

UKRAINIAN FOOD SECURITY: WAR RISKS AND POST-WAR OPPORTUNITIES

Kateryna PROKOPENKO,

PhD in economics, Leading Researcher

Institute for Economics and Forecasting, NAS of Ukraine

<https://orcid.org/0000-0003-1456-4432>, k_prokopenko@ukr.net

DOI: <https://doi.org/10.36004/nier.cecg.II.2022.16.13>

Summary

Throughout the period of independence, the agricultural sector of Ukraine provided a sufficiently high level of food security. Military actions on the territory of Ukraine have critically affected the state of food security in Ukraine and rest of the world. It has posed a number of challenges to Ukrainian agricultural sector. In this context, it is necessary to identify the main risks and assess the provision of the main types of agri-food products in the conditions of hostilities and to establish directions and prospects for further sustainable development of the agricultural sector.

The aim of the article is to assess the impact of the war on food security in Ukraine and the post-war prospects of the agricultural sector in compliance with the principles of sustainable development.

Research methods: *general scientific and special, qualitative and quantitative, theoretical and empirical, balance method.*

The results. *The prioritized goals set during the war and the post-war period (in short run) are to ensure food security, employment in the agri-food sector and income of a significant share of population dependent on this sector. The population should be provided with food in sufficient quantities and nomenclature, while the food surplus should be exported, taking into account the current logistics capabilities. However, the post-war development of Ukrainian agricultural sector in the long run should take place in accordance with the concept of sustainable resource-conserving agriculture, which meets the goals of conservation and reproduction of natural resources.*

Keywords: *agricultural sector, food security, world, agri-food products.*

JEL: *O13, O20, Q18, Q20*

UDC: *338.439.02(477)*

Introduction. The domestic agricultural sector and its efficiency should be evaluated from the standpoint of its role in the national economy and its impact on the life of the entire society. The main purpose of agriculture is to meet the needs of the population in food as material production and the spiritual life of people are impossible without it. Well-being in the food sector determines the success of all economy. Without solving the issues of sustainable food supply, it is impossible to build a strong economy, as well to maintain elementary economic independence. The lack of food can cause severe social upheavals, while full security serves as the basis for the stability and balanced development of the state.

During the independence, the agricultural sector of Ukraine ensured a sufficiently high level of food security. The production of most of the main agricultural products made it possible to guarantee the country's food independence. In particular, the production of grain in 2021 more than quadrupled the country's domestic needs. Because of this, farmers obtained significant income from the export of products and ensured global food security. In 2021, Ukraine depended only on the import of fruits and berries (by 20%) and dairy products (by 5%).

Military actions on the territory of Ukraine critically affected the state of food security in Ukraine and the world and posed a number of challenges to the country's agricultural sector. The ongoing war in Ukraine has already significantly changed the disruption in domestic and foreign food markets due to the destruction caused by it in the sphere of production and sale of agro-food products.

In the period of hostilities, the importance of the problem of ensuring national food security increases many times over, although the country still has sufficient reserves of food products. The war in Ukraine significantly reduced the scale of agricultural production and changed its structure, which in the near future may affect the dynamics of agricultural production and the state of national food security. In addition, the war has a negative impact on the incomes of the population, so the share of food costs in total costs is expected to increase, which is one of the key indicators of food security. So, the purpose of this study is investigating the impact of the war on food security in Ukraine and the post-war prospects of the agricultural sector in compliance with the principles of sustainable development.

Literature review. The issue of food security is given a special place in the concepts of national security at the expense of the developed countries of the world. Throughout the history of mankind, food supply has remained one of the most urgent problems of national security of all countries of the world.

In Ukraine, such leading scientists and practitioners as O. Varchenko, O. Hoychuk, T. Zinchuk, P. Laiko, B. Paskhaver, Ya. Pushak, P. Rusnak, P. Sabluk and others. However, despite a significant number of publications, numerous problems of forming the system and priorities of national food security remain unresolved or are under discussion.

