

## FUNDAMENTALS AND TRENDS OF GLOBAL FOOD SECURITY

For a long time, Ukraine has been positioned as a guarantor of food security in many countries of the world thanks to its traditionally powerful food exports, and is consistently among the top five global exporters of grains and legumes. Ukraine's contribution to the world food market in 2021 was equivalent to providing food for about 400 million people. According to the results of the 2020-2021 marketing year, the export of grains and legumes and their processing products amounted to 44.9 million tons. In particular, 16.6 million tons of wheat, 4.2 million tons of barley, 18.4 thousand tons of rye, 23.1 million tons of corn, and 126.9 thousand tons of flour were exported. The importance of Ukraine's role was particularly evident during the COVID-19 pandemic, when global commodity supply chains were disrupted. Ukraine continued to fulfill its obligations and significantly contributed to the food security of its partners in the Middle East, Europe, Southeast Asia and North Africa. The United Nations has issued an emergency appeal for support to Ukraine<sup>1</sup>, in which it is noted that the sharp deterioration in the integrity of the food system in Ukraine caused by the war is capable of multiplying the number of food-insecure households, as agricultural producers leave war-affected areas, and also about the possible consequences of the crisis for food security outside of Ukraine, including countries that to one degree or another depend on food supplies from Ukraine. World organizations should act and make effective decisions that should contribute to the reliable provision of food to the population, increasing the economic and physical availability of food products<sup>2</sup>.

The concept of "food security" in modern scientific literature is defined as an important component of national economic security and predicts ensuring the normal functioning of such a biological system as a person, due to the majority of internal production of food products taking into account product quality standards, protecting the population from low-quality products, and internal market – from excess, dumping import supplies of agricultural products, creation of reserves, insurance reserves and conditions for agricultural producers to enter the foreign market.

One of the definitions of the concept of food security is "guaranteed, reliable and sufficient supply of basic foodstuffs to the population, absence of danger of hunger and malnutrition." In a broader sense, food security is considered as the ability of the state (provision of appropriate resources, potential and guarantees) to meet the needs of the population in food due to domestic production at a level not lower than medical standards. Food security is defined as the state in which people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life<sup>3</sup>.

According to the existing ideas, the reliability of food security is achieved through sufficient self-sufficiency in food products and the availability of funds for importing food in the necessary volumes. That is, the supply of food must be insensitive, even in the event of price increases, a lack of currency, and a ban on food supplies from the outside.

According to this approach to understanding the essence of food security, the goal of its achievement and provision is a guaranteed and stable supply of raw materials and food, not subject to the influence of external and internal factors.

With the advisory assistance of an expert group of specialists, the intelligence department of The Economist developed the Methodology for calculating the index of global food security. The expert panel included experts from the academic, non-profit and government sectors, such as the World Bank, the International Rice Research Institute, Tufts University, the Chicago Council on Global Affairs, the Institute for International Food Policy Studies, to help select and define key

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<sup>1</sup> Flash appeal Ukraine 2022. Humanitarian program cycle.

<sup>2</sup> Agronews 2022. Ukraine feeds 400 million people in the world.

<sup>3</sup> Антощенко В. В. Основні елементи ресурсного потенціалу сільськогосподарського підприємства як основа економічної та продовольчої безпеки, с. 292.

food security indicators using transparent and reliable methodology, selection of indicators, weighting and general structure of the global food security index<sup>4</sup>.

Food security is defined as a situation in which people have physical, social and economic access at all times to nutritious food in sufficient quantities to meet their nutritional needs for a healthy and active life.

The purpose of the study is to determine the foundations and trends of global food security in the context of vulnerability to economic, climatic and geopolitical shocks and to assess the Global Food Security Index of Ukraine.

The GFSI measures the drivers of food security in 113 countries across the factors of affordability, availability, quality and security, as well as the state of natural resources and sustainability. The index aggregates 58 unique indicators reflecting economic inequality, food availability, environmental conditions, and the state of natural resources. European countries show some of the best indicators in the whole world. Thus, Ireland, Austria, Great Britain, Finland and Switzerland occupied the first five highest steps of the Index. Of the four GFSI categories, the European region performed best in affordability<sup>5</sup>.

The 10-year anniversary of the Global Food Security Index (GFSI) allows data from the past decade to be analyzed to inform efforts to achieve the UN's Sustainable Development Goals of zero hunger by 2030<sup>6</sup>. This past decade has shown how important it is to look at hunger from an effective food systems approach. This involves weighing the physical and economic availability, quality and safety of food, and assessing how resilient nations are in protecting their natural resources to enable them to continue producing food now and in the future.

Over the past ten years, new elements have been added to the GFSI, reflecting the growing importance of markets, financial systems, technology and innovation in food security. At the same time, structural factors cannot be ignored, so the index weighs gender inequality and income inequality, as well as political and social risks related to corruption and military conflicts. The existential threat of climate change is now also an important factor. All of these measures reflect broader trends that have changed approaches to food security over the decades. After making rapid gains in the first few years of its inception, the GFSI scores across all nations peaked in 2019, before dropping over the past two years amid the covid-19 pandemic, conflict and climate variability.

This drop in GFSI scores has been seen across all regions and nations in all the different income tiers. However, high-income nations in Europe still lead the index, as they did a decade ago, taking up seven of the top ten places, with Ireland getting top spot, scoring 84 (all GFSI scores are marked out of 100).

Similarly, Sub-Saharan African nations continue to dominate the bottom ten spots on the index, taking up seven of these places, with bottom-scorer Burundi's score of 34.67 only 43% that of Ireland.

The GFSI shows that hunger (using undernourishment as a measure) and stunting in children are most tied to the quality and safety of food. Populations with diets that lack quality protein and micronutrients, and where access to drinking water is limited, score worse in food security.

Affordability is also closely linked to hunger. The GFSI shows that countries without comprehensive, well-funded national food safety-net programmes have higher levels of hunger (and stunting in children). Funding for these nets is the measure that has dropped the most over the decade, followed by a greater dependency on food aid.

Greater volatility in food prices since 2019 have affected how affordable food is – 70 countries slip in this year's GFSI rankings because of rising costs. Indeed, among the four pillars that make up the GFSI, Affordability has fallen the most over the decade.

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<sup>4</sup> Антощенко В. В. Організаційно-економічний механізм інноваційного розвитку сільськогосподарських підприємств, с. 168.

<sup>5</sup> Corteva Agriscience Announces Sustainable Development Goals for 2030. Corteva Agriscience.

<sup>6</sup> Impact economist. The Global Food Security Index 2022.

Natural Resources and Resilience is the lowest scoring pillar among the four categories of food security, dragging down the GFSI score overall. The countries in the index score only 50.8 out of 100 for this pillar, compared with a GFSI score of 60 across the board. While this is an improvement from 2012, it is only a slight rise from 50.1 in 2019, at a time when climate risks are taking centre-stage.

Conversely, the highest scoring pillar is for Quality and Safety of food. The average score across all nations is 68, driven by the widespread adoption of nutritional plans or strategies. This is key because diet-related diseases are the primary cause of premature death globally.

Finally, the Availability of food is ranked third after food Quality and Safety, and Affordability, with a score of 56.7. This is a jump from 53.4 in 2012; however, most of this rise came before 2019. While the overall Availability score is buoyed by a 41.5-point jump in crop storage facilities for all countries, it is dragged down by a drop in public expenditure on agricultural research and development (R&D).

The countries that are models for food security are those that score highly on all four pillars of food security. For example, top-scorer Ireland scores above 92 points for Affordability, and Quality and Safety of food, and above 74 points for the Availability and resilience pillars. Over ten years, Ireland has been able to keep food costs down at the same time as tackling inequality and ensuring that a safety net remains in place. It has seen a big jump in agricultural R&D and has been able to minimise food loss, helping to ensure that enough quality food is available. The government also has high nutritional standards and is politically committed to adaptation.

