isomers of fatty acids, sugar, and salt.

The Ukrainian agricultural sector has had to adapt and continue working during the war for over a year.

During this time, the Ukrainian agricultural sector suffered a drop in export rates, difficulties with logistics reorganization, the energy crisis, and a rise in logistics costs.

The total losses inflicted on Ukraine's agricultural industry because of a full-scale Russian invasion have already amounted to more than 5 billion US dollars. The USA. However, until the war's end, it was impossible to calculate the damage suffered by the Ukrainian agricultural sector accurately. Therefore, the article relied on indirect damage assessment methods presented in Table 1.

In the damage structure, the most significant losses are recorded due to the destruction or partial damage to agricultural land and non-harvesting – 2.135 million US dollars. The USA's agricultural land suffered two significant types of damage: mine pollution and direct physical damage.

It should also be noted that the significant losses incurred due to damage to agricultural machinery and damage or destruction of granaries should be noted.

Table 1. Damage size by category

Category	Total cost (million USD USA)
Agricultural land and uncollected harvest of winter crops	2135,0
Machinery equipment	926,1
Storage facilities	272,4
Livestock	136,4
Permanent crops	89,1
Production factors (fuel, fertilizers, etc.)	119,6
Stored Products	613,0
Only	4292,3

Source: compiled by the authors

The estimated value of the dead animals is more than 136 million US dollars. Domestic animals die not only directly from active hostilities but also from limited physical access to farms and limited ability to purchase feed and provide veterinary services. The estimated number of animals that died because of Russian aggression in the affected areas is 42 thousand heads of sheep and goats, 92 thousand heads of cattle, 258 thousand pigs, and more than 5,700 thousand heads of poultry.

Compared to last year, the livestock sector in Ukraine decreased by 15% since those regions of Ukraine suffered, where, at the beginning of last year, the most significant number of farms was concentrated. These are Chernihiv, Kharkiv, Sumy, Kyiv, Donetsk, Lugansk, Mykolaiv, Kherson, and Zaporizhzhya regions, where at the beginning

of 2022 1/5 of the total amount of meat in Ukraine was produced, about a third of dairy products and almost half (44.8%) of eggs.

The war has significantly affected the sowing campaign of winter crops in 2022; therefore, we can assume that the production level of winter crops in 2023 will remain at the same level. Instead, the losses due to the reduction in winter crop production in 2023 may be significantly higher due to lower yields caused by lower quality of sown wear, less use of plant protection products and fertilizers, etc.

Assuming unchanged productivity, a relatively moderate decline in livestock production due to war is expected, within 10% compared to the baseline scenario. Annual losses of livestock and beekeeping are estimated at 348.7 million dollars—the USA.

Supply disruptions, as well as an increase in the cost of energy carriers, led to a significant increase in the cost of production factors, including mineral fertilizers and fuel.

Manufacturer losses due to logistics violations can be estimated at \$18.5 billion. The USA. One consequence of the invasion of the Russian Federation is the reduction of prices for export-oriented crops (wheat, corn, barley, and sunflower). The primary reduction in domestic prices for these crops was caused by the naval blockade of Ukrainian ports by the Russian Federation's military forces. The naval blockade forced exporters to rebuild logistics chains from exports by sea to exports by rail, river ports, and trucks.

This led to a significant increase in shipping prices (from an estimated \$30. US per ton of products up to 170-200 US dollars per ton) and a significant reduction in demand for export-oriented crops due to physical restrictions on export channels. As for grain exports, for eight months of 2022, the reduction is 19%, and oils - 11%. In general, the volume of Ukrainian exports in terms of physical weight amounted to almost 100 million tons, which is 38.4% less than last year. Thus, exports in 2022 amounted to 44.1 billion US dollars, 35% less than in 2021 [10].

The leader is corn. Exports of this commodity group amounted to 24.99 million tons, worth \$5.94 billion. Although this is 1% more than in 2021, that, against the background of all indicators, is a sensation. Sunflower oil ranks second in export value: Ukraine exported 2.7 million tons of this product, worth 1.255 billion dollars, 33 times more than the previous year.

At the end of 2022, Ukraine exported agricultural food worth \$23.6 billion. Ukraine increased agricultural exports to the European Union by 66%, exporting agricultural products thereby \$13.1 billion.

The rating of the primary consumers of Ukrainian agricultural products in the context of individual countries has undergone fundamental changes for 2022. Last year, Poland was the largest importer of Ukrainian agricultural products, displacing China in this position. In second place among the main importers of Ukrainian agricultural products was Romania, which was not even included in the first 20 until 2022. Turkey is on the third line of the rating, with imports 51% more than the previous year.

Ukraine is the leading agrarian state in the world. It can provide food for almost 400 million people. However, with the outbreak of war, the state of food security in Ukraine has deteriorated significantly. As noted in the annual report on the Global Food Security Index (GFSI), developed with the support of the international agricultural company Corteva Agriscience, the state of food security in Ukraine has deteriorated significantly - the country ranks 71st among 113 countries. However, last year its place was 58. Ukraine ranked last in the European ranking (26th out of 26) and on the global map ranked 65th among 113 countries. In Ukraine, food supply in the temporarily occupied territories and regions where regular food supplies have ceased due to hostilities has been disrupted. In addition, the range of food products and, to some extent, their quality has deteriorated. Therefore, the UN has included Ukraine among the twenty world countries threatened by hunger [6].

