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ASSESSMENT OF THE LEVEL OF COMPETITIVENESS OF FOOD INDUSTRY ENTERPRISES ON THE BASIS OF CIRCULAR INNOVATION

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ОЦІНКА РІВНЯ КОНКУРЕНТОСПРОМОЖНОСТІ ПІДПРИЄМСТВ ХАРЧОВОЇ ПРОМИСЛОВОСТІ НА ЗАСАДАХ ЦИРКУЛЯРНИХ ІННОВАЦІЙ

The article provides a comprehensive assessment of the level of competitiveness of Ukrainian food industry enterprises based on circular innovations. The feasibility of integrating the principles of the circular economy into the enterprise management system as a key tool for increasing resource efficiency, reducing production costs and forming sustainable competitive advantages is substantiated. It is proven that in conditions of military challenges, circular innovations acquire strategic importance, ensuring the adaptability and stability of the functioning of enterprises. The dynamics of production, resource and innovation-environmental indicators of the development of the industry in the pre-war and war periods are analyzed. The impact of the circularity index on the competitiveness of enterprises is determined. It is established that the implementation of circular innovations contributes to increasing the economic stability and adaptability of enterprises to crisis conditions. The directions of development of circular business models, digitalization of production and integration of enterprises into European value chains are outlined.

У статті проведено комплексну оцінку рівня конкурентоспроможності підприємств харчової промисловості України на засадах циркулярних інновацій. У процесі дослідження використано методи економічного аналізу, порівняння, графічного моделювання, індексного підходу та кореляційно-регресійного аналізу, що дозволило оцінити взаємозв'язок між інноваційною активністю, рівнем утилізації відходів, використанням вторинної сировини та показниками конкурентоспроможності підприємств харчової промисловості. Обґрунтовано доцільність інтеграції принципів циркулярної економіки в систему управління підприємствами як важливого інструменту підвищення ресурсоефективності, зниження виробничих витрат та формування стійких конкурентних переваг. Доведено, що в умовах воєнних викликів циркулярні інновації набувають стратегічного значення, забезпечуючи адаптивність і стабільність функціонування підприємств. Проведено аналіз динаміки виробничих, ресурсних та інноваційно-екологічних показників розвитку галузі довоєнного та воєнного

періоду. Запропоновано підхід до розрахунку інтегрального індексу циркулярності як узагальнюючого показника ефективності впровадження циркулярних практик у виробничі процеси. Визначено вплив індексу циркулярності на конкурентоспроможність підприємств. За результатами дослідження доведено, що зростання індексу циркулярності супроводжується підвищенням рентабельності, скороченням енергоємності виробництва, оптимізацією використання ресурсів та посиленням ринкових позицій підприємств. Практичне значення отриманих результатів уможливлює використання запропонованого підходу для формування управлінських рішень щодо модернізації виробництва, активізації інноваційно-інвестиційної діяльності та забезпечення довгострокового розвитку підприємств харчової промисловості України. Встановлено, що впровадження циркулярних інновацій сприяє підвищенню економічної стійкості та адаптивності підприємств до кризових умов. Окреслено напрями розвитку циркулярних бізнес-моделей, цифровізації виробництва та інтеграції підприємств у європейські ланцюги створення вартості.

Keywords: *competitiveness of enterprises, food industry, innovation, circular economy, circular business models, greening of production, energy efficiency, waste management.*

Ключові слова: *конкурентоспроможність підприємств, харчова промисловість, інновації, циркулярна економіка, циркулярні бізнес-моделі, екологізація виробництва, енергоефективність, управління відходами.*

Formulation of the problem. The modern development of food industry enterprises in Ukraine takes place in conditions of deep structural transformations caused by global processes, increased competition and limited resources. At the same time, a significant destabilizing effect on food industry enterprises is exerted by martial law, which has caused disruption of logistics chains, loss of part of production capacities, shortage of raw materials, increase in the cost of energy and

decrease in the purchasing power of the population. Under such conditions, traditional approaches to effective support and sustainability of the functioning of food industry enterprises are insufficient for the development of their competitiveness.

Food industry enterprises face a number of systemic problems, among which technological obsolescence of fixed assets, low level of innovation activity, dependence on imported energy and technologies, as well as insufficient level of digitalization of production processes are of particular relevance. Inefficient management of waste and resources, which leads to losses of raw materials, increased cost of production and increased environmental impact, is also a significant problem. In addition, enterprises are forced to adapt to the stricter requirements of international markets regarding quality, product safety and environmental standards, which requires additional investments and organizational changes.