Leading domestic scientists identified its economic component as an important component of the national security strategy, which includes food security as an independent object of the state's internal and external policy (Chechel, 2005). The modern interpretation of food security has certain differences, but the fundamental feature of the essence of this concept as a stable supply of food to the population remains the same in all definitions. Three approaches to defining food security are most common. Representatives of the first approach - mostly economists from countries with a developed market economy - use the definition of food security, which includes only consumption, namely the provision of guaranteed population access to food in the amount necessary for an active, healthy life. So, to achieve food security, there are different alternatives - import or self-sufficiency, and there is no significant difference between them when using such a definition. Among some domestic economists, the consumption criterion is also recognized as the only one (Schekovych, 2009).

Proponents of the second point of view highlight the country's ability to provide itself with the necessary volume and assortment of food products as another key position in understanding the essence of food security. According to this approach, the achievement of food security involves the implementation of the following main areas of solving the problem: maintaining food supply at a level sufficient for healthy nutrition; ensuring the appropriate level of solvent demand of the population; eliminating dependence on imports and protecting the interests of domestic producers (Zelenska, 2012). The third approach is based on two criteria: availability on the country's food market of the amount of food that is sufficient to maintain a healthy lifestyle of the population; the availability of these products for absolutely all segments of the population (Shebanina, 2007). The above-mentioned higher approaches place an emphasis primarily on the individual and his interests in the sphere of ensuring his primary needs in food products, that is, the possibility of ensuring the physical and economic availability of food. In Ukraine most scientists are of the opinion that the problem of food security is not a shortage of food, but a low level of consumption due to insufficient purchasing power of the population, low wages and high prices.

Research methodology. In carrying out this research author applied such research methods as general scientific and special, qualitative and quantitative, theoretical and empirical, balance method. Calculations are based on the data from the State Statistics Service of Ukraine.

Author also used balance method for development of model for assess the possible volumes of export of agricultural products with strict adherence to the principles of sustainability in the further development. During the development of this model relevant international experience in food balances preparation was taken into account, specifically materials and recommendations developed by FAO, USDA and Eurostat (FAO, 2001; FAO, 2017; USDA, 2016; European Commission, 2018).

As a result, the following general scheme of forecast balances preparation, coherent with international FAO recommendations, was adopted:

$$\text{DEMAND} = \text{SUPPLY}$$

$$\text{SUPPLY} = \text{STOCK at the beginning of the period} + \text{PRODUCTION} + \text{IMPORT}$$

$$\text{DEMAND} = \text{DOMESTIC CONSUMPTION (human consumption} + \text{seeds} + \text{livestock and poultry feed} + \text{industrial use} + \text{losses} + \text{other consumption)} + \text{EXPORT} + \text{STOCK at the end of the period}$$

A significant challenge for the analysis and forecasting of Ukrainian food security is the difficulty of assessing the current situation, as complete statistical information is practically absent. In the context of limited official statistics, administrative data and survey results conducted by various organizations have also become available as alternative sources of information used in these difficult circumstances.

Main results. Providing the population with high-quality food products necessary for active social and economic reproduction is the main task of the agrarian policy of any state. Food security efforts guide the food system to the ideal possible state. For example, such a state can be characterized by independence for certain groups of food products and the formation of significant export potential,

independence in making strategic decisions, reliability of supply and stability of reproduction of food resources, provision of physical and economic availability of food for various categories of the population.

Food security includes aspects such as availability, accessibility, consumption and stability. As defined by the Food and Agricultural Organization, food security exists when all people physically, socially, and economically have the opportunity to obtain safe and healthy food in sufficient quantities that meet their nutritional needs and preferences and allow them to lead an active and healthy lifestyle (World Food Summit, 1996).

