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ORGANISATIONAL AND ECONOMIC SUPPORT FOR FOOD SECURITY IN THE CONTEXT OF EXTRAORDINARY CHALLENGES

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Abstract. The theoretical and methodological basis of the research presented in the scientific paper is based on the solution of the problem of the effective functioning of the market environment, agricultural market infrastructure in Ukraine, problems and prospects that Ukrainian agrarian modernity has today in the development of global food markets. An important block of issues is also the role of the state in building new mechanisms of restrictions and incentives, implementation of the whole set of regulatory policies during the war in the context of global political, economic, food and financial challenges. The *purpose* of the study is to improve scientific approaches and practical recommendations for solving the problem of ensuring the organisational and economic foundations of the functioning of the agrarian market in Ukraine under martial law. In order to achieve this goal, a wide range of research methods was used, the most important of which were the methods of generalisation and synthesis, scientific abstraction, analytical diagnostics, descriptive statistics. The methodical basis of the research were general and special methods, namely: system analysis – in order to comprehensively characterise the strategic potential of agricultural development; statistical analysis (method of standard deviation) of the dynamics of gross production by main types of agricultural products, generalisation and synthesis – in order to examine the legislative and regulatory bases in the direction of diagnosis of the potential of the agricultural sector to ensure the sustainability of national food security. The dialectical method of understanding socio-economic processes, the formal-logical method and the method of system analysis have been applied in order to better understand the processes of the country's food supply, the formation of food independence from imports, the identification of the regularities of the processes of food self-sufficiency, as well as to take into account the influence of macroeconomic factors on the improvement of the level of national food supply and food security. The main set of indicators and factors (conditions) of national food security and the set of indicators of national food security were formed to address important issues of food supply in accordance with the country's potential capabilities in the production, storage, processing of agricultural products to provide food for all categories of the population with appropriate levels of consumption, as well as food of adequate quality and safety. The *study determines* that the economic focus of regulatory measures on the food sector, on the protection of domestic consumers, will lead to the provision of agricultural producers with the necessary and optimal level of income, and will help to increase the competitiveness of the agricultural sector as a whole. It has been proved that solving the problem of improving the organisational and economic foundations of functioning of the agrarian market of Ukraine under martial law will generally contribute to ensuring the level of national food security, which will further give a powerful impetus to the State-building in Ukraine under martial law.

Keywords: national economy, agrarian market, national food security, agro-industrial complex, food security indicator, food self-sufficiency, food independence.

JEL Classification: O50, Q11, Q12, Q13, Q17, Q18, F52, H56

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1. Introduction

The functioning of the Ukrainian economy and sectors of the economic complex, including agriculture, depends on external and internal factors. However, the war undoubtedly creates the most critical conditions for the development of the state. Martial law imposes critical restrictions on the functioning of labour markets, capital, services, migration of labour resources, balance of supply and demand in sectoral markets and, above all, ensuring food security.

A country's food security is an integral part of its national security. Improving the supply of food to the population is an important socio-economic task, the solution to which is of great importance for any country. Ensuring food security is the most important area of intergovernmental cooperation because it involves a wide range of national, economic, social, demographic and environmental factors.

The importance of understanding the role and significance of food security is confirmed by the fact that it is a necessary condition and a basic parameter of human life. The level of food consumption by the population characterises the level of economic development of the country as a whole, since it is known that sufficient food production was, is and will be the first condition for the effective operation of direct producers in particular and any production in general. It should also be noted that the level of food supply is perceived as the most important factor and determining criterion for the quality of life of the population, the viability of the macroeconomic structure and the state system of each country.

The main goal of ensuring food security in Ukraine is to ensure the reliable supply of basic food to the entire population through uninterrupted production, with the mandatory condition of physical and economic accessibility of food in the quantity and quality necessary for human life, with the maximum possible independence from external sources of food supply.

The role of state regulation in the future development of the food market is crucial, since its inherent natural and economic factors, instability and high social importance require urgent coordination of market relations, especially in the conditions of martial law.

Ensuring the country's food security determines the general trends of the state's domestic and foreign policy, social stability in society, solving the demographic problem and improving the quality of life of the population. Domestic and foreign scientific opinion has accumulated considerable experience in solving the problems of supplying the country's population with food, both at the expense of the country's own production and by increasing the import potential.

At the same time, the dynamic changes in economic conditions associated with the opening of European markets to Ukraine and the growing level of competition in the domestic food market make it more important to identify problematic aspects and areas for improving food security.