In this context, the use of circular innovations as a tool for increasing resource efficiency, reducing costs and creating new competitive advantages is of particular importance. However, the lack of a comprehensive approach to assessing the impact of such innovations on the level of competitiveness of enterprises hinders their widespread implementation, taking into account modern challenges, including the shortage of financial resources for the implementation of innovations, the lack of investment support and technological solutions to strengthen environmental requirements for production processes, quality and waste management of food products, and all these trends are intensified in the crisis conditions of the functioning of the Ukrainian economy. Its solution will contribute to increasing the sustainability of enterprises, ensuring their long-term development and integration into the European economic space.

Analysis of recent research and publications. The issue of forming the competitiveness of enterprises and the use of circular innovations is the subject of active research in the field of economics and sustainable development. Leading foreign scientists have made a significant contribution to the development of the theoretical and methodological foundations of the circular economy, in particular,

M. Geisdorfer in his fundamental work considers the circular economy as a new paradigm of sustainable development, which integrates economic, environmental and social aspects of the functioning of enterprises, and their transition to circular business models contributes to increasing resource efficiency, reducing costs and creating long-term competitive advantages through innovation and closed production cycles [27]. J. Kirchherr carried out an in-depth content analysis of more than a hundred definitions of the circular economy, which allowed to systematize its essential characteristics and identify key principles: reduction, reuse and recycling, with an emphasis on the need for a comprehensive approach to the implementation of circular practices, which include institutional, technological and behavioral aspects [29]. A significant contribution to the development of the concept of circular business models was made by N. Boken, who proposed a classification of innovation models focused on slowing down, narrowing and closing resource flows and argued that it is the business model that is the tool for transforming enterprises towards circularity, which directly affects their competitiveness [22].

Among Ukrainian scientists, an important place is occupied by the studies of O. Nishkhodovska and O. Byalkovska, who consider the competitiveness of enterprises as a multidimensional category that is formed under the influence of innovative activity, the institutional environment and sustainable development factors, with an emphasis on the need to integrate environmental aspects into the enterprise management system as a prerequisite for improving their competitive positions [15]. G. Kaletnik, S. Lutkovska, as well as Ya. Omelchenko, G. Obykhod, T. Nechytaylo focus on the greening of production, justifying the economic feasibility of implementing resource-saving technologies, waste management systems and environmental standards and innovations that contribute not only to reducing the negative impact on the environment, but also to increasing the efficiency of enterprises [13; 16].

Analysis of scientific research indicates a significant level of development in the theoretical aspects of competitiveness and the circular economy. At the same

time, the issues of comprehensive assessment of the impact of circular innovations on the competitiveness of food industry enterprises remain insufficiently studied, especially in the context of crisis transformations of the economy of a country that functions and develops under the influence of military challenges and restrictions, which necessitates further scientific research in this direction.

Formation of research objectives. The purpose of the study is a comprehensive assessment of the level of competitiveness of food industry enterprises on the basis of circular innovations, taking into account production-resource, innovation-environmental and market factors, as well as military factors that level the normal functioning of the economy in the state.

Presentation of the main research material with full justification of the scientific results obtained. In the difficult conditions of the functioning of the food industry, caused by military challenges, disruption of logistical connections and an increase in the cost of production resources, the analytical value of performance indicators that form and ensure the ability of industry entities to quickly respond to external shocks and internal imbalances is of particular importance. In these conditions, the role of innovative approaches to the organization of production, resource conservation and cost optimization is increasing, which allow maintaining the stability of economic performance. Increasing the analytical value of performance indicators allows not only to state actual changes in the development of the industry, but also to determine their structural causes and potential directions for further adaptation of enterprises to modern circular innovations, which act as a tool for increasing the efficiency of the use of production and resource potential and the formation of long-term competitive advantages in the transformational environment of the state economy, and in particular its significant branches of the food industry. In this context, the study of factors that determine the resilience of enterprises to crisis phenomena and their ability to quickly restore production and resource potential is of particular importance.

In the studies of O. Dragan it is proved that under martial law conditions the competitiveness of food industry enterprises largely depends on their ability to

adapt development strategies to new economic risks, logistical constraints and changes in demand [24]. In this context, the combination of organizational and economic mechanisms of competitiveness management [28] with institutional levers of innovation and investment ensuring stable competitive positions of food industry enterprises in an unstable environment, which are defined by V. Lagodienko as a necessary strategic factor for increasing the role of investments in technological equipment renewal and activation of value chains of industry entities [14], is important [14].