To achieve the goals of food security, all four aspects must be fulfilled simultaneously:

- availability of food products: availability of a sufficient amount of food products of appropriate quality, supplied at the expense of domestic production, imports and food aid;

- availability of food products: human access to appropriate resources for purchasing appropriate products with the necessary nutritional properties;

- consumption of food products: an appropriate diet, clean water, sanitary conditions, health care are necessary to ensure the food well-being of the population. This aspect explains the importance of the non-food contribution to ensuring food security;

- food security: a population, household or individual must have constant access to adequate food without the risk of losing such access that may arise as a result of sudden unforeseen events, such as an economic or climate crisis.

Food safety is a complex problem that includes both technological factors and environmental factors. Technological factors - from improved crop varieties and farm management systems to improved decision support tools for strategic long-term planning purposes - increase agricultural productivity. However, despite these advances, agricultural systems are failing to prevent the problem of food insecurity, and programs aimed at improving agricultural practices should continue to be improved.

The pre-war state of food security. Ensuring food security at the national and global levels on the basis of sustainability is one of the priorities of Ukraine's agrarian policy. In the pre-war period, Ukrainian agriculture steadily increased the volume of produced products. Only since 2010 by 2021, they increased one and a half times, although it should be noted that the growth processes occurred unevenly, namely due to an increase in the production of plant products. During the above-mentioned period, crop production increased by 69.7%, and livestock production - by 0.1%, that is, livestock production in Ukraine as a whole is characterized by stagnant processes. In 2021, the production of agricultural products increased by 16.4%, and the turnover of retail food trade increased by 5.7%, which testified to the intensification of consumer attitudes of the population, which was caused by the growth of the real disposable income of the population (in 2021, it amounted to 104, 3% to the corresponding period of the previous year).

In recent years, the country has taken one of the leading positions in the world market of grain and technical crops and for several years in a row has been among the top three grain exporters. As a result of this, the products of the agro-food sector,

namely crop production, form the basis of the commodity structure of Ukrainian exports. In 2010 the share of agri-food exports in the country's total exports was 19%, and in 2021 - increased to 40.7%, accounting for almost half of the country's foreign exchange earnings. In 2021, grain crops accounted for 18.1%, ready-made food products - 5.6%, fats and oils of animal or vegetable origin - 10.3%, seeds and fruits of oleaginous plants - 3.6% in the structure of total exports.

The export orientation of Ukrainian agricultural sector has had a significant impact on the dynamics of incomes of national producers of agricultural products and food. The increase in income allowed them to expand the introduction of new technologies, and international competition contributed to the improvement of production and the improvement of product quality.

All this had a positive effect on Ukraine's food security. The assessment of domestic indicators of the consumption of the main types of food by comparing the actual level of food consumption with its normative indicators approved by legislative documents shows that in the pre-war period, the average indicators of food consumption in the country managed to overcome the barrier of minimum standards, although the average actual level of nutrition was still significantly less than the rational norm.

The dynamics of the indicator of food availability in Ukraine coincides with the historical trend of food sufficiency. In 1990, the average family spent 32% of its income on food, in 2000 – 64%, in 2020 – 48.1%. For comparison: in the USA this figure is 10%.

The assessment of the state of food security is provided by a comparison of the actual level of food consumption with its normative indicators approved by legislative documents. Currently, the average indicators of food consumption in the country have managed to overcome the barrier of minimum norms, surpassing them in terms of calorie content. At the same time, the average actual level of nutrition is significantly less than the rational norm.

Due to low purchasing power, the average consumer prefers cheap energy sources, for which the actual consumption reaches or is slightly lower than the norm of rational nutrition (potatoes, oil, vegetables, eggs). On the contrary, for a set of more expensive energy sources, the actual food consumption is less than rational norms (meat, dairy products, fish, fruits and berries). This indicates the still unsatisfactory state of food security in Ukraine, as the average indicators of food consumption do not meet the norms of healthy nutrition either in terms of volume or structure (Table 1).

