

## ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

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V. V. Koval, Doctor of Economics,  
Associate Professor

Zh. V. Derii, Doctor of Economics,  
Professor,

I. O. Sedikova, Doctor of Economics,  
Associate Professor

В. В. Коваль, д. е. н., доцент,

Ж. В. Дерій, д. е. н., професор,

І. О. Седікова, д. е. н., доцент

### THE ROLE OF THE AGRICULTURAL SPHERE IN THE CONTEXT OF FOOD SECURITY

### РОЛЬ АГРОПРОДОВОЛЬЧОГО КОМПЛЕКСУ В КОНТЕКСТІ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ

**Urgency of the research.** The main direction of the state policy of Ukraine is the provision of food security. In this regard, the definition of the role of the agricultural and food complex in the context of food security is relevant.

**Target setting.** The problem of food security is multi-vector and manifests itself at different levels. A stable food security system of the country should have the following sub-systems: sustainable support based on the national agricultural and food-processing complex; physical and economic accessibility of all categories of the population to the main groups of food.

**Actual scientific researches and issues analysis.** The issue of the definition of the food supply state is studied in the scientific works of many economists such as O. Berezin, V. Boiko, O. Hoichuk, P. Sabluk, M. Khorunzhyi, O. Ulianchenko, O. Skydan, etc.

**Uninvestigated parts of general matters defining.** Many problems with determining the level of food security remain important and require more detailed consideration and study.

**The research objective.** Investigating the role of the agro-industrial complex in ensuring food security, its impact on the environment and identifying ways to reduce anthropogenic load on the environment.

**The statement of basic materials.** The importance of food security in the world countries is explored. The food security of the country is characterized by the stability, efficiency and stability of the agro-industrial complex and its ability to respond promptly to changes in demand and supply in the food market; level of transitional grain stocks; solvency of the population, in order to ensure equal access to food for all segments of the population; reduction of import dependence.

**Conclusions.** World experience and predictive calculations make it possible to state that the transition from an extensive method of grain crops production to intensive, which involves the reduction of agricultural land with a sharp increase in yields.

**Keywords:** food security; agro-industrial complex; resources; anthropogenic loading.

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**Urgency of the research.** The main direction of the state policy of Ukraine is the provision of food security. The solution of this problem reflects the level of agricultural and food complex development, political, economic stability of the country. This problem is especially acute in today's conditions of the

**Актуальність теми дослідження.** Головним напрямом державної політики України є забезпечення продовольчої безпеки. В зв'язку з цим визначення ролі агропродовольчого комплексу в контексті продовольчої безпеки є актуальною.

**Постановка проблеми.** Проблема забезпечення продовольчої безпеки багатовекторна та проявляється на різних рівнях. Стійка система продовольчої безпеки країни повинна мати такі підсистеми: стійке забезпечення, що ґрунтується на національному агропродовольчому комплексі; фізична і економічна доступність всіх категорій населення до основних груп харчування.

**Аналіз останніх досліджень і публікацій.** Питанню визначення стану продовольчого забезпечення присвячені наукові праці багатьох вчених-економістів О. Березін, В. Бойко, О. Гойчук, П. Саблук, М. Хорунжий, О. Ульянченко, О. Скидан, та інші.

**Виділення недосліджених частин загальної проблеми.** Але досить багато проблем щодо визначення ролі агропромислового комплексу в забезпеченні продовольчої безпеки залишаються важливими і потребують більш детального розгляду та вивчення.

**Постановка завдання.** Дослідження ролі агропромислового комплексу в забезпеченні продовольчої безпеки її вплив на навколишнє середовище та виявлення шляхів зменшення антропогенного навантаження на навколишнє природне середовище.

**Виклад основного матеріалу.** Досліджено важливість продовольчої безпеки у країнах світу. Продовольча безпека країни характеризується стабільністю, ефективністю та стабільністю агропромислового комплексу та її здатністю оперативно реагувати на зміни у попиті та пропозиції на продовольчому ринку; рівень перехідних запасів зерна; платоспроможність населення, з метою забезпечення рівного доступу до їжі для всіх верств населення; зменшення імпортової залежності.

**Висновки.** Світовий досвід і прогностичні розрахунки дають змогу стверджувати про можливість переходу від екстенсивного методу виробництва зернових культур до інтенсивного, що передбачає скорочення сільськогосподарських угідь при різкому підвищенні врожайності.

**Ключові слова:** продовольча безпека; агропромисловий комплекс; ресурси; антропогенне навантаження.

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economic decline in the country, which is due to the hryvnia devaluation, the decline in the living standards of the population, and the military actions in the east. In this regard, the definition of the role of the agricultural and food complex in the context of food security is relevant.