The analysis of the impact of innovations on the competitiveness of the food industry, which is used by N. Baninla with an emphasis on factors of quality management of food production in a closed cycle, which have a direct positive impact on the competitiveness of food industry enterprises in the conditions of global implementation of circular initiatives in the market, deserves special attention. V. Trail and M. Meilenberg, studying the specifics of competition in the food industry, emphasize the importance of compliance with product quality standards, innovations and marketing strategies in shaping the competitive positions of enterprises [32]. S. Hanson and T. Reardon analyzed the impact of food quality and safety standards on the competitiveness of enterprises, proving that compliance with international standards is an important factor in accessing global markets [25]. Among modern studies, it is worth noting the work of C. Galanakis, who considers innovations in the food industry, in particular waste processing and creating added value based on by-products, as an important factor in increasing the competitiveness of enterprises [26]. M. Dora and X. Gellink studied the impact of sustainable and circular practices in the food sector, emphasizing the role of innovations in ensuring the efficiency of supply chains and increasing the competitive advantages of enterprises [23]. Modern research is increasingly focusing on the industry-specific features of the food industry. In particular, K. Lukiyevska believes that important factors of competitiveness of food industry enterprises are intangible assets, internal competencies, product quality and effective market connections, and, at the same time, the importance of

a comprehensive approach to assessing the competitive potential of industry enterprises is considered through the use of innovations and technologies of Industry 4.0 (in particular, digitalization, automation and modern IT solutions), which is a determining factor in increasing the international competitiveness of food industry enterprises [30; 31].

In our opinion, from the list of factors influencing the competitiveness of food industry enterprises, it is necessary to highlight analytical elements of transformation, in particular economic risks, logistical constraints, sustainable competitive positions, demand stability, innovative activity, level of resource efficiency, investments in technological equipment renewal and activation of chains of financial support of the production process, ESG initiatives, institutional support of partnerships in circular value chains, which form the basis of circularity in the industry, and especially in the production process of meat, dairy, and bakery products, which are in significant demand on the market. It is these elements that provide a new model of industry functioning, focused on minimizing costs and maximizing effective analytical indicators, which create the basis for further development of competitive advantages of food industry enterprises.

An analysis of the dynamics of the food industry's production capabilities shows that in the pre-war period (2018-2021), it demonstrated steady growth in both production and sales. In particular, production increased by 28.5%, while sales increased by 23.1%. At the same time, profitability increased from 8.5% to 10.2% (+1.7 pp), and the industrial production index reached 105.2%, which confirms the expansion of production activity. In 2022, there was a synchronous reduction in both production (-9.7%) and sales (-9.4%). At the same time, the gap between them remained significant – UAH 128.1 billion, which indicates a decrease in sales efficiency in times of crisis. The industrial production index fell to 82.4%, and profitability – to 6.4%, which confirms the deep decline of the food industry.

In 2023-2025, the recovery of the food industry is uneven. Production volume increased by 4.1%, while sales volume had a more dynamic growth of 18.0%, which led to a reduction in the gap between production and logistics chains

– from UAH 271.4 billion in 2023 to UAH 197.3 billion in 2025, and indicates an improvement in marketing processes in the industries (Fig. 1).

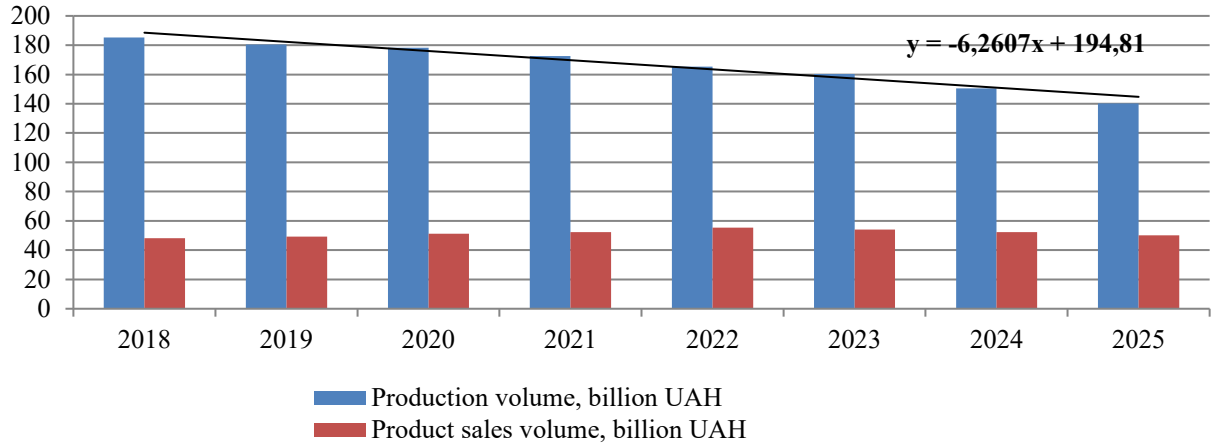

Figure 1. Dynamics of production capabilities of the food industry of Ukraine for 2018-2025

Source: built based on data [1-11;17-19]

At the same time, the industrial production index remains at 98.3%, indicating an incomplete recovery of production dynamics. In 2025, production volume exceeded the pre-war level by 17.1%, while sales exceeded it by 12.5%, confirming the structural imbalance between production and market capabilities of the industries (Fig. 2).