Table 1. Normative and actual food consumption in Ukraine, per person per year, kg

Products	Food consumption norms			Deviation of actual consumption from minimum standards
	minimal ¹⁾	rational ²⁾	fact in 2021	
Bread products	95	101	92,7	-2,3
Potatoes	96	124	132,4	36,4
Sugar	32	38	28,5	-3,5
Oil	8	13	13,6	5,6
Eggs, pcs	230	290	272	42
Meat and meat products	52	80	53,0	1,0
Milk and milk products	340	380	201,5	-138,5
Fish and fish products	12	20	13,2	1,2
Vegetables, water-melons, melons and gourds	105	161	165,9	60,9
Fruits, berries and grapes	68	90	59,0	-9,0
Calories, kcal per capita	2730	3373	2677	-53

Source: according to the State Statistics Service of Ukraine.

¹⁾ Approved by the Resolution of the Cabinet of Ministers of Ukraine dated April 14, 2000.

²⁾ Recommended by the Ministry of Health of Ukraine.

In the pre-war period, there was a tendency to gradually improve the nutrition structure. In particular, the consumption of meat, fish products, vegetables, fruits and berries gradually increased. The decrease in the caloric content of the diet is a consequence of such a positive trend, since previously high caloric values of the diet were achieved due to the predominance of high-calorie cheap carbohydrates, namely: bread and bread products, potatoes, sugar, oil. In addition, the ratio of proteins of plant and animal origin in the diet, as well as the presence of the appropriate amount of vitamins, minerals, and microelements necessary for the human body, is still not optimal.

The analysis of such ratios shows the irrationality of the consumption structure of the population of Ukraine. For several years in a row, the rational consumption norms of potatoes and vegetables have been exceeded, although the exceeding of the rational consumption norms of vegetables should be noted as a positive trend. At the same time, the consumption of such products as meat, milk, fish, that is, the main suppliers of proteins for the human body, is much lower than the rational norms. In 2021, in Ukraine, meat and meat products were consumed on average per person by 34% less than the norm, milk and milk products by 47%, and fish by 34%.

For several years in a row, the analytical unit of the British media corporation The Economist Group has been assessing global food security, namely the Global Food Security Index (GFSI) is calculated for 113 countries. International assessments showed that in 2021 Ukraine was in 58th place in the world or 25th in the European region (Global Food Security Index, 2021). Ukraine had the best indicators according to the criterion of food quality and safety (55th position) and natural resources and sustainability (56th place). A detailed study of the GFSI index made it possible to establish the main risks of food security in Ukraine in the pre-war period. The most risky criteria of the index for Ukraine during the evaluation period (that is, those that

deviated most negatively from the world average) included: financing of food security programs, low amount of public spending on scientific research in the field of agriculture, risk of political instability, corruption risks, agricultural, road and irrigation infrastructure, low level of commitment of the country's government to improve the country's nutrition standards, water and land resource problems, etc.

The leading positions in this rating are achieved primarily due to the high level of GDP per capita, as well as the low share of food costs in the structure of total consumer spending of households, the introduction and development of high-tech production in the food industry, the formation of a mechanism for ensuring the country's food security, which so far are the key problems of the economic development of Ukraine.

One of the main factors restraining the improvement of food consumption of the population is the low level of growth of real incomes, which is indicated by the preservation of a high share of food expenses in the aggregate expenses of households. For many years now, the share has been half of all total costs, with a tendency to decrease. Thus, in 2021 it was 45.9%, the growth of real disposable income in the III quarter of 2021 (the closest available data) was 106.8% compared to the previous period, while in 2020 the growth of real disposable income was only 102.6%, and the share of food expenses in total household expenses is 48.1%.

In the pre-war period, the domestic agricultural sector almost completely ensured a high level of food security in the country and had a significant impact on global food security. However, the ongoing war in Ukraine has already significantly changed the situation on the domestic and foreign food markets due to the destruction caused by it in the field of production and sale of agro-food products.