These trends have been replayed to some extent across the top ten most improved nations over a decade, which include countries like Tanzania, Oman and China, who have moved up because they have been able to tackle affordability, instil safety nets and boost market access. They have also cut back on volatility in production and committed to food security strategies and adaptation policies. Conversely, those nations that have deteriorated the most, like Venezuela and Burundi, have done so because they have been unable to keep food costs down, have not had sufficient food supply or market access, and have suffered from volatile production. The bottom ten nations have often not had the capacity to grow food security through investing in R&D, safety nets, food security strategies, national adaptation policies, risk management plans and nutritional guidelines. These policies, investments and regulations are essential to the construction of food-secure economies. In Table 1 it is investigated performance of countries based on their 2021 food security score.

*Table 1. Performance of countries based on their 2021 food security score*

Global ranking	Country	Overall score	Affordability	Availability	Quality and safety	Natural resources & resilience
1	Ireland	84.0	92.9	75.1	94.0	74.1
2	Austria	81.3	90.5	75.2	91.2	65.7
3	United Kingdom	81.0	91.1	72.7	89.6	69.0
4	Finland	80.9	91.7	66.2	93.8	75.1
5	Switzerland	80.4	89.0	76.9	86.4	65.1
6	Netherlands	79.9	89.7	73.7	92.2	61.2
7	Canada	79.8	87.6	77.7	94.5	54.4
8	Japan	79.3	90.0	75.7	83.4	61.9
9	France	79.1	90.3	67.0	92.1	67.5
9	USA	79.1	88.7	71.0	94.3	61.3
<b>58</b>	<b>Ukraine</b>	<b>62.0</b>	<b>73.9</b>	<b>51.8</b>	<b>71.9</b>	<b>49.3</b>
113	Burundi	34.7	24.0	33.7	45.7	44.8
-	<b>Average</b>	<b>60.9</b>	<b>66.7</b>	<b>56.7</b>	<b>68.0</b>	<b>50.8</b>

*Source: Impact Economist*

According to the results of 2021, Ukraine took 58th place among 113 countries in Global Food Security Index (GFSI), scoring 62 points on a 100-point rating scale, which is 3.2 points higher than the previous year. The improvement of indicators is largely related to the development of agriculture, in particular, the production and research activity of international agricultural

companies. At the same time, Ukraine continues to remain at the bottom of the rating among European countries, second only to Serbia with a score of 61.4. As analysts note, food security in Ukraine has been characterized by steady growth over the past 5 years. At the same time, the category of natural resources and sustainability requires increased focus in the field of protection and quality of water resources.

Overall, the overall global index decreased from 61.6 points in 2019 to 60.9 points in 2021. As analysts note, this trend is observed in all regions, countries and groups of countries, regardless of development and income level. Over the last year, for example, Romania lost 1.4 points, Norway – 2.5. The most noticeable decline was observed in Finland – 4.3 points. The key factor in the decrease in the overall index of such countries was the significant instability of agricultural production.

Within the scope of the Index, food security is defined as a state in which people have access to food – physical, social and economic (in adequate quantities and of adequate nutritional value) at any time, which meets the requirements of the diet for a healthy and active life. The index helps measure countries' policies and the effectiveness of their institutions in the field of food security. Europe is a region that is considered a strong participant in the world economic process, second only to North America. But there is a clear gap in food security in Western and Eastern Europe, to which territory Ukraine belongs. Most Western European countries are part of the EU, so the EU's single market provides the right to duty-free trade in agricultural products within the bloc, a key factor in ensuring affordable food security for the region.

The first category of the index calculates food affordability by assessing factors that may include consumers' ability to purchase food, their vulnerability to price changes, and the availability of policies to support consumers during fluctuations. In this category, Europe is the highest rated region after North America, thanks to high incomes, low poverty levels, stable food prices, strong social safety nets and robust agricultural financing systems. Unfortunately, there are specific gaps for individual countries, especially in Ukraine. Countries should monitor indicators related to the availability of food security and master sub-national indicators to identify specific vulnerable population groups and regions.

In the Table 2, the Food Security Indices of the member states of the European Union (EU) are given, thanks to which it is possible to distinguish the most and least vulnerable EU countries from the point of view of food security by categories - financial and physical availability, quality and safety of food products. The study shows consideration of the basic groups of signs of food security in the countries of the world: degree of availability and consumption of food products; availability and sufficiency of food; level of food quality and safety.

The ranking and assessment of European countries in the global food supply in 2021 is studied in the Table 2.

*Table 2. Performance countries of Europe based on their 2021 food security score*

Country	Overall score	Regional ranking	Country	Overall score	Regional ranking
Ireland	84	1	Norway	76.0	14
Austria	81.3	2	Portugal	75.2	15
United Kingdom	81.0	3	Poland	74.9	16
Finland	80.9	4	Russia	74.8	17
Switzerland	80.4	5	Spain	73.6	18
Netherlands	79.9	6	Greece	73.3	19
France	79.1	7	Romania	72.4	20
Germany	78.7	8	Hungary	72.1	21
Sweden	77.9	9	Belarus	70.9	22
Czech Republic	77.8	10	Bulgaria	70.5	23
Denmark	76.5	11	Slovakia	68.7	24
Italy	76.4	12	Ukraine	62.0	25
Belgium	76.1	13	Serbia	61.4	26

*Source: Impact Economist*

A review of the main groups of food security indicators for Ukraine is shown in table. Among European countries, Ukraine occupies the last place during almost the entire period of calculation of the global index of food security.

The 2020 edition of the GFSI incorporated the "Natural Resources and Resilience" category into the main index. This category assesses a country's exposure to the impacts of a changing climate, alongside its susceptibility to natural resource risks and how the country is adapting to these risks, all of which impact the incidence of food insecurity in a country. The category was first introduced into the GFSI in 2017 as an adjustment factor; its increasing importance has led to it becoming a category in its own right for the first time in 2020.

Among the strong indicators of Ukraine, food security can be noted – a complex indicator used to assess the degree of favorable conditions for ensuring food security, as well as a low level of food losses. Among the main problems are the low amount of government spending on scientific research in the field of agriculture and the level of GDP per capita, which is half the world average.

One of the main challenges to food security is drastic climate change and droughts, which make agriculture a risky activity. But the use of modern technologies allows agricultural producers to get good harvests, maintaining the stability and predictability of the production of agricultural products, even in bad conditions. The latest genetics with a high level of adaptation to changes and an understanding of how to ensure the realization of its potential, digital technologies that allow control and forecasting of production, new means of protection, differentiated sowing, protection, nutrition – relentless investment in improving production methods and new technologies allow to save stability and meet the needs of agricultural producers and provide them with assistance in solving the challenges associated with ensuring the food security of the world. Ukraine's place in the global food supply is shown in the Table 3.

*Table 3. Performance Ukraine based on their 2012-2021 food security score*

Years	Affordability (economic)	Availability (physical)	Quality and safety	Natural resources & resilience	General	
	Score	Score	Score	Score	Score	Rank
<b>2012</b>	57.0	55.6	65.4	-	58.4	44
<b>2013</b>	57.4	55.2	64.7	-	58.0	47
<b>2014</b>	57.6	52.4	65.6	-	56.4	52
<b>2015</b>	57.1	48.7	63.0	-	56.1	59
<b>2016</b>	57.2	49.6	55.1	-	55.2	63
<b>2017</b>	55.7	50.2	61.0	-	54.1	63
<b>2018</b>	54.1	53.8	65.2		55.7	63
<b>2019</b>	63.9	50.0	59.6	53.0	57.1	76
<b>2020</b>	74.4	51.6	75.3	50.3	63.0	54
<b>2021</b>	73.9	51.8	71.9	49.3	62.0	58

*Source: Impact Economist*

In 2021, Ukraine took 58th place in the "affordability" category. In this category, our country received 73.9 points out of 100, compared to the average index of 66.7 points. But the countries that had the highest level of economic availability of products in 2021 were Denmark (93.1), Ireland (92.9), Finland (91.7), Great Britain (91.1) and Switzerland (91.0).