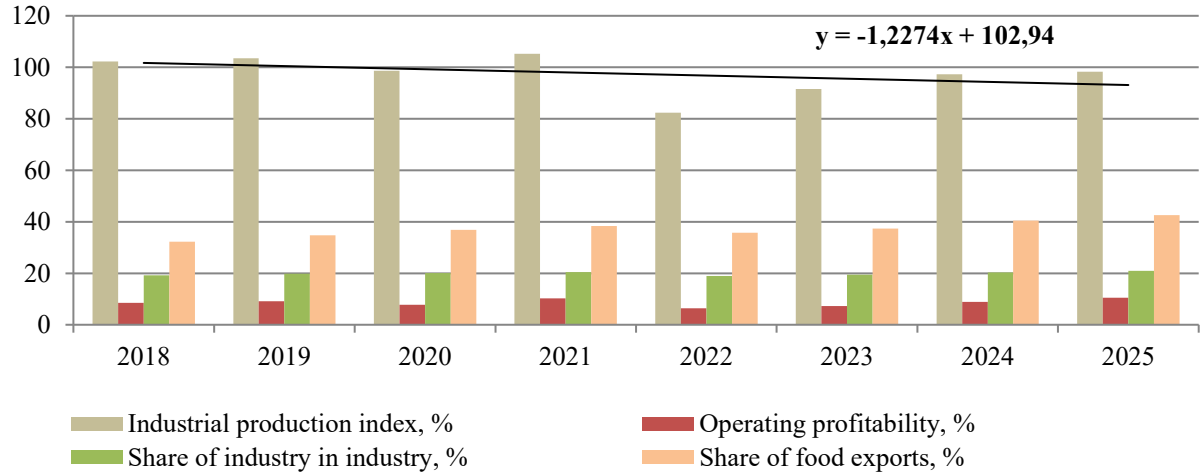

Figure 2. Dynamics of effective use of production capacities of the food industry of Ukraine for 2018-2025

Source: compiled based on data [1-11; 17-19]

The analysis of resource provision shows a gradual transformation of the production base of food enterprises in the direction of stabilizing the efficiency of resource use (Fig. 3). The energy intensity of production decreased from 185 to 140 kWh/thousand UAH, i.e. by 24.3%, which indicates the active implementation of energy-saving technologies. A particularly intense decrease occurred in 2023-2025, which is associated with the energy crisis and the need to optimize costs. At the same time, the level of depreciation of fixed assets increased from 48% in 2018 to 55% in 2022 (+7 pp), which indicates the accumulation of investment deficit in the industries. Only in 2024-2025 is there a partial improvement (up to 50%), which indicates the beginning of modernization processes at food industry enterprises.