The impact of hostilities on food security. Military actions on the territory of Ukraine have had a critical impact on the state of food security in Ukraine and the world. This year presented a number of challenges to the agricultural sector of the country, in particular, there was the risk of disruption of the sowing campaign against the background of high global prices for gas and, accordingly, fertilizers, problems with fuel during sowing, etc. Active hostilities are currently taking place in those regions where a significant part of wheat is traditionally grown - Kharkiv, Mykolaiv, Zaporizhzhia oblasts, significant territories of Kyiv, Chernihiv, Zhytomyr, and Sumy oblasts are mined. As a result, this led to a decrease in yields, areas under crops and harvests of almost all agricultural crops.

The hostilities caused significant migration processes in Ukraine. In particular, according to the latest data of the International Organization for Migration, the estimated number of IDPs in Ukraine is 6,975,000 people. This may cause pressure on regional consumption funds, which will change significantly due to population migration from the eastern and southern regions to the western and central regions. The consumption fund in Ukraine will also change significantly, because according to the Migration Data Portal individual refugees from Ukraine recorded across Europe since 24 February 2022 as of 22 September 2022 are 7,405,590 (Migration Data Portal, 2022). This is 18% of the population of Ukraine as of the beginning of 2022. This will significantly affect the consumption fund, since to ensure the consumption of products at the pre-war level, an 18% smaller consumption fund will be needed.

According to the Ministry of Agrarian Policy and Food of Ukraine (Ministry of Agrarian Policy and Food of Ukraine, 2022), about 67 million tons of grains, legumes and oilseeds will be harvested this year in the conditions of war, which is one of the 5 best results during the years of independence. In particular, it is expected to collect 50-52 million tons of cereals and legumes, 15-17 million tons of oil crops. In the current year, the harvest of wheat amounted to 19.2 million tons, which is less by 41.5 percent, respectively, and barley - 5.5 million tons, which is less by 45.3 percent, respectively. At the same time, the domestic consumption of fodder and food wheat is about 7.5-8 million tons per year. The annual consumption of barley is 2.5-3 million tons. Thus, against the background of livestock reduction, animal husbandry will be provided with fodder. About 140,000 to 150,000 tons of buckwheat are expected to be harvested, while domestic consumption is 100,000 to 110,000 tons. Currently, the collection for all crop groups exceeds the internal needs of Ukrainians by 1.5–3 times. An assessment of the capabilities of the agricultural sector to ensure food security in the conditions of hostilities and reduction of production was carried out, taking into account the migration processes that are currently taking place. The assessments proved that Ukraine's food security is fully guaranteed and there is an opportunity to export agricultural products to ensure global food security (Table 2).

Table 2. Production and consumption dynamics of agricultural crops in Ukraine, million tons

Products	Actual data for 2021			Expected data for 2022		
	production	domestic consumption	incl. consumption fund	production	domestic consumption	incl. consumption fund
Grain and legume crops	86,0	19,9	5,1	50,0	17,7	4,5
incl. wheat	32,2	7,4	4,1	19,2	6,2	3,5
barley	9,4	3,3	0,2	5,5	3,36	0,16
buckwheat	0,106	0,126	0,114	0,14	0,102	0,09
Sugar	1,4	0,13	1,18	1,2	1,15	1,0

Source: data of the State Statistics Service and author's calculations.

Among the most critical risks, we should single out problems with providing the population with vegetables due to the expected reduction in vegetable production as a result of hostilities in the south of the country and the temporary occupation of the Kherson region, military operations in the Zaporizhzhya and Mykolaiv regions.

Another challenge is the disruption of agricultural and food supply chains (from the producer of agricultural products to the sale of products to the consumer). Among the challenges of the war period, one should single out the probable shortage of labor resources, in particular, in the production of such labor-intensive types of products as vegetables and fruits.

A decrease in the number of animals will also affect the need for domestic consumption, that is, the cost of feed will decrease. In particular, according to the estimates of the Association "Swinemakers of Ukraine" (ASU), the industrial herd of

pigs in Ukraine has decreased by 10%, which takes into account both enterprises that were destroyed as a result of hostilities, as well as those that are under occupation and, accordingly, they cannot sell live stock on the domestic market. As of July, 50,000 cows were already lost (Agravery.com, 2022). This will negatively affect the current situation of providing the population with livestock products.