**Target setting.** Neither political circumstances nor global informatization are able to diminish the importance of food security. At the same time, this problem is multi-vector and manifests itself at different levels: regions, states, territories. It occupies a central place in research by economists and government officials not for so long time. Sustainable food security system of the country should have the following subsystems: stable support based on the national agricultural and food complex, which is constantly providing food products for the population at an sufficient level, responding quickly to changes in supply and demand for the food market; physical and economic accessibility of all categories of the population to the main groups of food (cereals, meat, fish, poultry, milk and dairy products, fruits and vegetables), different levels of solvency; a subsystem of protection of the domestic producer of food products from import-dependent goods.

At the present stage, the unevenness of production and consumption of food products can be traced. In countries with backward agricultural production there are food shortages. An analysis of the economic development of these countries suggests that they are not in a position to overcome this problem on their own. In developing countries, which accounts for almost 4/5 of the world's population, about 1/3 of all food is produced, and consumed 1/3 of its world level [11].

**Actual scientific researches and issues analysis.** The issue of the definition of the food supply state is studied in the scientific works of many economists. O. Berezin [1] examines the peculiarities of agricultural production, its importance for the formation of food resources flows, proposals for the formation of the national food market; V. Boyko [2] consider the legal regulation mechanism of relations with food security, investigate the gaps in the current agricultural legislation, pay attention to proposals on legislative consolidation; O. Hoichuk [4] examines the theoretical basis for the formation of the "food security" concept, studies the growth of food security in the world, analyzes modern trends and aspects of food security; P. Sabluk [7] examines the concept of national food security, analyzes political, legal and innovation factors, social and mental-psychological factors of food security; M. Khorunzhyi [12] analyzes the causes and factors of peculiarities and laws dimensions the issue of food security, as part of international economic security, explores the role of food security in the social and economic system and its place in this structure. O. Ulyanchenko [9] substantiates the conceptual aspects of establishing a stable food security system of Ukraine on the basis of sustainable agro-industrial formation explores the formation of a balanced food market; O. Skydan [8] justifies the need to establish food security as a strategic goal of the regional level; I. Irtyshcheva [5] considers activity on the basis of the constant introduction of innovation as the main condition for social and economic development of the country, pays attention to the innovative activity of the regional agricultural and food market and the development of the region.

The achievement of sustainable development of the region and ensuring its food security without a realistic assessment of the current situation is extremely difficult. The assessment process itself cannot ensure food security, but, in fact, it should encourage regional authorities to plan and implement the necessary measures and help them to take preventive and informed decisions to achieve the aim.

**Uninvestigated parts of general matters defining.** Many problems with determining the level of food security remain important and require more detailed consideration and study.

**The research objective.** The purpose of this study is a critical review of scientific works on food security issues, the definition of the role of agricultural production when ensuring food security, its impact on the environment and the identification of ways to reduce anthropogenic load on the natural environment.

**The statement of basic materials.** National security is directly related to the economic security of the markets and industries complexes, which requires the protection of the national interests of market entities in the context of increasing competition in the food market [3]. The affiliation of food security to the global class is manifested in the fact that it is an impartial social process, which basis is the close connection and interdependence of national economies, social and economic and political systems, as well as the human

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influence and the environment, demographic, environmental and energy problems, so countries with a high agricultural potential play a major role in addressing food security issues in the world.

UN data indicate that today the food crisis is threatening 37 countries [11]. The acceleration of the global food crisis is due to the lack of land previously used for growing agricultural products. Today, more and more land in America, the West and other regions is used to grow crops for the production of biofuels and other alternative sources of energy. At the same time, global changes are taking place with the growth of biofuel production in food markets. FAO data suggests that "since 2000, cereal consumption has increased by 4%, and its use for industrial purposes is 25%. In the United States, the use of corn for ethanol production during 2006-2015 has increased by 250%, which is a factor in rising food prices" [11]. FAO predicts that demand for biofuels will increase by 160% in the next 3 years, and food prices in the world will increase by 35%. According to the World Bank, over the past five years, the price of food in the world has increased by 78%, and since the beginning of 2017 the price of rice in Asia has increased threefold [11].

Ukraine is among the top three grain exporters in the world. According to the data, in the 2016-2017 marketing year, the country sold 36 million tons of crops. The leading position is occupied by the USA (86 million tons), followed by EU countries (43 million tons) [15]. Prices for wheat in world markets grew by 185% (120% only in 2017). It should be emphasized that the increase in food prices is due to: an increase in demand due to improved welfare, rising fuel and electricity prices, and biofuel production. For these reasons, Ukraine is particularly susceptible to constantly rising energy prices. Increasing energy prices entails rising food prices, as the country's food industry is most energy intensive in the world.