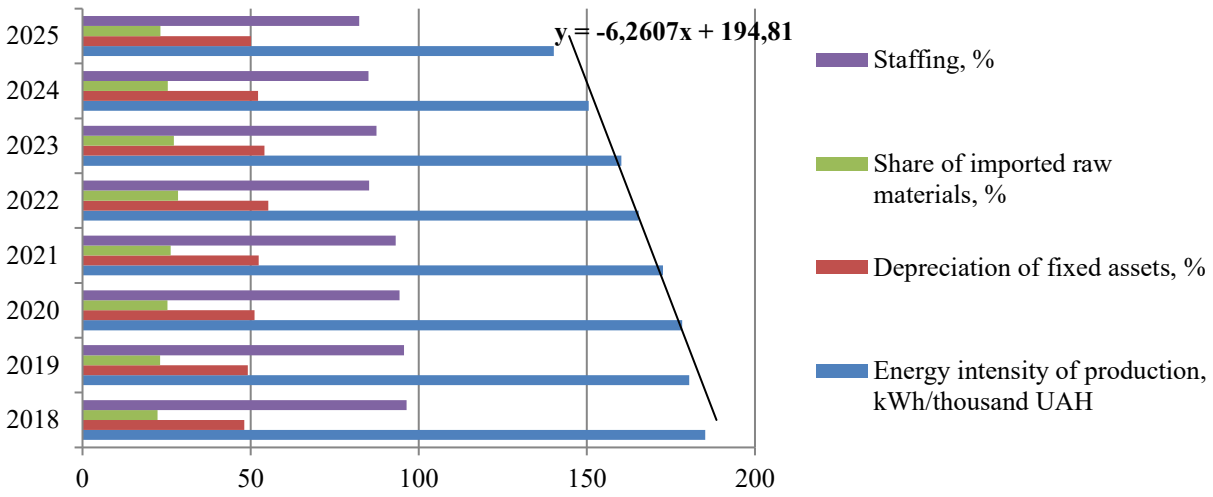

Figure 3. Indicators of resource provision of food industry enterprises for 2018-2025

Source: compiled based on data *[1-11; 17-19]*

The share of imported raw materials increased from 22.3% to 28.4% in 2022 (+6 pp), reflecting disruptions in domestic supply chains. However, already in 2025, the indicator decreased to 23.2%, indicating the gradual localization of production. The most sensitive element of resource provision remains the human resource potential of food industry enterprises. In the pre-war period (2018-2021),

its gradual reduction from 96.4% to 93.1% was observed, reflecting structural imbalances in the labor market. In 2022, the indicator dropped sharply to 85%. In 2023-2025, the dynamics of staffing was unstable, that is, after a partial recovery to 87.4% in 2023, a further decrease to 85.1% in 2024 and 82.3% in 2025 is observed. The main reason for this trend is large-scale migration processes, in particular, the departure of the economically active population abroad in 2022-2025, which led to the loss of a significant part of the qualified workforce. An additional impact is the mobilization of labor resources due to martial law in the country, which limits enterprises' access to workers, especially technical and production specialties. A significant factor is also the deterioration of working conditions and a decrease in income levels due to increasing enterprise costs and instability of production processes, which reduces the attractiveness of the industry for employees. In parallel, there is a structural imbalance in the labor market, when the available personnel do not meet the needs of enterprises in terms of qualification level.

Analysis of indicators of innovative and circular development demonstrates stable positive dynamics and acceleration of transformation processes in the industry (Fig. 4).

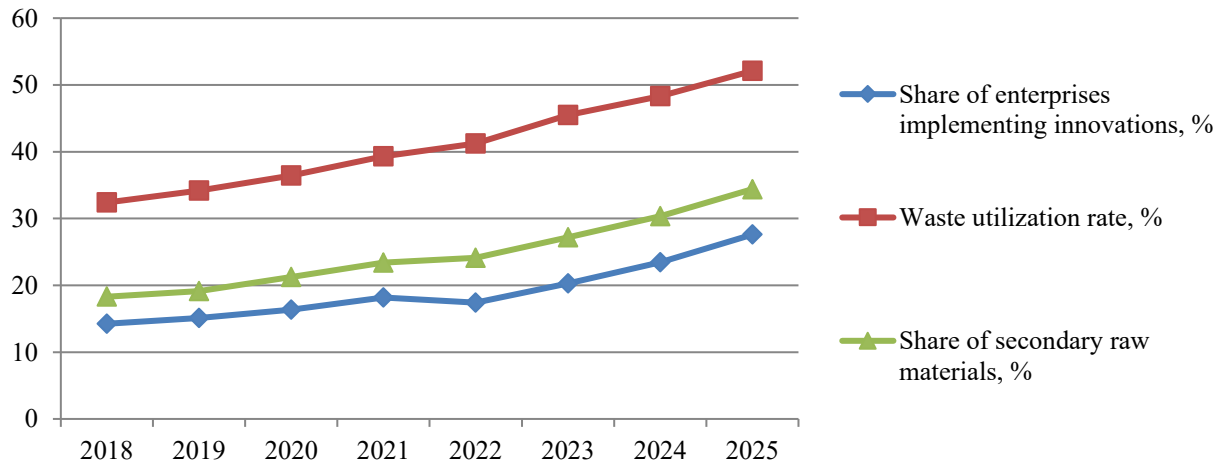

Figure 4. Indicators of innovative and circular development of food industry enterprises for 2018-2025, %

Source: compiled based on data [1-11; 17-19]

The share of enterprises implementing innovations increased from 14.25% in 2018 to 27.6% in 2025, i.e. almost doubled (+13 pp). A particularly noticeable increase in the indicator by 10 pp is observed after 2022, which indicates a forced innovative adaptation to crisis conditions. The level of waste utilization increased from 32.4% to 52.1%, which is one of the most significant results and means that more than half of the waste in 2025 is re-involved in the production cycle, which significantly reduces costs and environmental burden. The share of secondary raw materials used increased from 18.3% to 34.4%, which confirms the transition to closed production cycles. reintegration of resources into the production cycle.