This is one of the critical problems of food security in the period of hostilities, which is the decrease in the purchasing power of the population. If in the structure of aggregate household expenses in the IV quarter. In 2021, food costs amounted to 45.7%. Taking into account the expected reduction of both nominal and real incomes of the population, as well as the growth of the consumer price index, the share of household expenditures on food will grow. According to NBU estimates, by the end of 2022, consumer prices may increase by more than 20%, and according to some pessimistic estimates, by up to 75%. As we expect the cost of agricultural products to increase by at least 50%, food will remain the main driver of price growth. At the same time, if the nominal incomes of the population decrease by 10% relative to the pre-war level, and food prices increase by 25-30%, the share of food costs in total costs may reach 60% (Shubravskaya & Prokopenko, 2022).

In general, Ukraine has a stock of basic products that guarantees food security for the population in the near future. If there are opportunities for a successful harvest, the country will be able to provide itself with basic food products, but there will be high risks in providing the population with livestock products, vegetables and fruits. In addition, significant challenges will be faced by the world community in maintaining food security at the global level.

Post-war development and the state of food security. Factors affecting food security include population growth, trade restrictions, insufficient capital investment in agriculture, and the global financial crisis. Climate change may exacerbate the problem of food insecurity. Agricultural systems are vulnerable to such climatic conditions as extreme events (heat waves, hurricanes, floods, droughts), extreme temperatures and precipitation, temperature rise, and their consequences (increase in runoff, decrease in soil moisture, melting glaciers as sources of meltwater for rural farms, heating of water in ponds and watercourses, soil erosion, etc).

It is also important to note that the global increase in productivity due to intensification and scalability (on the basis of large-scale production), inherent in the domestic agricultural sector, amplifies socio-economic contradictions in rural areas (reduction of jobs and the number of the population), food sector (standardization of rations based on cheap energy-rich components, unbalanced nutrition, significant food losses, etc.), the load on ecological systems is increasing.

In the long-term planning of directions for the post-war development of the agricultural sector, it is necessary to take into account the long-term prospects that will protect against the above-mentioned risks. In addition, Ukraine ratified the European Landscape Convention (Law of Ukraine No. 2831-IV dated September 7, 2005), which imposed obligations on the protection and sustainable development of agricultural landscapes. In particular, in order to ensure such development, the "Concept of the National Target Program for the Use and Protection of Land" (approved by the Decree of the CMU dated January 19, 2022 No. 70-r) declared by 2032: to optimize the structure of land plots; reduce agricultural development (by 5

percent) and plowed territory (by 10 percent); to optimize the structure of the agricultural landscape; to increase the productivity of agricultural land (by 40-50 percent) through the rational use of organic, organo-mineral and mineral fertilizers and chemical meliorants on acidic and saline soils; increase the area of land with natural landscapes to a level sufficient to preserve landscape and biological diversity (up to 10.5 percent of the total area of the country's territory).

Therefore, the post-war development of the agricultural sector of Ukraine in the long term should take place in accordance with the concept of ecological resource-saving agriculture, which meets the goals of preserving and reproducing natural resources.

In addition, the restructuring of agriculture must take into account the requirements of the European Green Deal (EGD), which has already been implemented by the EU - the action program of the European Commission for the transition to a climate-neutral Europe by 2050. Especially since in the pre-war period, the government of Ukraine announced the intention of our state to join the EGD.

Thus, when assessing the prospects for the post-war development of the agricultural sector of Ukraine, the above key, nationally oriented, goals of such development were taken into account, as well as the requirements of international documents, the implementation of which Ukraine intends to join in the near future.