Both foreign and domestic researchers are engaged in monitoring food security indicators. Over the past five years, a large number of scientific papers on food security indicators in Ukraine have been published in the public domain. However, only a few authors have analysed most of the food security indicators at the national level. Other authors, namely A. Dibrova, Y. Lupenko, O. Pavlenko, M. Pugachov, I. Hryshova, N. Chorna, E. Kireeva, S. Kvasha, A. Poltorak, G. Penchuk, O. Kochetkov, O. Zghurska, R. Dymenko, S. Kubiv, A. Tarasiuk, Y. Safonov, V. Vakulenko observe the dynamics of consumption of basic food products.

The issue of food security occupies an important place in the concepts of national security of most developed countries, and a significant contribution to the study of mechanisms for ensuring food security in foreign countries has been made by well-known foreign scientists, such as Ahmed S., Ahrens D., Arunraj N., Broek N. T., Boqvist S., Gordon L., Söderqvist K., and Vågsholm I., Ghani M., Cozzolino C. A., Castelli G., and Farris S., Gounden C., Irvine J. M., and Wood R. J., Johnson L. K., Dunning R. K., Bloom J. D., Gunter C. C., Boyette M. D., and Creamer N. G., Jurgilevich A., Birge T., Kentala-Lehtonen J., Korhonen-Kurki K., Pietikäinen J., Saikku L., Manning L., Soon J. M., Nychas G. J. E., Panagou E., Mohareb F. R., Rockström J., Williams J., Daily G., Noble A., and Matthews N. N.

2. Materials and Methods

The methodological basis of the study was the general scientific and special methods, namely: system analysis – for the purpose of a comprehensive characterisation of the strategic potential of agricultural development; statistical analysis (standard deviation method) of the dynamics of gross production of the main types of agricultural products, generalisation and synthesis – for the purpose of studying the legislative and regulatory framework in the direction of diagnosing the potential of the agricultural sector to ensure the sustainability of national food security. The dialectical method of cognition of socio-economic processes, the formal logical method and the method of system analysis are used to better understand the processes of providing the country with food, forming food independence from imports, identifying patterns of self-sufficiency in food supplies, as well as taking into account the impact of macroeconomic factors on improving the level of national food supply and food security.

3. Results and Discussion

Recent global socio-political and geopolitical events, including the Russia's military aggression against Ukraine, require the resolution of a significant number of organisational and economic issues of crucial importance to individual states and the world as a whole. Among all aspects of Ukrainian society, challenges at the intersection of military, social and food security blocks stand out. It is worth noting that states need to pay great attention to these aspects, as the issues of livelihood for any individual, regardless of age, gender, sphere of activity, including soldiers, are inextricably linked to food security and nutrition.

The state regulatory mechanisms developed in previous years, based on market economy mechanisms, already require careful adjustment or even reconsideration in the current conditions. The historical legacy of state regulation of the agricultural sector of the Ukrainian economy is based on the key levers of the transition from a planned to a market economy.

Domestic agrarian economics has made a significant contribution to the development of instruments for restricting, stimulating and supporting national agricultural producers. In recent years, in the field of regulation of foreign economic activity, regulations have been developed on the basis of WTO requirements, Ukraine's commitments in implementing key concepts of the Deep and Comprehensive Free Trade Area (DCFTA), based on the basic requirements for the use of regulatory tools for export-import operations in the agricultural sector.

In the current conditions of the market economy, priority is given to ensuring the full functioning of the enterprises of the agro-industrial complex, in particular by satisfying the demand for imported goods and products. Special attention of the Government is paid to the creation and approval of a list of critical import goods necessary for the uninterrupted operation of the enterprises of the agro-industrial complex and for the satisfaction of the population's food needs. In this context, a list of critical import goods has been approved, and continuous weekly monitoring of the needs of the agro-industrial complex enterprises for critical import goods is carried out.

In order to assess the state of food security, Ukrainians need to learn from the experience of many economically developed countries, especially their closest European neighbours. As is known, the Common Agricultural Policy (CAP) is the main instrument of EU agricultural support policy, consisting of two components – market support and direct payments, as well as measures for rural development (CAP, 2023; The European Commission, 2024a; The European Commission, 2024b). In EU member states, the level of support reaches up to 20% of the value of agricultural production, according to the methodology of the Organisation for Economic Co-operation and Development (OECD). In the previous period, from 2014 to 2020, total support for agricultural producers and rural areas amounted to at least 40 billion EUR. During these years, the largest expenditure programme was direct support payments to farmers – 257 billion EUR, or 63% of total expenditure (OECD, 2024).