The Circularity Index (Ic) is an integral and generalizing indicator that reflects the level of transition of food industry enterprises from a linear production model ("production of agricultural raw materials⇨production of processed products⇨waste") to a circular economy ("reduction⇨reuse⇨recycling-reintegration of resources into the production cycle")

In the context of the food industry, it characterizes the degree of waste utilization, the level of use of secondary raw materials, the innovativeness of environmental technologies, and the resource efficiency of production. The indicator shows how much the enterprise reduces dependence on primary resources and how effectively it processes waste into secondary resources, the level of environmental modernization of production, and the ability to achieve long-term competitiveness. The higher the IC, the lower the cost in the long term, the higher the resource sustainability, and the stronger the competitive position of food industry enterprises.

It should be noted that the integral circularity index of food industry enterprises in 2018-2025 increased from 0.35 to 0.65, i.e. by 85.7%, which is the highest growth rate among all indicators and indicates systemic changes in the production approaches of enterprises (Fig. 5).

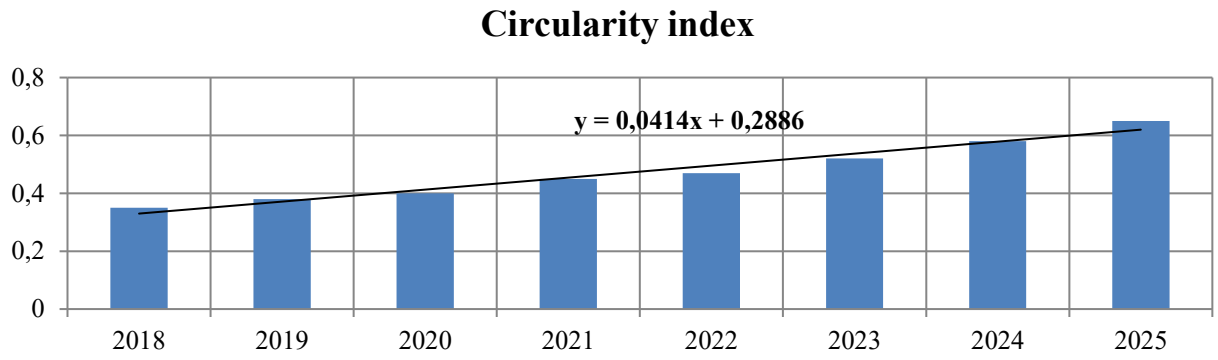

Figure 5. Circularity index of food industry enterprises for 2018-2025

Source: built based on data [1-11;17-19]

It is important that even in the crisis year of 2022, there is not a decline, but an increase in circular indicators, which confirms their anti-crisis role and the active implementation of a circular development model by food industry enterprises, which ensures cost reduction, increased resource efficiency, and the formation of long-term competitive advantages.

Conclusions. The conducted research shows that Ukrainian food industry enterprises are operating in conditions of deep transformations caused by military challenges, disruption of logistics chains, resource constraints and increased production costs. At the same time, the industry demonstrates the ability to adapt and partially recover, which is confirmed by the positive dynamics of performance indicators in recent years of economic development during martial law in the country. In particular, the growth of production volumes and sales of products, increased profitability, and a narrowing of the gap between production and sales opportunities indicate a gradual restoration of market balance. An important result is also structural shifts in resource supply, namely, a decrease in the energy intensity of production, partial stabilization of the state of fixed assets and gradual localization of the raw material base, which creates the prerequisites for increasing the internal stability of food industry enterprises.

Particularly significant is the accelerated development of innovation-circular processes, which is manifested in the growth of the circularity index, an increase in the level of waste utilization and the expansion of the use of secondary raw

materials. This confirms the transition of enterprises to a more resource-efficient development model, which ensures simultaneous cost reduction and increased environmental compliance of production with respect to the implementation of circular innovations, which acquire the status of an important tool for enhancing competitiveness in the conditions of a crisis economy. The prospects for further research will be aimed at determining the impact of circular innovations on the forecast trends of growth of competitive advantages, the development of industry mechanisms for their institutional support of industrial enterprises, as well as assessing the effectiveness of their integration into European circular value chains in the conditions of post-war economic recovery.

Література

1. Міністерство аграрної політики та продовольства України. Аналітика виробництва харчових продуктів. https://minagro.gov.ua (дата звернення: 03.05.2026).