High indicators of Ukraine were noted when assessing the level of food reserves – a complex indicator that measures the physical availability of food at the expense of its supplies in kcal per capita per day and the level of food aid. In this category, the country scored 51.8 out of 100, compared to the world average of 56.7. According to the totality of all indicators, Ukraine took 74th place in this category. But the countries that had the highest level of physical availability of products in 2021 were Singapore (85.9), China (78.4), Canada (77.7), Switzerland (76.9) and Japan (75.7).

Ukraine took 55th place in the category "quality and safety of food products" (quality and safety), having received 71.9 points out of 100 possible, compared to the average indicator

in the world – 68.0. Among the countries that led in this category in 2021 were Canada (94.5), the United States (94.3), Ireland (94.0), Finland (93.8) and Denmark (93.5).

The category "Natural resources and resilience" (natural resources & resilience) assesses the country's impact on the changing climate, susceptibility to natural resource risks; and how the country adapts to these risks, which affect the level of food security in the country. This category was first introduced to the GFSI in 2017 as an adjustment factor and, given its growing importance, was first mainstreamed in 2021. In the Natural Resources and Sustainability category, Ukraine ranks 56th with a score of 49.3 out of 100, compared to the world average of 50.8. Among the countries that led in this category in 2021 were Norway (76.1), Finland (75.1), Ireland (74.1), the Czech Republic (70.9) and New Zealand (70.8).

Combining the efforts of state bodies, market players and international organizations makes it possible to achieve food security in Ukraine and the world. Ukraine continues to increase the production of agricultural products. This is largely due to the investments that have been made in the industry in recent years. Since 2010, the EBRD alone has financed more than 50 projects worth about 1 billion euros in grain cultivation, farming, infrastructure, storage, trading, etc. Understanding technologies and an intensive approach to growing crops through innovation will lead to high yields.

Regarding Ukraine, political instability and corruption risks pose a threat to food availability. That is why the country must maintain strategic transport infrastructure – for example, roads and railways, especially in rural areas. To ensure support and sufficiency to meet the needs of the population, especially in the case of adverse climatic conditions and crop failures, it is necessary to control the storage of agricultural products and the irrigation infrastructure.

Main regional results:

- Although the country has low indicators of transport infrastructure, there is room for improvement. In the transportation of food products, the operation of rail, air and port infrastructure plays a powerful role, but the country needs strong road systems that serve as a warning to improve transport connections and food availability, especially for rural and remote regions.

- The country's irrigation infrastructure lags significantly behind other European countries, which indicates the possibility of interest in investments in this area. Although irrigation needs vary from country to country, the high degree of drought risk in Ukraine indicates that irrigation is important for horticulture now and in the future.

- Low food loss increases food availability. Ukraine is just beginning its journey in the fight against food loss and waste and is actively working in this direction.

- Risks of corruption and political stability create a higher risk for product availability. Low levels of corruption contribute to effective food safety programs, and political stability ensures continued access to markets. However, in Ukraine there is a greater risk of corruption and signs of a risk of political stability.

The last category of the index measures the variety and nutritional quality of the average diet and food safety. Food quality and safety is an important issue for Ukraine, as the country has the lowest level of dietary diversity and low availability of micronutrients and quality protein, possibly due to low income and access to diverse food sources. In addition, food safety is weak, as Ukraine lacks food safety agencies and strong clean water infrastructure to ensure safe storage and consumption of perishable foods, including nutritious foods such as fruits and vegetables, leaving Ukraine behind in food standards. The state should consider the modernization of the main principles and strategies of nutrition, as well as regular supervision of nutrition,

Main regional results:

- Low diversity of diet supported by low availability of trace elements.

- Ukrainians have poor access to a variety of protein sources, not having access to essential amino acids, because not only the amount of protein, but also protein variety and quality are important. Taking into account not only the amount of protein consumed, but also the amino acids contained in protein sources, Ukraine has the lowest indicators for protein quality.

- Ukraine poorly implements food standards and is one of the countries with the lowest indicators in the category of food standards. In Ukraine, Slovakia, the Czech Republic and Romania, the governments do not have any national dietary guidelines in place that provide information on a balanced diet, nor national nutrition plans or strategies aimed at improving the nutrition of adults and children.

In addition to the three main factors above, the index assesses the impact of climate risks and natural assets that are fundamental to food security (water, land and oceans) and affect the overall picture of food security. This is used as an adjustment factor that acts as a lens through which food security can be viewed to demonstrate a change to the overall score. According to this indicator, Ukraine is in the last 26th place in the rating in Europe.

Main regional results:

- Ukraine belongs to the countries prone to floods. Floods may have a significant climate-related risk for the region, as global warming contributes to changes in precipitation patterns.
- Sea level rise means even more areas exposed to flooding. Melting glaciers are contributing to global sea-level rise, which could have devastating consequences for coastal cities that are already vulnerable to flooding.
- Ukraine is not prepared for climate change, like other regions, because it does not carry out adaptation measures (early warning systems), risk management, training and awareness raising.

Main strengths

- Public support provides a strong foundation for food security through food safety nets and access to finance.
- A strong infrastructure in the form of transport networks and grain storage is a key factor in ensuring the availability of food.
- Corruption and political stability risks are low across much of the region, allowing for more consistent access to food, especially for vulnerable households.
- Low risk of micronutrient deficiencies due to strong dietary diversity and availability of quality proteins and essential micronutrients in food systems.
- Europe is a leader in food safety due to its strong water and electricity infrastructure. existence of food safety agencies in each country of the region.
- There is a strong commitment to addressing the challenges of current and future natural resource and climate risks.

Key disadvantages

- There is a performance divide between Western and Eastern Europe on key indicators such as food standards and agricultural infrastructure.
- The agricultural sector faces the risks of rising sea levels and increased risks of drought and flooding.
- Risks to food security in some countries, including Ukraine and Serbia, are political instability and corruption.

Main regional results:

- Strong social safety nets ensure food security for vulnerable populations across Europe. Almost every country in the region has extensive food safety nets that serve as an important source of food security for vulnerable households. Ukraine is an exception because there is no food safety net and its general social assistance system does not cover the entire country, leaving some vulnerable groups food insecure.

- Although tariffs in the EU and Eastern Europe are low, they are relatively high (Switzerland and Norway) as a result of protectionist policies. EU tariffs on agricultural products for most countries are relatively low (in 2019, they are 12% on average). Most Eastern European countries outside the EU had even lower tariffs for the import of agricultural products. However, Switzerland and Norway impose very high tariffs – the highest in the world – to protect their local farmers. In 2019, Switzerland set an average tariff of 36.5% and even higher rates on dairy products and meat.

- Europe has the highest regional ranking for access to agricultural finance, with all countries offering government or multilateral financing to farmers. Of the 26 countries in the region, 22 have the highest scores in this metric, indicating deep funding. This is achieved through the existence of farmer cooperative banks, private banks and other financial institutions that provide access to agricultural credit.

- Although product prices remain stable throughout Europe, they have risen sharply in Belarus and Ukraine. In these countries, over the past year, product prices have risen by 5-8%. The sharpest increase in prices in the region was also recorded over the past four years; in Ukraine, average product prices have increased by 85% since 2015.

Food security from the point of view of the economic category, in our opinion, should be understood as the ability of the state to provide such a state of the economy in which, regardless of the conjuncture of the world markets, a stable, uninterrupted state is guaranteed. provision of vital human needs in food products available to the population, in quantities that meet the requirements of scientifically based medical standards, as well as vital interests of the individual, society and the state in the field of supplying the state with food.