In response to WTO challenges, the specifics of farm support for the purposes of modern agricultural policy in the United States are primarily associated with the elimination of direct financial payments to agricultural producers. Instead, farmers are offered more flexible financial support instruments through production risk insurance. In recent years, the level of support for agricultural production in the United States, according to the OECD methodology, has amounted to 10% of the value of agricultural production, reaching 489 billion USD from 2014 to 2018 (WTO, 2024).

It is worth noting that, according to the State Customs Service of Ukraine, as of mid-June 2021 and during 2022, Ukraine exported 47.7 million tonnes of grains and pulses in pre-war and war conditions. In terms of crops, the following were exported during this marketing period: wheat – 18.6 million tonnes, including 42 thousand tonnes in June; barley – 5.7 million tonnes, including 15 thousand tonnes in June; rye – 161.5 thousand tonnes (not shipped in June); corn – 22.87 million tonnes, including 553 thousand tonnes in June (The State Customs Service of Ukraine, 2024).

It is well known that the development of grain farming is a priority among agricultural sectors, which is determined by favourable conditions for grain production, the creation of a complete feed base for livestock, and the traditional importance of bread in the diet of the majority of the world's population. In 1990, Ukraine produced 51.1 million tonnes of grains and pulses, including 4.7 million tonnes of corn. As of 2020, despite a smaller area of agricultural land (the occupied lands of the Autonomous Republic of Crimea), the total grain harvest reached almost 65 million tonnes, including 30.2 million tonnes of corn.

The introduction of modern technologies has enabled Ukrainian agriculture to increase production volumes many times over. Given that domestic consumption of wheat was insignificant – 5.6 million tonnes – the country's annual export potential gradually approached 40 million tonnes of grain. The income from grain exports was used by business structures to modernise production technology, increase the area of leased land, raise wages and improve the welfare of business owners. The expansion of grain production will be ensured by: increasing the cultivation of winter grain crops using intensive technologies and

implementing a scientifically based crop management system.

In the 2020s, the largest importers of Ukrainian food products were Asian countries, led by China, followed by EU member states. As for individual commodity groups, as of 2020, the largest shares in Ukrainian exports were (in descending order): sunflower oil – 5.3 billion USD, corn – 4.8 billion USD, wheat – 3.6 billion USD, sunflower cake and solid residues – 3.6 billion USD, rapeseed – 1 billion USD, barley – 800 million USD, soybeans – 700 million USD, meat and poultry offal – 500 million USD (Figure 1).

In total, 11.9 billion USD worth of plant-based products were sold on international markets. Domestic fats and oils of animal and vegetable origin were purchased by other countries for 5.7 billion USD. Trade in food products brought Ukraine 3.4 billion USD. Ukrainian live animals and products of animal origin were exported for 1.2 billion USD.

The methodological basis for the development of the strategic development programme for the agricultural sector of the Ukrainian economy before martial law was based on the management toolkit of the agricultural sector in the United States, the EU and other countries. Recently, Ukraine has developed a number of strategies and programmes for the development of the national economy and industry until 2030. These include the National Economic Strategy for the period up to 2030, the Concept of the State Target Programme for the Development of the Agricultural Sector of the Economy for the period up to 2022, the Order of the Cabinet of Ministers of Ukraine "On Approval of the Strategy for the Development of Irrigation and Drainage in Ukraine for the Period up to 2030" of August 14, 2019, No. 688-r, the Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of Rural Development" of September 23, 2015, No. 995-r, the Order of the Cabinet of Ministers of Ukraine "On Approval of the Action Plan for the Implementation of the Concept of Rural Development" of July 19, 2017, No. 489-r.

The most important issues of national food security in the pre-war period were shaped by three main factors:

– Demographic growth of the population in the world as a whole and in certain regions;
– climate change and its impact on technological processes in agricultural production (primarily in crop production);
– rising food costs, taking into account the impact of logistics and transport costs.

These and other factors create significant differences in the national food security chains of individual countries, their political and/or economic blocs. It is clear that every country in the world has its own specific food supply characteristics, ranging from net importers to net exporters. However, the process of forming a country's food security is extremely complex, as it is linked to many exogenous and endogenous factors of national social, economic and environmental policies. Therefore, it is important to provide specific regulatory mechanisms to address all components of the national food security problem, especially those exacerbated during martial law.