2. Міністерство економіки України. Аналітичні матеріали щодо розвитку харчової промисловості. https://www.me.gov.ua (дата звернення: 03.05.2026).

3. Івченко В. М., Зірнзак О. С., Солошонок А.Л., Полонська О. М. Харчова промисловість України: аспекти воєнного часу. Київ: НДІ «Украгропромпродуктивність», 2024. 55 с.

4. Державна служба статистики України. Індекси промислової продукції за видами діяльності (виробництво харчових продуктів). https://www.ukrstat.gov.ua/operativ/menu/menu_u/prom.htm (дата звернення: 03.05.2026).

5. Державна служба статистики України. Індекси цін виробників промислової продукції у 2018 році. https://www.ukrstat.gov.ua/operativ/operativ2018/ct/icv_vp/icv_vp_u/icv_vp0118_u.htm (дата звернення: 03.05.2026).

6. Державна служба статистики України. Індекси цін виробників промислової продукції у 2019 році. https://ukrstat.gov.ua/operativ/operativ2007/ct/cn_rik/icv/icv_u/icvpp_u.html (дата звернення: 03.05.2026).

7. Державна служба статистики України. Індекси цін виробників промислової продукції у 2020 році. https://www.ukrstat.gov.ua/operativ/operativ2020/ct/icv_pm/icv_pm_u/icv_pm0120_u.html (дата звернення: 03.05.2026).

8. Державна служба статистики України. Індекси цін виробників промислової продукції у 2021 році: статистичний збірник. https://stat.gov.ua (дата звернення: 03.05.2026).

9. Міністерство фінансів України. Індекс цін виробників у 2022 році. https://index.minfin.com.ua/ua/economy/index/prodprice/2022/ (дата звернення: 03.05.2026).

10. Міністерство фінансів України. Індекс цін виробників у 2023 році. https://index.minfin.com.ua/ua/economy/index/prodprice/ (дата звернення: 03.05.2026).

11. Міністерство фінансів України. Індекс цін виробників у 2024 році. https://index.minfin.com.ua/ua/econo.my/index/prodprice/ (дата звернення: 03.05.2026).

12. Міністерство фінансів України. Індекс цін виробників у 2025 році. https://index.minfin.com.ua/ua/economy/index/prodprice/ (дата звернення: 03.05.2026).

13. Калетнік Г.М., Лутковська С.М. Екологічна модернізація та органічне виробництво в системі екологічної безпеки. Вінн. нац. аграр. ун-т. Вінниця: ВНАУ, 2022. 356 С.

14. Лагодієнко В.В., Артеменко Л.П., Лагодієнко В.В. Інноваційно-орієнтована стратегія підвищення конкурентоспроможності підприємств харчової промисловості. *Український журнал прикладної економіки та техніки.* 2023. № 2. С. 89-95.

15. Нісходовська О.Ю., Бялковська О.А. Конкурентоспроможність підприємства в умовах сталого розвитку: підходи та інструменти оцінювання. *Економічний простір*. 2026. №211. С. 45–56.

16. Омельченко Я., Обиход Г., Нечитайло Т. Екологізація виробництва як фактор модернізації виробництва. *Економіст*. 2016. №6. С. 24-27.

17. Державна служба статистики України. Сільське господарство України (сировинна база харчової промисловості). https://ukrstat.gov.ua/druk/publicat/kat_u/publ7_u.htm (дата звернення: 03.05.2026).

18. Державна служба статистики України. Статистичний щорічник України (промисловість, харчова галузь). https://ukrstat.gov.ua/druk/publicat/kat_u/publ1_u.htm (дата звернення: 03.05.2026).

19. Міністерство економічного розвитку і торгівлі України. Секторальна експортна стратегія харчової і переробної промисловості України на 2019-2023. https://me.gov.ua/download/40a91455-ab2b-479d-b52d-11ba5fef6784/file.pdf (дата звернення: 03.05.2026).

20. Міністерство фінансів України. Ціни виробників та ринки продукції (харчова промисловість). https://index.minfin.com.ua/ua/markets/ (дата звернення: 03.05.2026).

21. Baninla N. The effect of innovation on competitiveness in the food processing industry. *European scientific journal*. 2024. Vol. 20(4).

22. Bocken N.M.P. Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*. 2016. Vol. 33(5). P. 308–320.

23. Dora M., Gellynck X. Sustainable food supply chains. *Trends in Food Science & Technology*. 2015. Vol. 45(2). P. 154-162.

24. Dragan O. Strategies for enhancing the competitiveness of food industry enterprises. *Науковий вісник Херсонського державного університету. Секція «Економіка та управління підприємством»*. 2025. № 55. С. 5-11.