The new strategic food security vector focuses not only on hunger, constant access to major food groups, but also on factors such as energy, productivity, global warming, investment, and economic flexibility. The needs of the population in the main groups of food products are met by the national agricultural and food complex. It follows that the country's food security is characterized by the stability, efficiency and agility of the agro-industrial complex (AIC) and its ability to respond to changes in demand and supply in the food market quickly and in time; the level of transitional grain stocks; solvency of the population, in order to ensure equal access to food for all strata of the population; reduction of import dependence of those groups of goods, which production can be provided by the national agro-industrial complex.

The food security of the country depends on the state of the agro-industrial complex, therefore the main task is to ensure the proper state of the agrarian sector. In research [7] it is emphasized that "the agro-industrial complex provides 95% of the food resources; at its expense, more than 2/3 of the stock of consumer goods is formed; the value of fixed assets is 30% of their total value in the national economy. Almost all AIC products designed for the consumer, were made for the market.

Globalization processes in the social and economic sphere cause an increase in trade volumes in general and agricultural commodities in particular. For Ukraine, from the point of view of the implementation of agro-industrial complex export-import operations, the markets of European Union countries are the priority. P. Sabluk [7] states that "the main task of the Ukrainian agro-industrial complex is to increase the export potential of the agrarian sector, and the main priorities of the development of their foreign economic activity should be the further increase in the volumes of products supply and food products to the world agricultural and food market". Globalization should help Ukraine's agricultural and food industry to take its place in the global economy, as Ukraine has the richest soil in the world. It follows that the state's primary task is the rational use, conservation, and increase of soil fertility in order to obtain such production volumes that can meet the needs of the population of the country in a full-fledged, high-quality diet and export competitive agricultural products and receive constant profits. Globalization processes give Ukraine the opportunity to become one of the world's largest food suppliers, but it dictates changes in land market liberalization procedures, which will enable large investments in the domestic agrarian sector to be invested.

Agricultural production in Ukraine, despite changing climatic conditions, financial instability, lack of effective mechanisms of state regulation of agro-industrial markets, has strengthened its place in the

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international market in recent years. Ukraine holds the leading position of the world's exporter of grain products and vegetable oil.

Experts name the three dominant resources in the world that outline the future vector of country development - drinking water, grain and oil. Corn as a strategic global resource is the foundation of food security of countries, and the special factors of its production are climate conditions and agricultural lands. The total area of the world agricultural land is 4799 million hectares [13].

Cultivation of grain products is the main branch of agriculture. Developed countries produce 35% of the world's gross harvest of grain, which is the leader in terms of yield and grain per capita. It should be noted that 50% is consumer grain and 45% is forage. In recent years, there has been a fall in crop yields.

The world record for winter wheat production in New Zealand was 16.7 t/ha, with an average yield of irrigation - 12 t/ha, that in 2017 was only 60% from 2016. The blame for this was the drought and spring frost, the damage to crops by the disease caused by *Pseudomonas syringae* spp. The microbe has spread in the southern regions and has led to a loss of yield of up to 65% [13].

*Table 1*

**The sizes of arable lands of some countries of the world, million hectares**

Country	Size of arable land
The total area of arable land	3456
USA	190
India	158
Russia	132
China	98
Canada	51
Kazakhstan	41
Ukraine	33

**Source:** systematized by the authors [13]

FAO and the European Bank of Reconstruction and Development calculations in Ukraine, Kazakhstan and Russia are derived from a productive cycle of about 23 million hectares, and 13 million are likely to be carried out at no additional cost. The State Service of Ukraine for Geodesy, Cartography and Cadastre provides the following data: for 2016, Ukraine's land fund amounted to 60.4 million hectares, of which agricultural land was 43 million hectares (33 million hectares of arable land) [15].

According to the current norms, the cultivation of agricultural land at the level of 60-80% is unfavorable, 25-60% - conditionally favorable and less than 25% - favorable. In Ukraine, unfavorable plots of land make 54% of the land fund and almost 79% of agricultural land, for comparison in the United States it makes 19%, France and Germany – 34, Italy – 32 [13; 14].

*Table 2*

**Level of anthropogenic loading of land in Ukraine**

Level of anthropogenic load	Rating	Category of land	Total, million hectares	% of the total S <sub>Ukraine</sub>
The highest	9	Lands of industry, transport, communication, energy, etc.	1,0	1,8
Very high	8	Agricultural lands	41,8	71
High	7	Lands of residential and public buildings	0,79	1,29
Between Medium and High	6	Water Fund Lands	2,39	3,99
The average	5	Lands of historical and cultural destination	0,39	0,59
Between Low and Middle	4	Lands for recreational purposes	1,0	1,59
Low	3	Lands for health purposes	0,029	0,049
Very Low	2	Forest Fund Lands	10,59	17,59
Lowest	1	Lands of natural reserve and other nature conservation purposes	2,39	3,99

**Source:** systematized by the authors [11; 12; 15]

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The coefficient of relative tension of the ecological economic condition of the territory, which takes into account the land of the entire territory is calculated.

$$K_R = \frac{\sum S_{6-9}}{\sum S_{1-5}} = \frac{45.97}{14.43} = 3.2$$

where  $\sum S_{6-9}$  – the area of a group of lands with high anthropogenic load;

$\sum S_{1-5}$  – the area of a group of lands with a low anthropogenic load.