For Ukraine, the main strategic features of ensuring food security before the pre-war period (2022) were as follows:

– Sufficient land resources for the production of almost the entire range of food products, which ensures physical access to the food basket through domestic production;
– stability of the population in the country, even some decrease in the population in the context of

Figure 1. Geographical structure of Ukrainian food exports, 2020

Source: compiled by the authors based on Jurgilevich et al. (2016), Zghurska et al. (2022)

sustainable food supply throughout the year in different climatic conditions and throughout the territory;
– high-tech production of food by enterprises and the country's rural population, ensuring the availability of food for all segments of the population in their place of residence;
– proper quality and safety of food products for traditional cooking and consumption by the population of Ukraine;
– economic access to food through the diversity and convenience of the agricultural market infrastructure.

Under these conditions, food security in Ukraine was achieved through domestic production of the required amount of agricultural products of plant and animal origin, i.e., self-sufficiency in food, which implies meeting the necessary food needs of the country's population through domestic production with minimal dependence on external factors, namely imports.

Summarising the statements of well-known scientists, experts and government officials, it is worth noting that by the end of 2021, the next trend in the sustainable development of the agricultural sector included six main blocks:

The first block concerns the implementation of an effective stimulating state policy;
– the second block includes initiatives aimed at improving the quality of integrated infrastructure;
– the third block is the creation of accessible material and technical resources;
– the fourth block covers initiatives aimed at balancing supply and demand in the agricultural market;
– the fifth block includes initiatives aimed at increasing full recycling;
– the sixth block involves the development of the sales ecosystem.

The agrarian market can be defined as a part of the commodity market where the objects of exchange are agricultural, fishery and forestry products, food, as well as means of production, including land resources used in the production process in the agro-industrial complex (AIC), the effective functioning of which provides the population with food of proper quality and safety (Kvasha, 2022).

Given the above, it is worth noting that currently in Ukraine, due to the specifics of the formation of market mechanisms for the functioning of the agricultural sector, there is a need to distinguish a group of food markets by the conditions of supply and demand formation, regulation, state control and microeconomic characteristics (Kvasha, 2024):
– The first group includes markets in which aggregate supply exceeds aggregate demand, and the state, due to the lack of the necessary resource base, is unable to regulate in a timely manner through financial and commodity interventions. Such markets include the grain market, the sunflower seed market, the oil market, the sugar market and, to some extent, the milk market. These markets show signs of oligopoly and even monopoly in terms of product distribution channels, which is a national feature, especially in the oil market. In the classical sense, this type of market is mainly regulated by the state and supranational bodies through administrative, legal and economic measures. In fact, in Ukraine today, these are markets with monopolistic pricing and antitrust control, although the latter cannot be considered effective. One of these areas is the regulation of prices and incomes through the mechanism of intervention policy, as well as the balancing of supply and demand, in the context of which it is necessary to "remove" the maximum amount of grain from the market through the active use of financial interventions of the Agrarian Fund and stimulate export activity by removing export duties to balance the market equilibrium;
– the second group – markets formed under conditions of market equilibrium – are types of markets where trade in goods and services takes place between many independent producers, none of whom produces the majority of the output and therefore cannot influence prices. Such a market in Ukraine today is the self-regulated potato market, where there is a clear balance of supply and demand, i.e., pricing is based on market laws. The state, as a market regulator, does not have any influence on the potato market unless there is a need to do so;
– the third group includes markets characterised by a supply deficit – domestic demand is not satisfied by the products of domestic enterprises, such as the meat, wine, flower, tea, coffee and, in certain marketing years, the milk market. This segment of the agricultural market is characterised by monopolies, oligopolies and elements of both free and regulated markets, combined with territorial and regional peculiarities. These markets periodically experience anti-market situations, especially in the purchase of products from the direct producer. This type of market is particularly complex in terms of regulatory organisation using intervention methods, due to the specificity of production. Therefore, the state should use instruments to stimulate its own production with a balanced volume of imports of a certain quantity of quality products.

It is also worth noting that the infrastructure in Ukraine consists of exchanges, rural collection points, urban wholesale and retail markets, trade structured by volume, cattle auctions, an information-marketing network and a state monitoring system. In this respect, one of the most important tasks today is the creation of a network of wholesale markets for agricultural products to ensure direct trade between producers and consumers. Undoubtedly, such a model of market mechanism construction is aimed at the optimal formation of prices for

agricultural products based on supply and demand (Arunraj, 2015).