Assessments of the optimal structure of agricultural land and calculations of the production potential of the main types of agricultural products were carried out, which were based on the following provisions: optimization of agricultural landscapes will be carried out and norms will be implemented to reduce agricultural development by 5% and plowed territory by 10% in accordance with the Decree of the Cabinet of Ministers of Ukraine dated 19 January 2022, No. 70 "On approval of the Concept of the National Targeted Program for Land Use and Protection"; the structure of sown areas will be optimized in accordance with zonal recommendations; the structure of crop production will fundamentally change in accordance with ecological requirements, and the number of livestock of agricultural animals will correspond to the area of available fodder lands (Shubravska & Prokopenko, 2022).

On the basis of the balance method, the volume of the country's internal consumption was estimated during the implementation of structural changes in production (Table 3). In particular, such articles of the balance of demand and supply for certain types of products were evaluated, such as the consumption fund that can be formed in the post-war period, the costs of products for processing and intra-farm use (sowing, planting, fodder), as well as losses. Since the goal of the structural restructuring of the agricultural sector is to achieve food security, that is, food sufficiency, when calculating the consumption fund, it was assumed to achieve rational consumption standards per 1 person. To estimate the consumption fund, it is currently difficult to predict the population size in the post-war period, as migration processes are still ongoing, the scale of which will depend on the activity and duration of hostilities in the country. However, it is already obvious that the population in the post-war period will decrease compared to the pre-war level, although, according to surveys, 84% of refugees plan to return home. According to some estimates, depending on the duration of the war, the loss of population will be from 600,000 to 5 million people, so for the calculations, losses at the level of 10% were determined.

Table 3. Expected production of the main agricultural products, taking into account environmental requirements, thousand tons

Products	Production in 2021	Expected production	Changes in the volume of production	Domestic consumption in 2021	Expected domestic consumption
Cereals and legumes	86011	73120	-12891	19856	25000
including: wheat	32151	29725	-2426	7426	7300
barley	9437	9350	-87	3308	4400
corn	42110	27170	14940	7613	10800
buckwheat	105,8	830		126	200
Sunflower	16392	9140	-7252	12348	9050
Sugar beet	10854	19300	8446	–*)	–
Potato	21356	23920	2564	21047	23900
Meat	3394	5090	1696	2197	3300
Milk	8729	13100	5119	9152	14090
Eggs, million pcs.	14071	21100	7029	12519	13165

Source: data of the State Statistics Service and author's calculations.

*) Sugar beet is used for processing, however, a 1.8-fold increase in production means a corresponding increase in sugar production, provided the sugar level of the raw material is maintained.

Estimates indicate that the production of the main types of food, with the restructuring of the agricultural sector on the basis of sustainability, will ensure food sufficiency for the country's population. At the same time, the production of a number of crops may decrease. In particular, enterprises of the agricultural sector may lose significantly in the production of corn (by 40%), wheat (about 10%) and sunflower (more than half of the volumes, which will accordingly affect the production of sunflower oil). However, these changes are necessary, since the share of cultivated areas under technical crops (primarily sunflower) is currently in the range of 35–50% depending on the region, which is an unacceptable violation of environmental requirements and in the long term leads to land degradation and a decrease in yields.

The above estimates also provide for the development of processing capacities, which is consistent with the need to speed up the transition from the raw agricultural sector to the processing of the obtained products. In particular, the probable growth of potato production in enterprises, so it will be suitable for industrial processing and export. At the same time, potatoes, taking into account the requirements of sustainable and ecological food production, create fewer greenhouse gas emissions compared to other main crops and at the same time ensure the receipt of cash by small producers.

Increasing the area of fodder land in accordance with ecological standards will allow to increase livestock and increase the production of livestock products, which will ensure the domestic consumption of meat and eggs in accordance with rational norms and expand the opportunities for exporting these products.

Discussion and conclusions. Ukraine, as a subject of the world agricultural market, has a number of competitive advantages, among which should be noted such as a high level of self-sufficiency in the main types of food and agricultural raw materials, stable growth of agricultural production in the long term, attracting investments in the agricultural sector, which allowed to increase innovativeness development of production, the presence of a tendency to increase the share of products with added value.