Russian aggression against Ukraine has led to an aggravation of the food problem not only in Ukraine but also in many regions of the world. So, due to Russia blocking our seaports, domestic farmers have lost the opportunity to sell grown products freely. Developed countries in Europe also felt the lack of agricultural products supplies from Ukraine. So, in the UK, some retailers began to limit the sale of sunflower oil "in one hand" precisely because of the violation of its supplies from Ukraine. Moreover, European farmers began to buy more genetically modified (GMO) feed for livestock in the United States and South America after the Russian invasion stopped supplying corn from Ukraine that does not contain GMOs. This means that due to the global food crisis caused by Russian aggression, EU countries are forced to retreat from the high environmental and food standards they have achieved over the past decade.

At the same time, in those countries whose food well-being is ensured mainly or entirely through importing agricultural products, the aggravation of the food problem is significant. In some of these countries, it has reached a critical level. As UN Secretary-General António Guterres noted, the war in Ukraine can doom a significant part of humanity to hunger and poverty, unprecedented in decades. It primarily threatens millions of people in Africa and the Middle East with malnutrition and hunger. The resumption at the end of July 2022 of the work of three seaports of Ukraine within the framework of the "Grain Agreement" under the conditions of shelling by the aggressor or their constant threat does not ensure the necessary volumes of supplies of domestic agricultural products to consumer countries. Ukraine's attempts to add Mykolaiv seaport to the seaports of the Odesa region for the export of Ukrainian food products have not yielded positive results due to Russia's negative position on including this port in the "Grain Agreement."

Thus, the Russian aggression against Ukraine, which began on February 24, 2022, and continues to this day, has become a global test for food security not only for our country but for the whole world. In addition, this aggression can cause political instability in dozens of countries and other international disasters.

In this regard, the search began for ways to effectively respond to the worsening food situation due to Russia's military aggression against Ukraine. So, in June 2022, in the US Senate, lawmakers from both parties presented a resolution condemning the use of hunger as a weapon of war in Ukraine and other countries. This resolution, among other things, calls on the Government of the United States of America to make sure that the use of hunger as a weapon of war falls within the scope of instruments that provide for responsibility for the actions of individuals, governments, law enforcement agencies, organizations, for example, the Global Magnitsky Act. The resolution also calls on the United States and its partners to work together to restore global stability and hold individuals and governments accountable for conflicts that lead to global hunger and threaten the food security of many countries.

To overcome the consequences of military aggression and ensure the country's food security in Ukraine, the National Food Security Platform was created based on the State Food Consumer Services. This allows combining the efforts of military administrations, food producers, trade networks, and international organizations to stimulate the development of the Ukrainian economy, even in conditions of war, and providing food and essential goods to the population, servicemen of the Armed Forces of Ukraine, and territorial defense. Its value for enterprises and other participants is that it provides access to up-to-date information on the real needs and offers of certain goods, which significantly simplifies the options for finding a market for manufacturers of products; the possibility of their instant communication with the buyer or supplier without unnecessary intermediaries; ordering transportation services; in a few days - intelligent contracts for several of the public offers and access to government orders without unnecessary papers and loss of time [11].

Also, the Government, by order of 29.04.2022. No. 327-r, identified several tasks for ministries, other central executive bodies, regional military administrations, and the Ukrzaliznytsia joint-stock company to ensure food security under martial law. These tasks are: monitoring the state of food security; ensuring uninterrupted production of agricultural products and food products; meeting the urgent needs of the functioning of the state to provide the population of territorial communities in the regions in whose territory active hostilities continue with long-term food products; formation of an extensive network of storage of reserves of raw materials and food resources to meet the strategic needs of the state; creation of opportunities for self-sufficiency in food products of territorial communities and households; ensuring the entire functioning of agro-industrial enterprises, in particular by satisfying the need for imported components; regulation of filling the domestic market with domestic products and ensuring export demand [12].

Conclusions and prospects for further research

The study suggests that despite the military aggression by the Russian Federation and significant losses of material, economic, and labor resources, Ukraine can ensure its food security and remains a significant exporter to many countries. At the same time, we can conclude that the modern world becomes highly vulnerable to the consequences of any crisis because, regardless of their scale, they have an extraordinary impact on both national and global food security, and overcoming their consequences is possible only through the joint concerted efforts of the world community. This applies both to the fight against large-scale pandemics and to countering the armed aggression of the Russian Federation through sanctions and providing comprehensive support to Ukraine in protecting its sovereignty and territorial integrity.

The Government of Ukraine has prepared a plan of measures to ensure food security under martial law and created a National Food Security Platform to ensure national food security. To reduce the negative impact of the war on global food security, the international community's joint efforts prepared and concluded an Initiative for the safe transportation of grain and food from Ukrainian ports in the context of the ongoing armed aggression of the Russian Federation against Ukraine. However, the situation with blocking the export of Ukrainian food suggests that in today's globalized world, the aggressor country can use both energy carriers and the seizure of nuclear facilities and food to blackmail the world community, pushing individual countries to the brink of starvation. Therefore, the world community needs to resolve the issue of preventing crisis situations in the early stages of their origin to prevent blackmail in the future because it is indisputable that any crisis situation is cheaper to prevent than to eliminate its consequences.

Ukrainian farmers showed invincibility. Of course, after the war's end, there is a long work to restore the industry. However, the Ukrainian agricultural industry has all the prospects to quickly get back on its feet and become a driver of the economy. The willingness to work selflessly on the part of Ukrainian agricultural producers

and their partners' patriotic position give hope for restoring not just the agrarian sector but for creating chains to produce truly high-quality Ukrainian products.

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Стаття надійшла до редакції 15.01.2024 р.