According to the forecasts of key state programmes for the development of the agricultural market in peacetime, Ukraine's agricultural sector had the potential to supply food to some countries of the world. Experts estimate that in peacetime, the share of the agricultural sector in the overall GDP structure could increase from the current 20 billion USD to almost 80 billion USD by 2030, while the total exports of the sector will triple to more than 50 billion USD. Based on biological observations and expert economic assessments, the forecast for this year's harvest of grains, pulses and oilseeds in Ukraine shows a trend towards 50 million tonnes, with potential exports of around 30 million tonnes (Kvasha, 2017).

It is expected that the gross harvest of maize in the unoccupied and non-hostile regions of Ukraine will reach 24 million tonnes, wheat – 18–20 million tonnes and barley – about 5 million tonnes. According to the Ministry of Agrarian Policy and Food of Ukraine, estimates of scientific institutions and public organisations, there are grounds for adjusting the previous forecast of an increase in maize production in Ukraine in the next marketing year 2022/23 by 5.5 million tonnes, reaching a production volume of 25 million tonnes, taking into account the occupied territories (The Ministry of Agrarian Policy and Food of Ukraine, 2024). In addition, USDA analysts have maintained the indicators of Ukrainian grain exports for the current year in the amount of 9 million tonnes.

The volume of transitional stocks for the current marketing year 2021–2022 is around 20 million tonnes, taking into account the possible increase to 30 million tonnes for the next marketing year. In terms of transport logistics, ports will have to be ready to export almost 50 million tonnes of cereals. This means an extreme workload for all three main modes of transport – road, rail and water. In order to realise such volumes, it is necessary to ensure transport within Ukraine and beyond its borders of at least 4 million tonnes per month.

Military actions in the waters of the Dnipro and Black Sea ports since February have hampered grain exports, creating global and regional food security concerns. Ukraine's agricultural business community is concerned that failure to unblock the Black and Azov Sea ports before the start of the new harvest could result in grain remaining in the fields. Given the shortage of elevator capacities, the method of temporary grain storage using mobile grain bags – silos (polymer sleeves) – is still relevant, as it has been tested by farmers in previous years. According to preliminary estimates, in October 2022, agricultural producers may face a shortage of storage space for storing a total volume of about 10–15 million tonnes of crops.

Over the past few years, Ukraine's agricultural sector has demonstrated steady growth in production of major commodities, especially in crop production across all categories of farms. This has helped to increase food exports to foreign markets. Thus, in 2020/21 marketing year, exports of grains and pulses reached 44.6 million tonnes, including 16.6 million tonnes of wheat, 4.2 million tonnes of barley, 17.1 thousand tonnes of rye, 23.1 million tonnes of corn, and 126.9 thousand tonnes of flour. This upward trend continued at the beginning of the new marketing year and lasted until February 2022. As of June 17, 2022, Ukraine exported 47.8 mln tonnes of grains and pulses in 2021/22 marketing year, up 10% year-on-year. Wheat exports totalled 18.65 million tonnes, up 15% year-on-year. Exports of other grains also increased – barley by 5.7 million tonnes, up 38% year-on-year, and rye by 161.5 thousand tonnes, up 12.5 thousand tonnes year-on-year. Similarly, corn exports reached 22.9 million tonnes. The intensification of the export infrastructure in the autumn and winter of 2021 led to a 3% year-on-year increase in exports.

The potential ability to perform the classical functions of the agricultural market as a whole and its individual segments depends on the types of markets that have been formed under the influence of the respective supply and demand balance and the position of the state, as well as the latter's ability to regulate them. Economic theory distinguishes between monopolistic, free market (pure competition), oligopolistic and regulated markets. In the classical sense, agricultural and food markets are considered highly competitive, but in practice this is not entirely true, as there are national peculiarities of development and regulation of agricultural and food markets that form different types of markets according to their level of development (as is the case in Ukraine today), "due to" imperfect and untimely state regulation, inefficiency of relevant institutions and mechanisms.

The main task of the agro-industrial complex, especially of agriculture, is to provide the population of the country with quality food in accordance with scientifically established nutritional standards, to increase export potential, and to improve its efficiency and competitiveness (Kvasha, 2023). Therefore, food security is a level of food supply that ensures social, economic and political stability in society, sustainable and quality development of the nation, families, individuals, as well as sustainable development of the state. Food is essential for human life and development. In this context, food security should be defined as the process of developing and implementing a set of scientific, methodological, political, legal, socio-economic, environmental, information, communication and organisational measures aimed at shaping the food security of the state (Jurgilevich, 2016). The criterion for food security is

the critical (threshold) value of an indicator, i.e., the limit above which the food situation in the country (region) is considered to be dangerous. Threats to food security are any negative changes in external and internal environmental factors that reduce the level of food security (Johnson, 2018).