But in practice, it becomes clear that the state did not always cope with its tasks in the matter of ensuring food security. At present, when the country's food security is based on purely market principles by various non-governmental organizations guided in their activities exclusively by commercial expediency, food security becomes problematic. At the same time, it should not be forgotten that ensuring food security is a socially significant matter that meets the interests of not only the individual, but also society as a whole, which is why it is necessary to define the role of the state in ensuring food security.

The Constitution of Ukraine guarantees: "A person, his life and health, honor and dignity, inviolability and security are recognized as the highest social value in Ukraine." That is why any state policy in Ukraine should be aimed at a person, at satisfying his interests, creating conditions for his full development and ensuring health.

Agriculture occupies a primary place in the economy of Ukraine, because it is not for nothing that Ukraine is called a country with a significant, or rather predominant, agricultural potential. Taking into account the specifics and features, agriculture produces food products that are indispensable for ensuring human life and is the basic basis of the development of society, determining the economic and food security of the country<sup>7</sup>.

Table 4 analyzes the consumption of basic food products in Ukraine for the years 1990-2020. In 2020, the average annual consumption of bread and bread products per capita last year decreased by 1% compared to 2019 and amounted to 96.6 kg. Ukrainians began to consume potatoes less by 1.25% (134 kg/year), eggs by 1.42% (278 kg/year), fish by 0.8% (12.4 kg/year), vegetables by 0.4% (164 kg/year). The biggest drop in consumption is observed in the fruit and berry sector – by 3.75% (to 56.5 kg/year) and sugar – by 3.47% (to 27.8 kg/year). At the same time, Ukraine began to consume more meat – by 0.37% (up to 53.8 kg/year), milk and dairy products – by 0.7% (up to 201.9 kg/year), oil – by 2.5% (12.3 kg/year)<sup>8</sup>.

The level of consumption and indicators of the sufficiency of consumption of basic food products can be considered as expressed benchmarks of the economic potential of the agricultural sector of Ukraine.

The optimal situation is considered when the actual consumption of food by a person during the year corresponds to the rational norm, the coefficient of the ratio between the actual and rational consumption is equal to one. The Ministry of Health of Ukraine, instead of the previously adopted definition "Recommended rational norms of consumption of basic food products per capita" proposes to apply the definition "Approximate set of basic food raw materials and food products of provision on average per capita of the population of Ukraine" without changing the quantitative indicators of such sets, thus leveling the function of the state in providing the population with high-

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<sup>7</sup> Антощенко В. В., Кравченко Ю. М. Сучасні тенденції виробництва та споживання молока в світі в умовах глобалізації, с. 9.

<sup>8</sup> Official website of the State Statistics Service of Ukraine.



quality food products in rational consumption rates sufficient for their vital activities. While food security research is the subject of many organizations worldwide, this effort is distinct for a number of reasons. This index is the first to examine food security comprehensively across the four internationally established dimensions. Moreover, the study looks beyond hunger to the underlying factors affecting food insecurity. Lastly, we have created a number of unique qualitative indicators, many of which relate to government policy, to capture drivers of food security which are not currently measured in any international dataset. Indicators of sufficient consumption of basic food products by the population of Ukraine per person per year are presented in the Table. 5

*Table 4. Foodstuffs consumed by households in Ukraine for 1990-2021 (per one person year; kilograms)*

Products	1990	2000	2010	2020	2021	2021 to 1990 %
Meat and meat products	68.2	32.8	52.0	53.8	53.0	77.7
Milk and dairy products	373.2	199.1	206.4	201.9	201.5	54.0
Eggs, units	272	166	290	278	272	100.0
Bread and bakery products	141.0	124.9	111.3	96.6	91.2	64.7
Potatoes	131.0	135.4	128.9	134.0	132.4	101.1
Vegetables and melons and gourds	102.5	101.7	143.5	164.0	165.9	161.9
Fruits, berries and grapes	47.4	29.3	48.0	56.5	59.0	124.5
Fish and fish products	17.5	8.4	14.5	12.4	13.2	75.4
Sugar	50.0	36.8	37.1	27.8	28.5	57.0
Sunflower-seed oil and other vegetable oils	11.6	9.4	14.8	12.3	13.6	117.2

*Source: State Statistics Service of Ukraine*

Therefore, the actual consumption of some basic types of food was at the level of rational norms, or even exceeded them. However, there is a clear tendency to replace such important dairy, meat and fish products with less expensive and high-calorie bread and bakery products and potatoes. The actual consumption of meat, dairy and fish products during the studied period was almost halved.

*Table 5. Indicators of the adequacy of consumption of basic food products by the population of Ukraine for 1990-2020*

Products	RRC, kg per year*	1990	2000	2010	2020	2021	2020 to 1990 (+/-)
Meat and meat products	80	0.85	0.41	0.65	0.67	0.66	-0.19
Milk and dairy products	380	0.98	0.52	0.54	0.53	0.53	-0.45
Eggs (units)	290	0.94	0.57	1.00	0.96	0.94	0
Bread and bread products	101	1.40	1.24	1.10	0.96	0.90	-0.5
Potatoes	124	1.06	1.09	1.04	1.08	1.07	+0.01
Vegetables and melon food crops	161	0.64	0.63	0.89	1.02	1.03	+0.39
Fruits, berries and grapes	90	0.53	0.33	0.53	0.63	0.66	+0.13
Fish and fish products	20	0.88	0.42	0.73	0.62	0.66	-0.22
Sugar	38	1.32	0.97	0.98	0.73	0.75	-0.57
Sunflower-seed oil and other vegetable oils	13	0.98	0.72	1.14	0.95	1.05	+0.07

*RRC is a rational rate of consumption (according to the terminology of the Ministry of Health of Ukraine).*

*Source: State Statistics Service of Ukraine*

The most important conditions for achieving food security are the following.

1. Food independence is a condition for ensuring food security, in which a food crisis does not occur when food supplies from abroad are curtailed (that is, a situation in which the provision of vital products to the population in accordance with physiological nutritional norms is under threat).

2. The physical availability of food implies that food should be available to every person, especially this applies to a special contingent of consumers in accordance with the adopted

standards. In our opinion, this concept of physical accessibility should be expanded by including the factors of spatial accessibility, i.e. the ability to obtain food in the places of life (development of transport, trade and social infrastructure).

3. The economic availability of food outlines the possibility of any mechanism to buy food at the established level of prices and incomes (taking into account the income of food from personal subsistence farming) or the right that allows people to receive food in the amounts included in the minimum consumer basket.

4. Compliance with sanitary and hygienic standards. Food products should not contain inclusions dangerous to human health (chemical compounds, pathogenic bacteria, viruses, genetic modifications, etc.). The products should not be expired and even more stale, they should not contain anything that would make their consumption unsuitable or even fatally dangerous for humans.

The level of self-sufficiency in food products in Ukraine in 2021 is examined in Table 6. It is worth noting that the Human Development Index (HDI) of Ukraine in 2019 reached 0.779. HDI is a statistic that combines life expectancy, education level and GDP per capita. Countries with a score above 0.700 are considered highly developed compared to countries with a lower score. The HDI indicator of Ukraine fluctuated during this period. In 1990, Ukraine's HDI of 0.705 meant that it was a highly developed country, but by 1995, this figure had dropped to 0.664. In 2019, Ukraine rose 14 positions in the Human Development Index and took 74th place. A total of 189 countries are in the rating. In the Human Development Index for the previous year, Ukraine took 88th place. The overall coefficient of Ukraine is 0.779 (out of a maximum of 1.000). According to the index, the life expectancy of Ukrainians is 72.1 years. The education index measures the average duration of education of the population, which is 11.4 years and the expected duration of education of the population is 15.1 years. The gross national income index per capita is \$13,216. It is noted that the list is headed by Norway, the second place is occupied by Ireland, and Switzerland closes the top three. The TOP-10 included Hong Kong, Iceland, Germany, Sweden, Australia, the Netherlands and Denmark.

