

THE ROLE OF EFFICIENT SUPPLY CHAINS IN ENSURING FOOD SECURITY OF UKRAINE**HASENKO Yuliia**¹Taras Shevchenko National University of Kyiv<https://orcid.org/0009-0001-8854-092X>e-mail: yuliia.hasenko@gmail.com

The article examines the relationship between supply chains and the food security of Ukraine. It is substantiated that food security affects social stability, economic development and is a strategic priority of the state. It is noted that the stability and adaptability of logistics systems are factors for guaranteeing the availability of food products, the stability of the domestic market, and the fulfillment of the state's export obligations. The dynamics of export and import of goods and services as key indicators of Ukraine's food security were studied. This made it possible to note that there is a shift in the export structure in favor of agricultural products and there is a transition from an industrial-agrarian to an agrarian-raw material export model. The key problems of the functioning of supply chains are identified, namely insufficient integration of manufacturers, processors and trade networks, low level of digitization of management processes, limited alternative transport routes and weak coordination between business and the state in crisis situations. Strategic directions for improving the efficiency of supply chains to ensure food security of Ukraine are proposed. The main directions should be focused on infrastructure, technologies, diversification, and institutional reforms. Such directions include the modernization and development of transport infrastructure, digitalization of supply management processes, state support for the agricultural sector, and international cooperation.

Keywords: food security, supply chain, challenges, agro-industrial products, alternative logistics routes, strategic directions, sustainability, reliability.

<https://doi.org/10.31891/mdes/2025-17-50>

Стаття надійшла до редакції / Received 02.07.2025

Прийнята до друку / Accepted 22.08.2025

**PROBLEM STATEMENT IN GENERAL FORM
AND ITS RELATION TO IMPORTANT SCIENTIFIC OR PRACTICAL TASKS**

The strategic priority of the state is food security, as it directly impacts social stability, economic development, and national security. Effective supply chains are a key factor in ensuring Ukraine's food security, yet they face diverse modern challenges, such as globalization, infrastructure destruction, port blockades, and grain export restrictions resulting from the war. Ukraine is one of the leading exporters of agro-industrial products and grain; therefore, the efficiency of its supply chains holds not only domestic but also international significance. Supply chain resilience determines the state's ability to provide the population with food and maintain economic stability. Despite the high potential of Ukraine's agro-industrial complex, the efficiency and stability of supply chain functioning remains a critically weak link in the food security system. Modern agro-industrial supply chains in Ukraine are characterized by low levels of integration and digitalization, critical dependence on a few major logistical arteries, and weak coordination between the state and the private sector. This makes the entire food system vulnerable to external shocks, creates systemic inflationary risks, and leads to uneven food access for the population. Furthermore, the insufficient adaptability of existing logistics systems limits their capacity to ensure food security at various hierarchical levels of management.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Various aspects of food security have been explored by scholars both in Ukraine and abroad. International researchers [1–5] focus on the interrelationship between climate change, global supply chains, and the resilience of agricultural systems concerning food security. In particular, [1] examines the impact of the EU's Common Agricultural Policy on ensuring food security and the innovative development of the agricultural sector. The essence of food security, the principles of its formation in Ukraine, and the influence of modern challenges are considered in [2–3]. The authors in [4] investigate the impact of war on the food supply chain. Furthermore, food security as a component of Ukraine's economic security is highlighted in [5].

In the works of several authors [9–11], significant attention is paid to the formation and management of supply chains at the enterprise level. In [9], four groups of key performance indicators (KPIs) for the supply chain are identified, specifically those related to: the logistical product; the search for information and financial sources; and transportation and pricing. The main problems arising during the formation of logistical supply chains under martial law are highlighted by the authors in [10], who also propose a strategy for supply chain formation and management at the enterprise level. Finally, [11] substantiates the use of information systems in supply chain management.