The issue of food security in Ukraine is an area of state policy that embodies the main directions of ensuring sustainable socio-economic development of society, as well as national and economic security. The state food security is formed according to the criteria of quantity sufficiency, affordability and quality safety. Sufficiency of food consumption is defined as the ratio of the actual level of consumption of basic food products per person to the scientifically established norms of healthy nutrition. This indicator should not be less than 60 % for the main food products, including dairy and meat products. Affordability of food consumption should be understood as the ratio of the cost of an annual set of food products per person, meeting scientifically established norms of healthy nutrition, to the annual income per person. The share of food imports in total food consumption affects the level of food self-sufficiency.

Therefore, the strategy for the development of the agricultural sector should be aimed at ensuring full food security through domestic production, increasing the volume of production to a level that will provide the Ukrainian population with food products at the level of physiological norms, significantly improving the quality of agricultural products, reducing their costs, increasing labour productivity, and increasing the profitability and competitiveness of the industry.

It should be noted that the current and strategic level of food security determines the socio-economic and ecological state of the country, in which all its citizens have a stable and guaranteed supply of food in the required quantity, assortment and appropriate quality. Ukraine's food independence is formed by domestic production of basic food products in volumes not less than the established limit of their specific weight in the raw material resources of the domestic food market.

Appropriate food security indicators will be used to quantitatively and qualitatively characterise the state of food security, the dynamics and prospects of the physical and economic availability of food products for all social and demographic groups of the population, the level and structure of their consumption, the quality and safety of food, the sustainability and degree of independence of the domestic food market (Godfray, 2020).

Food security indicators are considered as quantitative and qualitative characteristics of the state of the food market in the country. An important aspect of the analysis of this state is also the study of the dynamics and prospects of physical and economic availability of food for all socio-demographic groups of the population, the level and structure of their consumption, food quality and safety, stability and degree of independence of the domestic food market, the level of development of the agricultural sector and related sectors of the economy. Another important aspect is the assessment of Ukraine's absolute and relative advantages in terms of the efficiency of the use of agricultural natural resource potential. Therefore, the authors propose to consider the state of food security in Ukraine on the basis of the following indicators, which are presented below.

INDICATOR 1. This indicator refers to the availability of a sufficient quantity of cereals in state reserves. On the one hand, it refers to the State Reserve of Ukraine, whose function is to purchase and store a certain amount of grain designated by the government for food security in case of emergencies such as military conflicts, natural disasters and others. On the other hand, it includes the Agricultural Fund, which operates through commodity and financial interventions to support producers and ensure price regulation in the agricultural market of Ukraine, according to the legislatively established indicator of the sufficiency of stocks of objects of state price regulation, which is about 20% (Kvasha, 2024).

– INDICATOR 2. Daily energy value of the human diet, kcal. Estimated daily calorie intake required to maintain energy balance for different gender and age groups at three different levels of physical activity. The threshold value is 2500 kcal (Kvasha, 2023).

INDICATOR 3. Sufficiency of consumption of a particular product.

INDICATOR 4. Economic affordability of food as a stable opportunity for all social and demographic groups to purchase basic foodstuffs at prices, in volumes, assortment and of adequate quality necessary to ensure a rational diet.

INDICATOR 5. Differentiation of food costs by social groups.

INDICATOR 6. Domestic market capacity of individual products.

INDICATOR 7. Food independence for individual products (Kvasha, 2024).

Physical accessibility of food implies the constant availability of food in the required quantity, assortment and appropriate quality necessary for a rational diet for all social and demographic groups of the population in the places of consumption. The threshold values of food security indicators for the calorie intake of Ukrainian citizens are approximately 2500 kcal, while in developed countries it ranges from 3300 to 3800 kcal.