*Table 6. The level of self-sufficiency in food products in Ukraine, 2021*

Type of products	Volume, thousand tons			Output, thousand tons	Indicator self-sufficiency
	import	export	fund of consumption		
Grain and leguminous *	377	51573	5117	5968	1,2
Meat and meat products	260	509	2191	2438	1.1
Milk and milk products	781	369	8337	8714	1.0
Fish and fish products	461	15	548	105	0.2
Eggs**	4	97	650	813	1.3
Vegetables, water-melons, melons and gourds	343	276	6866	10438	1.5
Fruits, berries and grapes	1183	355	2440	2499	1.0
Potato	252	33	5480	21356	3.9
Sugar	168	37	1181	1416	1,2
Oil (including the main oil-containing products counted as oil)	289	5547	564	5968	10.6

*\* (including grain processing products per grain)*

*\*\* For the calculation, the average weight of one egg is taken – 57.75 g*

*Source: State Statistics Service of Ukraine*

The socio-economic condition of rural areas, the main suppliers of labor to agricultural enterprises, is characterized by the existence of processes that serve the degradation of labor potential and the growth of the demographic crisis. If we consider Ukraine in terms of urbanization, the record number of the existing population was recorded in 1992 – 52.2 million inhabitants, but from the following year, a gradual decrease begins. As of January 1, 2022, the population of Ukraine is 41,167.3 thousand people, which is an increase of 421.1 thousand people less than in 2021. Estimated population of Ukraine as of February 1, 2022. was 41,130.4 thousand people. Total population reduction in January 2022. amounted to 36.9 thousand people.

Basically, it is almost impossible to eliminate threats to food security, because they are objective phenomena that indicate the cyclical nature of the development of socio-economic systems. Nevertheless, their severity can and should be reduced, if you pay attention to the peculiarities and distinguish their closeness in time. This can only be achieved through management. In general, the concept of managing the economic security of the agrarian sector is understood as such management of the agrarian sector that is suitable for preventing or mitigating situations of threats in production and economic activity, as well as keeping the functioning of the agrarian sector in a state of survival in the presence of threats and removing it from this state with minimal losses. The content of managing the economic security of enterprises in the agrarian sector is reduced to a quick and effective response to changes in the external environment on the basis of additional options for management solutions developed in advance, which provides for different actions depending on the situation. Under any economic, political and social changes in the country, the main goal of security management is to ensure stable development and state<sup>9</sup>.

Management of the agricultural sector of the economy has its own characteristics, which are related to the specifics of agricultural production in terms of overcoming security threats:

1. The external environment of enterprises in the agrarian sector is characterized by increased problems, since agro-industrial production has always been favorable to the changes taking place in it. In addition, the results of agricultural production are affected by natural and climatic conditions, which greatly complicates the management process.

2. The consequences of the implemented transformations in terms of overcoming threats can become felt after a significant period of time, this is the effect of the duration of the production cycle, which can reach several years (growing perennial plantations). Accordingly, the process of overcoming threats will last longer (more than 2 years) than in industry.

3. Management of agro-industrial complex complicates the seasonality and long-term nature of production processes in the agricultural sector, as they require significant financial resources in certain periods.

4. The processes of restructuring of land and property relations contribute to the restructuring of the intra-economic culture of agro-industrial formations, which makes it possible to create a sense of master-owner in workers, who could better dispose of the created production potential than the state has so far.

According to our research, the methodological basis for the implementation of measures to overcome threats to the agrarian sector of the economy can be: the importance of understanding by the agrarian sector of the economy the objective need for measures to overcome threats; analysis and forecasting of threats in the agricultural sector; providing the process of taking security measures with a clear strategic orientation, formulation of the ultimate goal, stages and priority mechanisms for its achievement.

With the development of any organization, there is a possibility of a threat. When the inevitability of a threat is present, it cannot be prevented or slowed down, the security management strategy focuses on the problems of defeating the threats, which is where all efforts are focused.

The search for ways to overcome threats is directly related to the elimination of the causes contributing to its occurrence. At the same time, it is recommended to carry out a thorough analysis of the external and internal environment of agribusiness and to identify factors that are important for sustainable development; collection and tracking of information on components and, having realistically assessed the situation, find out the causes of the danger. An accurate and timely analysis of the condition is the initial stage in the development of a strategy for managing the safety of agricultural sector activity. We believe that in order to identify the causes of threats at the level of an agro-industrial complex enterprise, it is first necessary to conduct a diagnosis of external factors. The obtained results should be correctly compared by combining the stages of analysis: analysis of the macro environment and analysis of the competitive environment according to five

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<sup>9</sup> Батюк Л. А., Антощенко В. В. Інноваційно-технологічні чинники глобального економічного розвитку, с. 79.

main components: buyers, suppliers, competitors in the agricultural sector, new possible competitors, substitute products.

Having information about the external environment, it is further recommended to combine it by the method of creating scenarios. In the presence of factors that are difficult to monitor, the development strategy for economic security should provide the agricultural enterprise with the opportunity to maximize competitive advantages and minimize losses.

Together with the analysis of the external environment of the enterprise, it is necessary to carry out an in-depth study of its real situation. When diagnosing the company's strategy, we consider it necessary to focus on the following aspects:

1. Effectiveness of the current strategy. At this stage, it is necessary to analyze all component strategies – distinguish the company's place among competitors, then the limits of competition (market size) and consumer groups, and finally functional strategies in the field of production, marketing, finance, personnel. Assessing each component will help to better understand the strategic state of the enterprise under threat. Moreover, the evaluation should be carried out according to such quantitative indicators as the share of the enterprise in the market, the size of the profit, the size of the loan, the size of the market, the volume of sales (increases or decreases relative to the market as a whole), etc.

2. Strengths and weaknesses of the enterprise, opportunities and threats. Today, SWOT analysis is a convenient and proven means of assessing the strategic position of an enterprise. Strength is something that helps the company prosper and includes skills, work experience, resources, achievements (higher quality products, developed technology). Weakness is the lack of something important in the functioning of the enterprise. Once strengths and weaknesses are established, they are thoroughly analyzed and evaluated. Considering the creation of the strategy, the company's strengths are important, because they will form the basis of the anti-crisis strategy. If they are not enough, the agribusiness must quickly create a basis on which this strategy will be based.

At the same time, an effective strategy for the economic security of enterprises should be aimed at eliminating weaknesses that have caused threats. Market opportunities and threats can also determine the security strategy of an agribusiness. To do this, they evaluate the possibilities of the complex, which ensure the possible profitability of the enterprise, and the threats that affect it negatively. Opportunities and threats have an impact on the state of the enterprise, but also guide what strategic changes should be. A security strategy must take into account perspectives that correspond to opportunities and protect against dangers. A significant part of the SWOT analysis is the description of the company's strengths and weaknesses, opportunities and threats, and conclusions about the need for strategic changes.

3. Competitiveness of agricultural enterprise prices and costs. It is necessary to know how the prices and costs of the enterprise are interconnected with the prices and costs of competitors, for this a strategic analysis of costs is carried out. The method by which this analysis is carried out is carried out by the "value chain" method.

The "value chain" reproduces the process of forming the value of a product or service and contains various types of activities and profits. Connections between types of activities can be a source of company advantages. Each type of activity in the chain is associated with costs, which means with the company's assets. By comparing production costs and assets with each type of activity in the "chain", the costs for each are determined. In addition, the prices and costs of the enterprise are influenced by the activities of suppliers and end consumers. When there is a need to trace the value creation process in its entirety, it is necessary to pay attention to the "value chain" of suppliers and end consumers. Although the process of separating costs for each type of activity is long and complicated, it makes it possible to better understand the structure of the company's costs. In addition, it is necessary to carry out a comparative assessment of the company's costs and the costs of competitors by main types of activities. In this way, it is possible to establish the best practice of performing the specified type of activity

and the most effective method of minimizing costs, and on the basis of the conducted analysis, start work on increasing the competitiveness of agricultural enterprises in terms of costs.