IDENTIFICATION OF PREVIOUSLY UNRESOLVED PARTS OF THE GENERAL PROBLEM ADDRESSED IN THE ARTICLE

Despite a significant body of research addressing various aspects of Ukraine's food security, there is a growing need for further scholarly inquiry into identifying the specific factors, particularly supply chains, that contribute to ensuring food security in Ukraine. This necessity defines the primary objective of this article.

PRESENTATION OF THE MAIN RESEARCH MATERIAL

Geopolitical conflicts, globalization, and environmental instability determine the level of Ukraine's food security. Specifically, geopolitics dictates the external conditions for access to markets and resources, globalization shapes the rules and opportunities for integration into global supply chains, and environmental instability creates risks for the internal resilience of the system. Supply chains within the agro-industrial sector are a critical element that ensures the accessibility, availability, and stability of food for the Ukrainian population. The key function of supply chains is the physical movement of food, which is a prerequisite for its availability to consumers and the foundation of food resilience and accessibility across all regions. The role of supply chains became particularly acute during the full-scale war of the Russian Federation against Ukraine. This aspect demands increased resilience and rapid adaptation of logistics networks. For Ukraine, it is vital to maintain the openness of trade routes, as they ensure the continuous bilateral movement of goods, form the basis of economic stability, and guarantee food security. As a result of the full-scale invasion, traditional logistical routes, specifically seaports, suffered large-scale blockades, which impacted grain exports and the import of critical goods. This not only restricted Ukraine's access to global markets but also threatened global food stability, as Ukrainian agricultural products are strategic for many countries worldwide. In response to these challenges, the European Commission initiated the Action Plan for "Solidarity Lanes" in May 2022 to create alternative logistical routes [6]. This mechanism partially compensated for the loss of maritime routes, ensured the export of Ukrainian products, and supported the domestic market. It should be noted that these alternative logistics paths have become more than just an adaptation tool; they represent a vital element of international support for Ukraine. Furthermore, they helped maintain Ukraine's role as one of the key food suppliers on the global market and a guarantor of global food security.

Supply chains are a key tool for risk management, including the creation of buffer stocks, diversification of supply sources, and the implementation of monitoring systems to track product shortages or surpluses.

The efficiency of supply chains directly affects price stability and, consequently, the economic affordability of food for the population. Inefficient logistics, downtime, excessive intermediation, and corruption can significantly increase the final price of a product; therefore, the optimization and digitalization of supply chains are vital factors for restraining food inflation. Additionally, well-established supply chains prevent sharp price fluctuations caused by temporary shortages in specific regions. Reliable supply chains support domestic producers, which forms the basis of long-term food security.

Let us examine the dynamics of exports and imports of goods and services as key indicators of Ukraine's food security, as reflected in fig. 1.

The dynamics of exports and imports of goods and services for 2013-2024 reflect transformational processes driven by internal and external challenges. It should also be noted that Figure 1 demonstrates a growth in export-import operations; however, imports to Ukraine chronically exceed exports, leading to a negative foreign trade balance for Ukraine.

Exports of goods and services during the analyzed period are characterized by significant fluctuations. In particular, in 2014-2015, due to military actions and the loss of part of the industrial potential, exports gradually recovered thanks to the agricultural sector and integration into European markets. The blockade of seaports in 2022-2023 caused a sharp drop in volumes, which was only partially offset by the "Solidarity Lanes" and alternative routes.

Imports demonstrated a consistently high level, indicating Ukraine's dependence on external supplies of energy resources, technology, and consumer goods. After a sharp contraction in 2020, imports recovered quickly, exceeding exports.