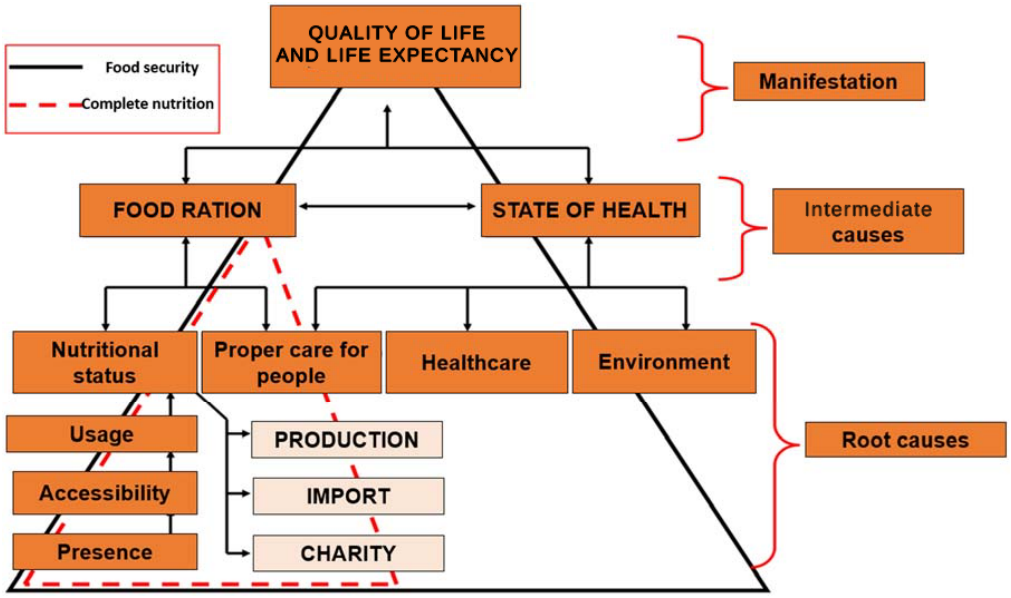

Figure 2. General scheme of building a household food security model according to FAO recommendations
Source: compiled by the authors based on FAO (2022a) and FAO (2022b).

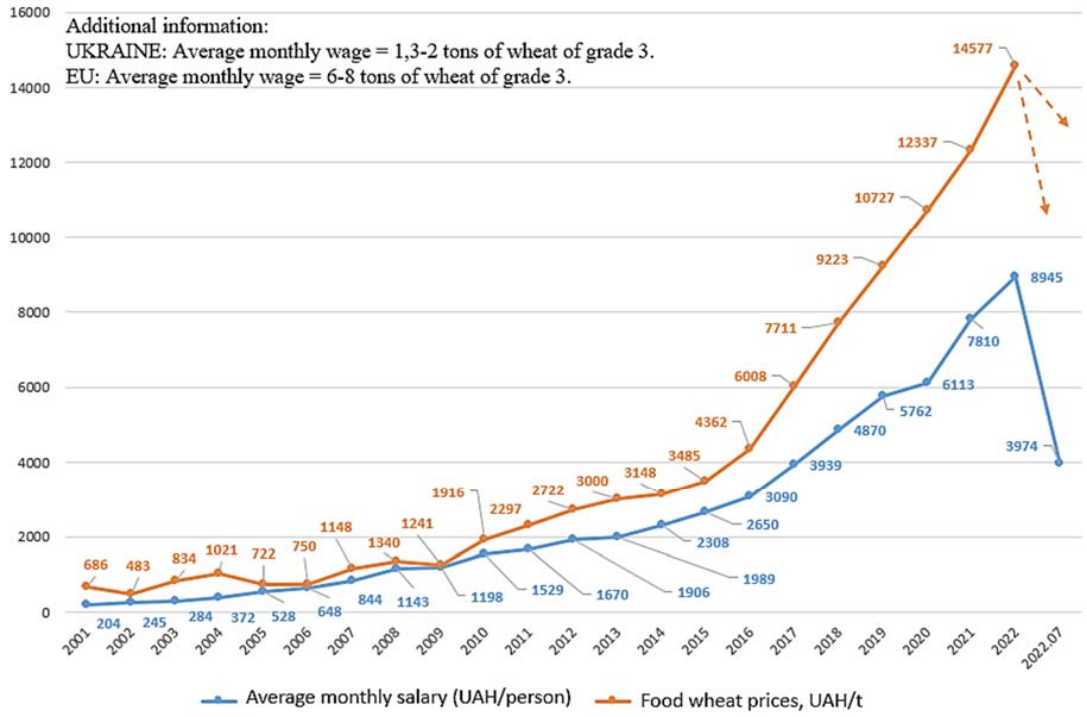

Figure 3. Dynamics of grain prices and incomes in Ukraine in 2001–2022

Source: calculated and compiled by the authors on the basis of the State Statistics Service of Ukraine, 2024; The Ministry of Agrarian Policy and Food of Ukraine, 2024

In times of war, the creation of sufficient conditions for the production of agricultural products and food is crucial for the fulfilment of the key task of any state – to ensure the stable and guaranteed supply of all citizens with safe and high-quality food in the required quantities. The central executive body, public organisations and business entities in the conditions of war must form a unified mechanism for the interaction of market participants for the formation of physical accessibility to food.