4. Assessment of the strength of the company's competitive position. Although the assessment of the competitiveness of agricultural enterprises in terms of costs is necessary, it is not enough. The strength of the company's position (weak or strong) in relation to its main competitors is characterized by such indicators as product quality, technological capabilities, the duration of the product cycle, and financial position. The assessment will help reveal the state of the enterprise compared to competitors, showing in which part it is weak or strong and in relation to which competitor.

5. Identification of problems that caused a threat to the enterprise. Managers analyze the state indicators of the agricultural enterprise at the moment of the threat and indicate what needs to be focused on. The data obtained during the study are systematized and analyzed. Diagnostics of the condition of an agricultural enterprise that is in a state of threat includes:

- formulation of strategic indicators of the company's activity: market share; the amount of profit; sales volume (decreases or increases);
- establishment of internal strengths and weaknesses, external threats and opportunities;
- distinguishing competitive changes: product qualities / characteristics; reputation; marketing; production capabilities; technological skills; financial situation; sales network; costs compared to competitors; other;
- draw conclusions about the state of the enterprise compared to competitors;
- formulation of priority strategic problems that the company needs to solve;
- revision of the mission and system of goals of the enterprise.

The next significant stage of strategic planning for safe development is changing the mission of the enterprise and the system of goals.

If the mission is an understanding of what the enterprise will be like in the future, then the system of goals (long-term and short-term) are those desired results that correspond to the understanding of the goal.

Goals are the starting point of the system of strategic planning, motivation and control used in agribusiness. They form the basis of organizational relations and assessment of work results of individual employees, divisions and the organization as a whole. Every organization has several levels of goals that form a hierarchy of goals.

Higher-level goals are long-term oriented. They help to understand how today's decisions affect long-term indicators. Lower-level goals are aimed at the short- and medium-term perspective and are a way to achieve high-level goals. The process of strategic planning for safe development ends with the definition of strategic analysis methods, the outline of strategic alternatives for overcoming threats, and the choice of a strategy. Further stages are related to the implementation of the strategy of economic security at agricultural enterprises, evaluation and control of the results.

Tactical (operational) measures for the exit of the enterprise from a state of danger can be as follows: cost reduction, reduction of personnel, reduction of production and sales volumes, modernization, identification and use of internal reserves, active marketing research, involvement of specialists, obtaining loans, strengthening discipline, etc. The structure of the enterprise largely determines the ability to respond to changes in the external environment. When an agribusiness has a too rigid organizational structure, it can prove to be an obstacle to flexible adaptation to new conditions, suspend the innovation process, and hinder the approach to solving new problems and tasks.

At the level of an agrarian enterprise, management systems help or hinder the implementation of the economic security strategy. On the one hand, in enterprises with a bureaucratic management style, the simplest decisions and costs of lower-level personnel must necessarily be supported by a higher-level manager. If a person works in such a structure for a long time, it is doubtful that he will take on additional responsibility or initiative. On the other hand, the lack of systems and documentation will lead to duplication of work done or loss of information if an employee is fired.

Different companies have their own style of management, which can fit into the company's strategy, or it can contradict it. In some cases, the preference of a single style can lead to problems. It is known that the autocratic style is useful only in such situations that require the immediate elimination of resistance or when making important changes.

Skills and resources also influence the strategy of safe development, because their correct use is crucial for the successful operation of an agribusiness. The manager must mobilize the company's resources as much as possible and distribute them for maximum effect. The mechanism of using the enterprise's resource potential must correspond to the implemented strategy. To form the necessary strategic changes, indicators are used, which would list all the evaluated criteria.

In the analysis, a different scale is used (for example, 0 points indicate that the criterion does not differ from the ideal option, and 5 points indicate that the evaluated criterion should be significantly revised). The "Options" column describes the specific actions required to achieve the desired results. Such options should be analyzed in the process of production.

The management, at the stage of implementation of the economic security management strategy, can revise the plan for the implementation of the new strategy, if the circumstances require it. The last stage of strategic management is the assessment and control of the implementation of the strategy, aimed at finding out how the implementation of the strategy leads to the achievement of the company's goals.

Based on the above, the scheme of strategic management of enterprise security and the formation of strategies of agricultural enterprises under the conditions of overcoming the consequences of the economic threat and the organization of their implementation is imagined as follows. The introduction of a security management strategy is most effective if it is combined with an adapted structure and subordinated to a balanced system of objectives. Since in critical situations there is no time left to prepare the basis for strategic changes, the management system must be changed immediately, which can have a painful effect on the work of the staff.

It is possible to overcome resistance by carrying out two groups of measures: psychological (on the basis of attitude to changes, to single out the cultural direction of different groups of personnel, limiting the influence on decision-making of those groups that do not perceive changes); system (creation of a temporary structure of the enterprise, which will help to carry out smooth changes for operational activities).

At medium-sized and small agricultural enterprises, which are characterized by a positive attitude of employees to changes, it is possible to consistently adapt the old structure, piling on its basis new project units needed for the implementation of the strategy. At large agricultural enterprises, with a negative attitude of employees to changes, it is necessary to use varieties of the so-called dual structure, when the implementation of the strategy takes place separately from operational activities. This helps managers to ensure support for change in the departments involved in its implementation. In order to quickly implement the necessary decisions, authoritative powers are used, while the classic systems of passing teams are replaced by contacts between the manager and the executors, without using some levels and hierarchies.

The subsystem of managing the economic security of the agricultural sector is based on a two-way process: "bottom-up"; "from top to bottom". This process is most vividly traced under a developed management apparatus in medium and large agricultural enterprises. When implementing the "bottom-up" organizational process, the divisions of the management apparatus perform the functions of analysis, diagnosis, control and adjustment of activities in the sub-departmental subsystem of the enterprise in order to find and overcome equivalent threatening situations. The functions of destroying local threatening situations are interdisciplinary in nature and require the joint activity of units and specialists, taking into account the interrelationship of processes and phenomena occurring at the enterprise. Therefore, the "top-down" process promotes the establishment and coordination of connections, provides assistance to subsystems,

Taking into account the above characteristics of the economic security management system, the heads of agricultural enterprises and organizations in the agricultural sector choose the most

favorable option. Four blocks of problems can be included in the concept of agricultural sector security management.

The first block – problems related to management in the phases of the cyclic manifestation of threats (problems of recognition, prevention, overcoming the threat and elimination of consequences). At each management phase, we suggest changing orientation, that is, using different management mechanisms (motivation, attitude, value orientation, etc.) and varying organizational forms: from rigidity to relaxation, informal management, etc.

The second block of problems is related to the sphere of life activity of the agricultural sector and the activity of the management object (problems of management methodology and organization, legal and social-psychological problems). We believe that they should be controlled by the management, they should be resolved taking into account such criteria of threats as type, feature, causes, possible consequences, etc.

The third block is the problems of procedural management: forecasting threats and assessing situations, preparedness for threats and predicting possible consequences, development of management solutions in conditions of threats and risky type of activity, when resisting a threat and getting out of it always require innovation and new approaches need to be developed and implemented innovative handling strategies.

The fourth block includes problems of a socio-economic nature (market behavior and employee management). We believe that the main role is played by investment planning, without which it is impossible to carry out the modernization and reconstruction of the agro-industrial complex, the search for options for behavior in the market and the selection of employees according to the criteria of the management organization.

Based on the conducted research and analysis of the material describing the state and directions of development of the country's agrarian sector, we offer the concept of anti-crisis management of the security of an agrarian sector enterprise as a methodological basis for further research into the issues of the mechanism of food security management in the agrarian sector.