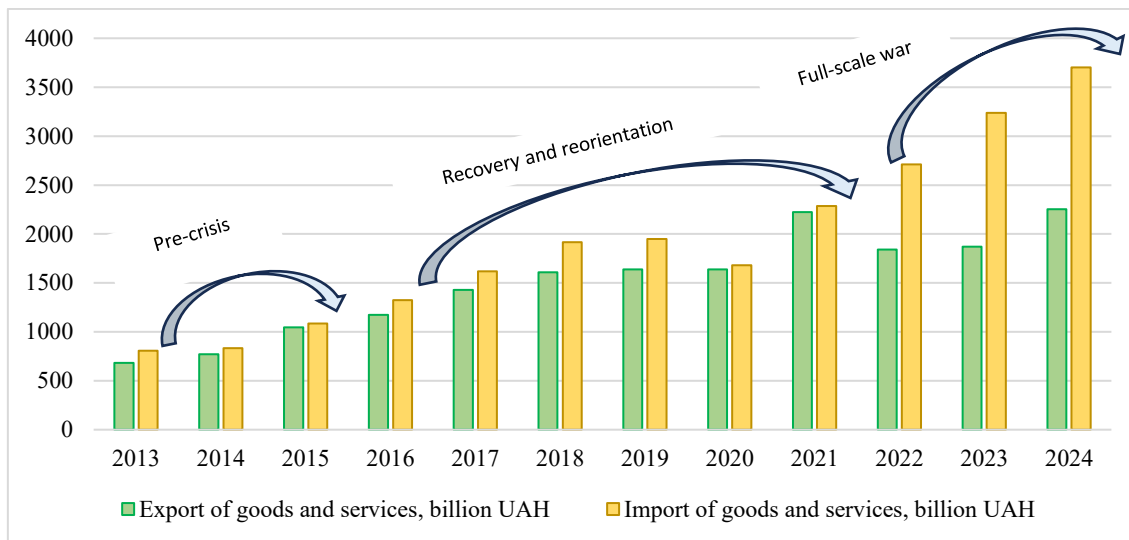


Fig. 1. Dynamics of export-import operations in Ukraine for 2013-2024

Source: created by the author based on [7]

Summarizing the above, it should be noted that there is a structural shift in exports in favor of agricultural products and a decrease in the share of industrial goods; in other words, a transition has occurred from an industrial-agricultural to an agro-raw material export model.

Until 2014, a significant share of exports consisted of metallurgy, machine building, and the chemical industry. From 2015 to 2021, metallurgy lost its position due to the occupation of Donbas, making the agro-industrial complex, specifically grain and vegetable oil has become the primary source of foreign exchange earnings. Due to the war of the Russian Federation against Ukraine in 2022-2024, the destruction of metallurgical plants in the city of Mariupol, along with the logistical blockade of seaports, finally solidified the dominance of agro-industrial products.

In 2022-2024, export dynamics do not depend solely on demand or harvest yields; instead, they are a function of border throughput capacity. The blockade of Black Sea ports forced a reorientation of flows to railways and Danube ports, which led to a significant increase in logistics costs and a decrease in the profitability of exporters.

In general, the country has maintained its export potential in the food sector, but it requires the implementation of a strategic policy to reduce import dependence and establish a positive trade balance.

Table 1

Problems in the functioning of supply chains from the perspective of ensuring food security in Ukraine

Problems	Characteristics
Insufficient integration of producers, processors, and retail chains into a unified logistical system	The absence of a unified logistical system leads to disruptions between the stages of production, processing, and distribution, which reduces supply efficiency and creates risks of product shortages or surpluses, resulting in instability in the food supply for the population.
Low level of digitalization and automation of supply management processes	The lack of IT solutions in supply chain management limits the possibilities for inventory monitoring, rapid response to changes in demand, and route optimization. This reduces transparency and control over the movement of goods.
Limited availability of alternative transport routes when main paths are blocked	The blockade of seaports due to the war has led to the vulnerability of the system. The insufficient development of railway, road, and inland waterway routes limits export capabilities, which poses a threat to the domestic market and the fulfillment of Ukraine's international obligations.
Uneven access of the population to food products across different regions	Regional disparities in food supply, especially in combat zones or remote territories, deepen social inequality, which directly impacts food security.
Weak coordination between business and the state in crisis situations	The lack of effective mechanisms for interaction between the private sector and state institutions complicates rapid responses to challenges. This manifests as delays in decision-making, inconsistency of actions, and insufficient support for agricultural producers and logistics companies.