It shows the level of environmentally hazardous development of the territory and indicates the shift of the natural-human system to anthropogenic impact or to increase of the potential for renewal of natural resources. This indicator for Ukraine is 3.2, which indicates a critical anthropogenic load that can not be balanced with its environmental potential. It should be emphasized that food security in Ukraine is provided by the critical anthropogenic load on the natural environment. In some regions, land cultivation reaches more than 80% (with a standard 25%); 5 million hectares of arable land are not used in agricultural activities under various circumstances [12; 13; 15].

**Conclusions.** The analysis made it possible to distinguish the following subsystems of food security of the country: stable support based on the national agricultural and food complex, which constantly provides the population with foodstuffs on an adequate level; physical and economic accessibility of all categories of the population to the main groups of food, different levels of solvency; the subsystem of the protection of the domestic producer of food products from import-dependent food and resource provision. The membership of food security to the global class is determined, which is manifested in the fact that it is an impartial social process, which basis is the close connection and interdependence of national economies, socio-economic and political systems, as well as the influence of man and the environment. The country's food security is characterized by the stability, efficiency and agility of the agro-industrial complex and its ability to respond to changes in demand and supply in the food market quickly and in time; the level of transitional grain stocks; the solvency of the population, in order to ensure equal access to food for all the working masses of the population.

It is proved that agricultural production of Ukraine, despite changing climatic conditions, financial instability, lack of effective mechanisms of state regulation of agro-industrial markets, has strengthened its place in the international market in recent years. Ukraine holds the leading position of the world's exporter of grain products and vegetable oil. The three dominant resources in the world that outline the future vector of country development are named - drinking water, grain and oil. The study calculated the ratio of relative tensions of the ecological economic status of the territory, which takes into account the land throughout the territory, which indicates the level of environmentally dangerous development of the territory and indicates the shift of the natural-human system in the direction of increasing human impact or to increase the potential for renewal of natural resources. World experience and predictive calculations make it possible to state that the transition from an extensive method of production of grain crops to intensive, which involves the reduction of agricultural land with a sharp increase in yields. Already, at pessimistic indicators of grain yield 55 t/ha and with the preservation of the value of gross collection, it is possible to withdraw 6.2 million hectares of arable land in the status of the land of natural reserve and other nature conservation purposes, which will reduce the anthropogenic load on the natural environment.

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**Дерій**

**Жанна Володимирівна**

доктор економічних наук, професор, завідувач кафедри теоретичної та прикладної економіки, Чернігівський національний технологічний університет;  
<https://orcid.org/0000-0003-3695-7202>;  
ResearcherID: F-3828-2014;  
SPIN-код: 6409-6365;

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**ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ**

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- Derii  
Zhanna Volodymyrivna** E-mail: jannet\_d@ukr.net;  
Doctor of Economics, Professor, Head of the Department of Theoretical and Applied Economics,  
Chernihiv National University of Technology;  
<https://orcid.org/0000-0003-3695-7202>;  
ResearcherID: F-3828-2014;  
SPIN-code: 6409-6365;  
E-mail: jannet\_d@ukr.net;
- Коваль  
Віктор Васильович** доктор економічних наук, доцент, завідувач кафедри прикладної економіки, Одеський  
торговельно-економічний інститут Київського національного торговельно-економічного  
університету;  
<https://orcid.org/0000-0003-2562-4373>;  
ResearcherID: B-8479-2018;  
E-mail: victor-koval@ukr.net;
- Koval  
Viktor Vasylovych** Doctor of Economics, Associate Professor, Head of the Department of Applied Economics,  
Odessa Institute of Trade and Economics of Kyiv National University of Trade and Economics;  
[orcid.org/0000-0003-2562-4373](https://orcid.org/0000-0003-2562-4373);  
ResearcherID: B-8479-2018;  
E-mail: victor-koval@ukr.net;
- Седікова  
Ірина Олександрівна** доктор економічних наук, доцент, доцент кафедри менеджменту і логістики, Одеська  
національна академія харчових технологій;  
<https://orcid.org/0000-0003-4376-1267>;  
ResearcherID: S-7752-2016;  
E-mail: Irina-sedikova@rambler.ru;
- Sedikova  
Iryna Oleksandrivna** Doctor of Economics, Associate Professor, Associate Professor Head of the Department of  
Management and Logistics, Odessa National Academy of Food Technologies;  
<https://orcid.org/0000-0003-4376-1267>;  
ResearcherID: S-7752-2016;  
E-mail: Irina-sedikova@rambler.ru