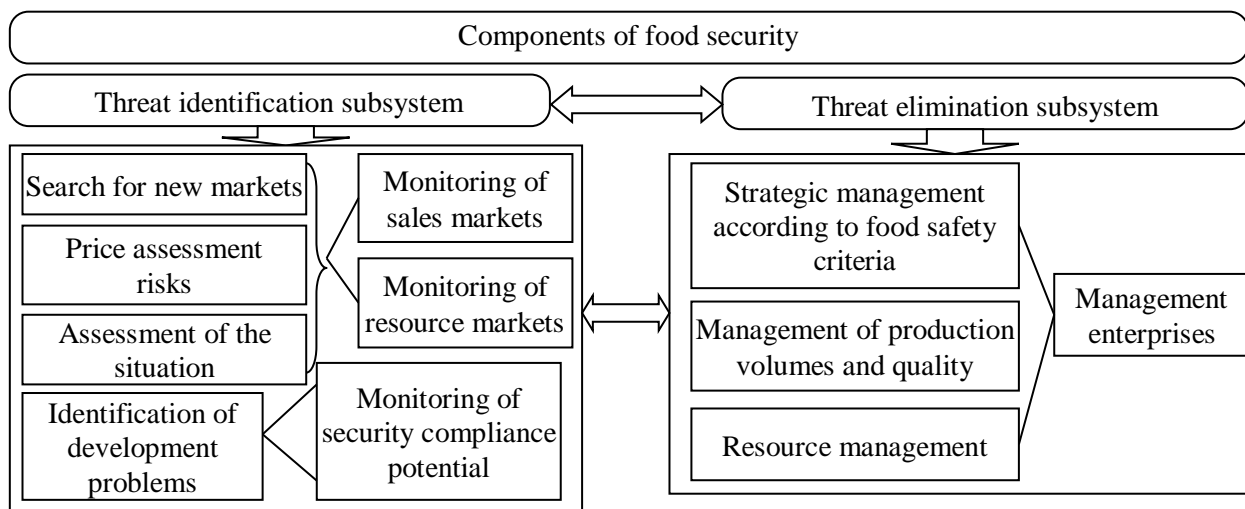
The main target criteria, which also relate to the problems of economic security management, which should ensure the transition to a qualitatively new management system in the agricultural sector, are the creation of a highly competitive management system for the agricultural sector of the economy, which must meet international standards in force in the European Union and the requirements of the World Organization trade; implementation of a model that should rationally combine state and non-state management, interacting with practical management at the level of individual industries and enterprises. In addition, it is necessary to clearly distribute functions, powers and responsibilities "vertically" and "horizontally" to activate the economic processes of production and social development of rural areas, then provide a management system for information means and technologies, which will enable the processes of preparation, adoption, implementation and correction of management decisions at various levels and areas of economic activity to be quickly and efficiently carried out. In addition, it is necessary to modernize the system of training and use of highly professional managerial personnel, applying progressive methods of evaluating and stimulating managerial work and organizing the career movement of managers and specialists, forming a modern scientific base on issues of organization and management development.

The essence of managing the economic security of enterprises in the agrarian sector is to respond quickly and effectively to changes in the external environment on the basis of previously developed alternative options for management solutions, which can be used to predict various actions depending on the situation. The main goal of security management is to ensure sustainable development and a stable situation in the face of any economic, political and social changes in the country. On the basis of the conducted research, it should be noted that the management of the economic security of enterprises in the agrarian sector should be carried out taking into account the features of the agricultural sector under transformational changes and the features of the object of management – economic security, that is, the existence of economic threats. Management of economic security, in our case, is a complex of management of threats and

economic relations in the agricultural sector, arising during the process of this management. Security management as a management system contains subsystems of two levels: the managed subsystem (management object) and the management subsystem (management subject).

Threat management is management aimed at overcoming threats, designed to predict and prevent the insolvency of agricultural enterprises and to compare the strategic program of increasing competitive advantages and financial recovery. The formed idea includes the following basic provisions: primary analysis of the causes of threats; diagnosis of the external environment and the potential of competitive advantages of an agricultural enterprise in order to be able to choose a development strategy; business planning to increase competitive advantages and financial recovery of the enterprise; development of the procedure for the financial recovery of the enterprise and the control system for their implementation.

As part of the general conceptual approach to understanding the system of economic security of enterprises and the economic system of the agrarian sector in general, the author's scientific novelty is that we made an attempt to understand the problem using the methodology of system analysis. The well-argued concept of managing the economic security of agricultural enterprises is based on the principles of controlling economically safe and dangerous states, revitalizing mechanisms, implementing tools and building a two-level management system that contains subsystems for determining the state and implementing strategies for eliminating threats (Fig. 1).



*Fig. 1 The structure of the economic security management system of agrarian enterprises*

So, the system of formation of economic security of the agrarian sector contains subsystems: functional, providing, controlling, target and regulatory.

The target subsystem embodies the main goal of economic security of the agricultural sector – sustainable development of the industry and consumption of food and raw materials. Subsystems of financial, informational, logistical, personnel and scientific support are related to the economic security of the agricultural sector.

The system of indicators of economic security of the agrarian sector is a controlling subsystem of the system of creating economic security. The management subsystem includes market mechanisms of system regulation, state management measures that make changes to the activities of market regulators in accordance with the economic security situation of the agrarian sector, in accordance with the indicators of the controlling subsystem.

The functional subsystem consists of the production of raw materials, food, the formation and distribution of resources.

According to Fig. 1, subsystems of the general system of economic security schematically consist of the following components:



1. Target subsystem (satisfaction market needs in food products; receipt by producers of goods for the reproductive cycle; increasing the competitiveness of agricultural products; ensuring social stability)

2. The supporting subsystem (resource support, methodical support, marketing support).

3. Functional subsystem (structure of production, raw materials, food; formation and distribution of resources).

4. Management subsystem (development of management decisions; state regulation of agricultural products).

The elements of the food safety compliance system are characterized by the following principles:

- resource principle – subsystems that, when performing their own target functions, are connected by resource flows to each other to provide the necessary resources for the implementation of the main goal – ensuring the economic security of the agrarian sector;

- information principle – subsystems connected by information flows in the process of ensuring the stability of both individual subsystems and the overall system of economic security of the agrarian sector;

- organizational principle – subsystems that are organizationally subordinated to each other in such a way as to ensure the achievement of the general goal in the best way;

- technological principle – subsystems connected in the process of transforming resources technologically, which are needed to achieve the intended goals of food and raw material supply;

- functional-target principle – subsystems, having target functions, help realize the general goal of the system – ensuring the economic security of the agrarian sector.

The systemic approach should have institutional features, including the leading institutions of the agricultural sector (formal and informal rules, mechanisms that ensure their implementation) and norms of behavior that bring order to repeated interactions between people. The most complete, within the framework of institutionalism, is considered how informal rules affect the economic behavior of a person.

Inflows are defined in the system of economic security of the agrarian sector by the direct use of natural resources: soil, living organisms (plants, animals, microorganisms), etc. A significant role is played by the complex of landscapes involved in agrarian cycles, meteorological and climatic conditions of agricultural production, which are determining factors in the implementation of the final effective activity in the agrarian sector. Output flows in the security system of agricultural sector enterprises are created during internal and external consumption of complex products at different stages and with different components of agricultural production. Flows are represented by products that are used within the agricultural environment (intermediate consumption) and in industries related to the use of food raw materials or determined directly by final consumption.

Coordination of the "input/output" system is a complex task of algorithmic solving, which is carried out during the assessment of effectiveness and calculation of the efficiency of agricultural production. The ratio of the volumes of "output" and "input" can be described by the coefficient of effectiveness (efficiency) of systems – which is analogous to the efficiency of a specific economic activity. At the same time, it should be taken into account that a significant number of economic systems have feedbacks – the influence of the results of the system's activity on the process of their development, which is extremely important in studies of the interaction of separate variable units of the system of economic security of the agrarian sector under the conditions of normalization of agrarian production.