Source: compiled by the author based on [1-5, 8-11]

The main problems in the functioning of supply chains include insufficient integration of producers, processors, and retail chains into a single logistical system; a low level of digitalization and automation in supply management processes; the limited availability of alternative transport routes when main paths are blocked; uneven access to food products across different regions; and weak coordination between business and the state in crisis situations (Table 1). These outlined problems form a circle of vulnerabilities, where a disruption in one link is instantly amplified due to low integration, leading to uneven access and general instability.

The problems summarized in table 1 reduce the resilience of supply chains and create risks for Ukraine's food security. Addressing them requires a comprehensive approach that combines digital transformation, infrastructure development, and effective interaction between the state and business.

Under the conditions of current challenges, especially during the country's economic recovery after the war, improving the efficiency and resilience of agro-industrial supply chains in Ukraine is a strategic priority. The main focus areas should be infrastructure, technology, diversification, and institutional reforms, as presented in fig. 2.

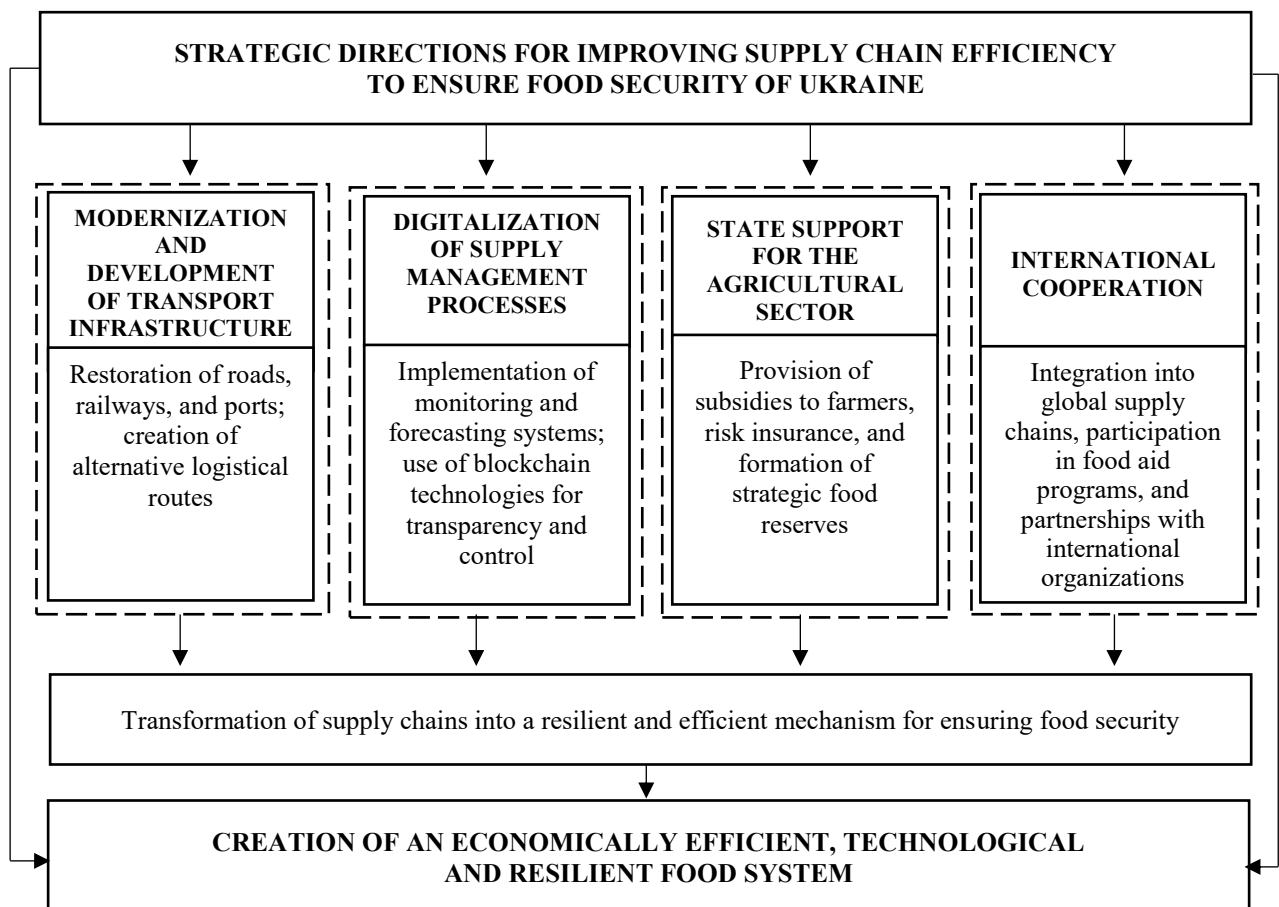


Fig. 2. Strategic directions for enhancing supply chain efficiency

Source: compiled by the author

Efficient supply chains impact food security and ensure domestic market stability by reducing shortages and price fluctuations, enhancing social security, and increasing the country's export potential. This strengthens Ukraine's position in the global grain market as one of the leading players and bolsters economic resilience. The creation and development of alternative logistical corridors are of strategic importance for the food security of Ukraine. These corridors ensure the