Along with this, there are potential threats to food security, which must be taken into account when forming an agrarian foreign trade policy. Thus, military actions and the destruction caused by them in the sphere of production, storage and sale of agricultural products, supplies of critical resources of agricultural production can significantly worsen the food security of the country's population and negatively affect its export potential. Additional risks are a noticeable narrowing of the domestic market due to a decrease in the purchasing power of the population and a reduction in its number against the background of blocking export supplies, as well as a sharp increase in the cost of production resources and, as a result, an increase in the cost price of domestic agricultural products and retail food prices.

The result of the post-war reconstruction of agricultural production should be the formation of its ecologically justified specialization, which will meet both nationally oriented goals and international requirements. This will make it possible to achieve a high level of food self-sufficiency of the population, to diversify exports by reducing the share of raw products and increasing the share of processed products, and to enter foreign markets with new types of products, as well as to implement the concept of ecological resource-saving agriculture and preserve national natural resources in the long term.

REFERENCES

- Agravery.com. (2022). Ukraine may lose a third of its dairy herd due to the war and already needs 50,000 heifers for recovery. URL : <https://agravery.com/uk/posts/show/ukraina-moze-vtratiti-tretinu-molocnogo-pogoliva-cerez-vijnu-ta-vze-potrebue-50-tis-goliv-neteliv-dla-vidnovlenna>
- Chechel, O. (2005). Regulation of the formation and development of the economy of the agro-industrial complex as the basis of food security of the territory. *Bulletin of the Sumy National Agrarian University. Series Economics and management*, 6-7 (18-19), 81-87.
- European Commission. (2018). Crop balances. Handbook. The European Statistical System Committee. URL: https://ec.europa.eu/eurostat/cache/metadata/Annexes/apro_cbs_esms_an1.pdf
- FAO. (2001). Food Balance Sheets: A Handbook. URL: <http://www.fao.org/docrep/003/X9892E/X9892E00.HTM> (accessed on 30 August 2022).
- FAO. (2017). Guidelines for the compilation of Food Balance Sheets. Rome.. URL: <https://www.fao.org/3/ca6404en/ca6404en.pdf> (accessed on 30 August 2022).
- Global Food Security Index. (2021). Strengthening food systems and the environment through innovation and investment / The Economist Intelligence Unit. London

- [etc.] : The Economist Intelligence Unit Limited. URL: <https://foodsecurityindex.eiu.com>.
- Migration Data Portal. (2022). Refugees and Asylum Seekers. URL : <https://www.migrationdataportal.org/ukraine/crisis-movements>
- Ministry of Agrarian Policy and Food of Ukraine. (2022). This year, for the first time, Ukraine will produce buckwheat 1.5 times more than domestic consumption, - Taras Vysotskyi. URL : <https://minagro.gov.ua/news/ukrayina-cogo-roku-vpershe-virobit-grechki-v-15-razi-bilshe-nizh-vnutrishnye-spozhyvannya-taras-visockij>
- Shchekovych, O. (2009). Formation of priorities and development of agrarian policy of Ukraine. Kyiv, NSC "Institute of Agrarian Economy", 278.
- Shebanina, O. (2007). Formation and effective development of the food sub-complex of the agro-industrial complex: monograph. K.: NNC IAE, 368.
- Shubravska, O., & Prokopenko, K. (2022). Ensuring food security of Ukraine: post-war context. *Economy of Ukraine*, 7. 21—42. <https://doi.org/10.15407/economyukr.2022.07.021>
- USDA Economic Research Service (USDA-ERS). (2016). Food Availability Documentation of the Food Availability (Per Capita) Data System. URL: <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/food-availability-documentation/> (accessed on 9 September 2022).
- World Food Summit. (1996). Rome Declaration on World Food Security. Rome. Italy. URL : <http://www.fao.org/3/w3613e/w3613e00.htm>
- Zelenska, O. (2012). Food security system: essence and hierarchical levels. *Bulletin of ZHTU*, 1 (59), 108-112.