The production of organic and ecologically clean products receives priority weight in the implementation of management actions aimed at compliance with food safety. At the same time, it is difficult to exaggerate the development potential of domestic commodity-producing enterprises in this direction, because long-term crisis phenomena in the agricultural economy caused a significant revision of the content and filling of technological standards, a decrease in the number of technological operations in the cultivation of agricultural crops, a change

in the order of fertilization and crop care in the direction of reduction norms for the application of mineral fertilizers and chemical protection agents, which created impartial rights of subjects of domestic agricultural production, first of all, in the field of crop production, equivalent to foreign commodity producers who have been using intensive technologies for ten years, based on the free use of chemicals. The course for the production of ecologically clean and organic products requires complex mobilization of precisely this part of the development potential, despite its creation due to the limited financial prospects of commodity-producing enterprises.

Ensuring food security determines the realization of stable socio-economic development, which determines the need to carry out the necessary innovation and investment development projects. The latter determines the attraction of investment support tools and compliance with financial and economic sustainability, because the implementation of projects for the production of organic and ecologically clean products, as well as any improvements in product or industry specialization, require investment resources. Similarly, the choice of the direction of implementation of similar projects requires orientation to the needs of consumers, which is obtained due to the addition of marketing tools to the management of agricultural enterprises in the situation of compliance with food security. It is precisely the integral use of marketing tools that allows the enterprise to rationally implement the product policy, which is based on creating an offer of its products on the market. Thus, an appropriate and responsible marketing practice helps an agricultural enterprise in the process of managing and performing its basic activities to equally respond to the threats of the institutional environment, the competitive construction of target sales markets, and take into account the potential of the consumer audience. The above helps to mediate the motives for the implementation of socially responsible and economically rational activities of commodity-producing enterprises in the situation of compliance with food safety. competitive construction of target sales markets, take into account the potential of the consumer audience. The above helps to mediate the motives for the implementation of socially responsible and economically rational activities of commodity-producing enterprises in the situation of compliance with food safety. competitive construction of target sales markets, take into account the potential of the consumer audience. The above helps to mediate the motives for the implementation of socially responsible and economically rational activities of commodity-producing enterprises in the situation of compliance with food safety. In solving the problem of ensuring economic and national security, the problem of food security for today's society is one of the main ones connected with the systemic crisis and the decline in indicators of all sectors of the economy, the growth of the global financial crisis, and the economic crisis in Ukraine.

The United Nations (FAO) and the World Health Organization define food security as the ability of citizens to have stable access to a reasonable amount of safe and nutritious food that guarantees a healthy and active life, or a system that clearly works and provides food to all segments of the population, based on the approved physiological norms, through own production and the necessary import of those products for the production of which there are no internal conditions.

V. Vlasov believes that "food security is a complex of economic, organizational, technological, social, ecological and other factors aimed at the continuous operation of the agro-industrial complex with the aim of satisfying people with various and competitive food products according to scientifically substantiated norms, forming the necessary insurance reserves and export surplus products. He admits that in case of complications in the process of production of some types of imported food, the vulnerability of food supplies should be no more than 5-8% and these should be products that cannot be produced under these natural conditions.

The Concept of Economic Security of Ukraine states that "food security" is a situation in which the country's population is protected from insufficient nutrition (especially from hunger) and the state has the necessary opportunities for this.

We assume that the scientifically correct definition of the term "food security" is the following: "food security" is the ability of the domestic agricultural industry to produce and

supply to the domestic market and to the state reserves food products and resources of the required assortment, sufficient volume and required quality, taking into account the social composition of the population and the actual level of incomes that provide their physical and economic availability and food independence of the country. Food security is a state of connected systems of production, preservation and distribution of basic food products, which, by means of weighing the uniqueness of the use of natural resources and productive forces, in its combination is capable of continuing the cycles of reproduction of agricultural products, despite emerging internal and external threats and socially - economic condition, to ensure the economic endurance of systems and the balance of their development, relative economic independence, a satisfactory degree of consumption of vitally important quality food products, which guarantees the needs of a healthy and active lifestyle, meets the recommended balanced standards of the diet and the volume of consumption with the physical and economic availability of food for all strata of the population.

In our opinion, the category "food security" should be considered as a complex of socio-economic relations that are manifested in order to provide all its members with food, the appropriate standards in terms of quality and quantity, based on the innovative development of restorative processes in agriculture and ensuring the economic security of the agrofood sector. At the same time, the problem of ensuring economic and food security by the state is combined with the problems of innovative development of reproductive processes in the regions and directly in agricultural enterprises, individual peasant farms.

The interests of the state in the sphere of ensuring economic and food security are reduced to ensuring the access of population groups to a sufficient amount of food products. The main principles for solving this problem by the state are the availability and provision of basic types of food, sustainability of production, efficiency in the use of land, production, and labor resources, availability of food products for all population groups, protection of the agrofood sector of the economy from external and internal threats. From this it follows that the availability of food consists in ensuring the production of its main types in the regions, the creation of reserves or imports. The principle of availability is closely combined with the principle of stability, so the population's need for food is constantly present every day. Stability, in turn, it is closely related to the efficiency of direct use of land, production, and labor resources by food producers. In agriculture, in the conditions of the economic crisis, in order to increase production efficiency and competitiveness, a priority role in the production process, its transition to an innovative path of development, taking into account regional and local conditions.

The availability of food products for all population groups is determined by the state of processing, storage and canning, trade networks and markets, which also affects the quality, safety and balance of food. Defense against external and internal threats to the agri-food sector of the economy under the conditions of its criminalization, increase in import dependence, decrease in the purchasing power of the population becomes particularly significant and is a mandatory basic part of food security and security of the reproductive process in agriculture. That is why, as part of economic security, it is necessary to single out such integral components as food security, security of the agrofood sector, security of the reproductive process.

The ten-year anniversary of the Global Food Security Index (GFSI) allows us to look back over the past decade of data to inform action towards the UN Sustainable Development Goal of reaching zero hunger by 2030. This past decade has shown how important it is to look at hunger from a food-systems approach. This involves weighing up the affordability, availability, quality and safety of food, as well as assessing how resilient nations are in protecting their natural resources to enable them to keep producing food now and in the future.

**Conclusions.** The world needs not only more food, but also healthier, more nutritious and produced in ways that are safe for the planet. And therefore, work on innovative integrated solutions that will contribute to the overall improvement of food security in the future is the basis of the economic policy of every state. One of the most urgent challenges of modern agriculture, which has a serious impact on global food security, is drastic climate change and the threat of military conflicts. The consequences of climate change can be prevented by using modern

technologies that allow agricultural producers to obtain stable harvests, maintaining the predictability of agricultural production even in difficult climatic conditions. But military conflicts, a difficult political situation, conducting hostilities disrupts seed companies and leads to a complete destabilization of the global food supply. In order to minimize the manifestations of the global food crisis, it is necessary to protect and support the production of agricultural products in Ukraine as soon as possible in the conditions of martial law, taking advantage of the opportunities of Ukraine's influence on global food policy, which it gained thanks to achieving leading positions on the world markets of certain types of agricultural products, as well as intensifying cooperation with international and intergovernmental organizations, in particular FAO, regarding the transformation of food systems. It is necessary to restore in Ukrainians the feeling of a master, whose fundamental features are high spiritual and moral qualities, responsibility not only for one's family, but first of all for one's country, which is a priority and important not only today, but also tomorrow. It is practically impossible to eliminate threats to food security, because they are objective phenomena that indicate the cyclical nature of the development of socio-economic systems. Nevertheless, their severity can and should be reduced, if you pay attention to the peculiarities and distinguish their closeness in time. This can only be achieved through effective management. The words of Metropolitan Andrey Sheptytskyi are now more relevant and painful for Ukraine than ever: "Let the future generation take into their own hands fishing and trade, because a poor people is a nation that does not have its own fishing, and its trade is conducted by foreigners."

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