sustainability of the agricultural sector, mitigate the risks of food shortages, and consolidate the state's position in the global supply system. The "Solidarity Lanes" initiative has proven that international cooperation can serve as an effective tool for counteracting geopolitical challenges. The establishment and development of such routes have a dual effect: ensuring the stability of the domestic supply system and fulfilling a global humanitarian function by supporting global food stability.

For the long-term food security of Ukraine and the world, the full restoration and security guarantee of maritime export routes are essential.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

Supply chains in Ukraine represent a complex, multi-vector mechanism operating under constant pressure from external and internal challenges. The war-induced destruction of industrial potential has rendered the economy critically dependent on agricultural exports and external financing to cover import needs. Efficient supply chains ensure the continuous movement of products from producer to final consumer, minimize the risks of shortages, and contribute to the stability of the domestic market. They serve not only as a tool for economic stability but also as a guarantor of social justice and national security.

In the context of ensuring food security, the strategic priorities for the state regarding supply chain efficiency include modernization, digitalization, and increasing resilience. Investments in the development of storage, processing, and transportation infrastructure are vital for ensuring long-term food security.

Further research should focus on developing methodological, scientific, and practical approaches to forming efficient supply chains to ensure the food security of Ukraine. A promising area of study is the development of key performance indicators (KPIs) for supply chains as a foundation for strategic security management.

REFERENCES:

1. Belova I., Brych V., Borysiak O., Shuvar A., Yaroshchuk O. (2024). Prodovolcha bezpeka ta ahramni innovatsii: otsinka efektyvnosti spilnoi polityky YeS. *Ekonomicnyi analiz*. Tom 34. № 4. pp. 180-190. DOI: <https://doi.org/10.35774/econa2024.04.180>.
2. Prodovolcha bezpeka Ukrainy v umovakh suchasnykh vyklykiv: monohrafiia (2023) / S.V. Ivanov; NAN Ukrainy, DU «In-t. rynku i ekon.-ekol. doslidzh. NAN Ukrainy». Odesa: DU «IREED NANU». 291p. <https://doi.org/10.31520/978-617-14-0058-0>.
3. Prodovolcha bezpeka: svitovi tendentsii ta mozhlyvosti ahroprodovolchoho kompleksu Ukrainy: monohrafiia (2022) / L.V. Shynkaruk; Natsionalnyi universytet bioresursiv i pryrodokorystuvannia Ukrainy. Kyiv, 307 p.
4. Hamed Gheibdoust, Shahram Gilaninia. (2023). The impact of the Ukraine war on the global food supply chain security: a literature review. *International Journal of Logistics Economics and Globalisation*. DOI: [10.1504/IJLEG.2023.10056759](https://doi.org/10.1504/IJLEG.2023.10056759).
5. Krylov D.V. (2023). Problemy zabezpechennia prodovolchoi bezpeky Ukrainy v suchasnykh umovakh. *Problemy suchasnykh transformatsii*. Seriya: ekonomika ta upravlinnia, (7). 2023. pp.1-5. <https://doi.org/10.54929/2786-5738-2023-7-03-07>.
6. Ofitsiinyi veb-sait Yevropeiskoho Soiuzu. URL: <https://surl.lu/hsuwsk>.
7. Minfin. <https://index.minfin.com.ua/ua/economy/gdp/eximp/>.
8. Lanchenko Y., Kravchenko O., Shkurenko O., Sytnyk O., Buiskykh O. (2024). Formation of a strategy to increase the efficiency of agricultural enterprises. *Economics and Business Management*, 15(4), pp. 82-102. <https://doi.org/10.31548/economics/4.2024.82>.
9. Shkurenko O.V., Korniiko Ya.R., Prokopenko N.D. (2023). Upravlinnia lantsiuhamy postachan v konteksti destabilizatsii biznes-seredovyscha. *Aktualni problemy ekonomiky*. № 10 (268). pp. 6-13. <https://www.doi.org/10.32752/1993-6788-2023-1-268-6-13>.
10. Bezditko O. Ye., Kravchuk I. I., Lavrynenko S. O. Stratehiia formuvannia i upravlinnia lohistychnymy lantsiuhamy postavok na pidpriemstvi. *Stalyi rozvytok ekonomiky*. № 2 (49). 2024. S. 252-257. DOI: <https://doi.org/10.32782/2308-1988/2024-49-40>.
11. Chobitok V., Litvinchuk S. (2024). Systemy informatsiinoho zabezpechennia transportnoi lohistyky v pidpriemnytskii diialnosti. *Herald of Khmelnytskyi National University. Economic Sciences*, 332(4), 2024. pp. 14-21. <https://doi.org/10.31891/2307-5740-2024-332-2>

РОЛЬ ЕФЕКТИВНИХ ЛАНЦЮГІВ ПОСТАЧАЊ У ЗАБЕЗПЕЧЕНІ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ УКРАЇНИ

ГАСЕНКО Юлія

Київський національний університет імені Тараса Шевченка

У статті досліджено взаємозв'язок ланцюгів постачань та продовольчої безпеки України. Обґрунтовано, що продовольча безпека впливає на соціальну стабільність, економічний розвиток та є стратегічним пріоритетом держави. Зазначено, що стійкість та адаптивність логістичних систем є чинниками для гарантування доступності продуктів харчування, стабільності внутрішнього ринку та виконання експортних зобов'язань держави. Досліджено динаміку експорту та імпорту товарів та послуг як ключових показників продовольчої безпеки України. Це дозволило зазначити, що спостерігається зміщення структури експорту на користь аграрної продукції і відбувається перехід від індустріально-аграрної до аграрно-сировинної моделі експорту. Визначено ключові проблеми функціонування ланцюгів постачань, а саме недостатня інтеграція виробників, переробників і торговельних мереж, низький рівень цифровізації процесів управління, обмеженість альтернативних транспортних маршрутів та слабка координація між бізнесом і державою у кризових ситуаціях. Запропоновано стратегічні напрями підвищення ефективності ланцюгів постачань для забезпечення продовольчої безпеки України. Основні напрями мають бути сфокусовані на інфраструктурі, технологіях, диверсифікації та інституційних реформах. До таких напрямів віднесено модернізацію та розвиток транспортної інфраструктури, цифровізація процесів управління постачанням, державну підтримку аграрного сектору та міжнародну кооперацію.

Ключові слова: продовольча безпека, ланцюг постачань, виклики, агропромислова продукція, альтернативні логістичні маршрути, стратегічні напрями, стійкість, надійність.