In essence, it is necessary to coordinate the organisational and managerial, financial and economic, and transport and infrastructure components of their interaction, from the movement of products, firstly,

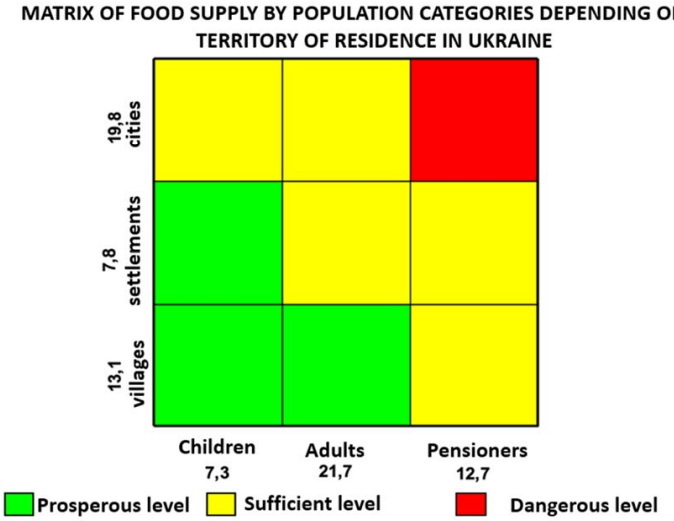

Figure 4. Matrix of food supply by population categories depending on administrative and territorial location

Source: authors' own development

from the field to the consumer's table, secondly, from the field to the processing enterprises, and thirdly, from the field to the customs border. It is not only a question of the physical and economic accessibility of food for all population groups, including those displaced within the territory of Ukraine, but also of the problem of the state's food independence, the dynamic development of all sectors of the state agricultural sector, maintaining the stability of the domestic food market, and issues related to the quality and safety of food products and healthy nutrition.

4. Conclusions

In the current circumstances, state regulation is aimed at filling the domestic market with domestically produced goods and ensuring the overall demand for food through partial import of critical foodstuffs. In the conditions of the blockade of Ukrainian ports and the specific tasks of their unblocking, the need to stimulate the export of agricultural products (goods) through alternative transport corridors becomes paramount. In order to ensure the state's food security, the central executive authorities retain the function of monitoring the volume of food exports, especially grain. Suggestions have also been made to European partners to increase export quotas for Ukrainian products by importing countries in the event of a stable increase in stocks of the commodity group.

Thus, the problem of improving the regulatory, legal, organisational and economic framework for the functioning of the agrarian market in Ukraine under martial law in order to perform its functions to the fullest extent possible should be considered in the current conditions as a systemic, complex task, the key aspects of which are as follows.

Firstly, to ensure uninterrupted production of agricultural products and food, it is necessary to compile a list of enterprises whose economic viability plays an important role in the functioning of the agricultural sector as a whole. Also, for agricultural enterprises that produce products of important social importance, it is necessary to monitor their organisational and economic condition. The government should prepare optimal and effective proposals for the intensification of production capacities, including the cultivation, production and processing of agricultural products.

Secondly, the following measures are envisaged in the area of administration and monitoring of the state food security system:

– Analysis of forecast balances of supply and demand for the main types of agricultural products;
– determination of the list of basic commodities of significant social importance (essential commodities);
– drawing up and updating forecast supply and demand balances for cereals, legumes, oilseeds, sugar, milk and dairy products, meat and meat products, eggs, etc.;
– regulation of price ceilings (tariffs), trade margins, and profitability standards for certain types of products, goods, and services of social importance.

Thirdly, the new situation in the state's activities requires the development of measures to create an extensive network of storage of reserves of raw materials and food resources to meet the strategic needs of the state. In this context, it is crucial to ensure uninterrupted processing of grain into flour and cereals, as well as the provision of long-term storage food products (flour and cereals) to certain categories of the population at the expense of the state budget.

Hence, the organisational and economic focus of regulatory measures in the food sector aimed at protecting domestic consumers will ensure the necessary level of income for agricultural producers and help to increase the competitiveness of the agricultural sector both in domestic and foreign markets.

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