25. Henson S., Reardon Th. Private agri-food standards. *Food Policy*. 2005. Vol. 30(3). P. 241-253.

26. Galanakis C.M. Innovation strategies in the food industry. *Food Research International*. 2016. Vol. 89. P. 2-13.

27. Geissdoerfer M. The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production*. 2017. Vol. 143. P. 757-768.

28. Gorb O.A., Yasnolob I.A., Protsiuk N.Y. Organizational-economic mechanism of management of food industry enterprises competitiveness. *Annals of Agrarian Science*. 2016. Vol. 14(3). P. 191-195.

29. Kirchherr J. Conceptualizing the circular economy. *Resources, Conservation & Recycling*. 2017. Vol. 127. P. 221–232.

30. Łukiewska K.M. The importance of competitive potential in building the international competitiveness of food industry companies. *PLoS ONE*. 2024. Vol. 19(10).

31. Łukiewska K. Innovation and Industry 4.0 in building the competitiveness of food industry enterprises // Economics and Business Review. 2024. Vol. 10(3). P. 216-241.

32. Traill W.B., Meulenberg M. Innovation in the food industry. *Agribusiness*. 2002. Vol. 18(1). P. 1-21.

References

1. Ministry of Agrarian Policy and Food of Ukraine (2026), “Analytics of food production”, available at: https://minagro.gov.ua (Accessed 3 May 2026).

2. Ministry of Economy of Ukraine (2026), “Analytical materials on the development of the food industry”, available at: https://www.me.gov.ua (Accessed 3 May 2026).

3. Ivchenko, V. M., Zirnzak, O. S., Soloshonok, A. L. and Polonska, O. M. (2024), *Kharchova promyslovist Ukrainy: aspekty voiennoho chasu* [Food Industry of Ukraine: Wartime Aspects], Research Institute "Ukragropromproduktivnist", Kyiv, Ukraine.

4. State Statistics Service of Ukraine (2025), “Industrial production indices by type of activity (food production)”, available at: https://www.ukrstat.gov.ua/operativ/menu/menu_u/prom.htm (Accessed 3 May 2026).

5. State Statistics Service of Ukraine (2018), “Indices of industrial producer prices in 2018”, available at: https://www.ukrstat.gov.ua/operativ/operativ2018/ct/icv_vp/icv_vp_u/icv_vp0118_u.htm (Accessed 3 May 2026).

6. State Statistics Service of Ukraine (2019), “Indices of industrial producer prices in 2019”, available at: https://ukrstat.gov.ua/operativ/operativ2007/ct/cn_rik/icv/icv_u/icvpp_u.html (Accessed 3 May 2026).

7. State Statistics Service of Ukraine (2020), “Indices of industrial producer prices in 2020”, available at: https://www.ukrstat.gov.ua/operativ/operativ2020/ct/icv_pm/icv_pm_u/icv_pm0120_u.html (Accessed 3 May 2026).

8. State Statistics Service of Ukraine (2021), “Indices of industrial producer prices in 2021”, available at: https://stat.gov.ua (Accessed 3 May 2026).

9. State Statistics Service of Ukraine (2022), “Indices of industrial producer prices in 2022”, available at: https://index.minfin.com.ua/ua/economy/index/prodprice/2022/ (Accessed 3 May 2026).

10. Ministry of Finance of Ukraine (2023), “Producer Price Index in 2023”, available at: https://index.minfin.com.ua/ua/economy/index/prodprice/ (Accessed 3 May 2026).

11. Ministry of Finance of Ukraine (2024), “Producer Price Index in 2024”, available at: https://index.minfin.com.ua/ua/econo.my/index/prodprice/ (Accessed 3 May 2026).

12. Ministry of Finance of Ukraine (2025), “Producer Price Index in 2025”. https://index.minfin.com.ua/ua/economy/index/prodprice/ (Accessed 3 May 2026).

13. Kaletnik, G.M. and Lutkovska, S.M. (2022), *Ekolohichna modernizatsiia ta orhanichne vyrobnytstvo v systemi ekolohichnoi bezpeky* [Ecological modernization and organic production in the system of ecological safety]. Vinnytsia National Agrarian University, VSU, Vinnytsia, Ukraine.

14. Lagodienko, V.V., Artemenko, L.P. and Lagodienko, V.V. (2023), "Innovation-oriented strategy for increasing the competitiveness of food industry enterprises", *Ukrainskyi zhurnal prykladnoi ekonomiky ta tekhniky,* vol. 2. pp. 89-95.

15. Niskhodovska, O.Yu. and Byalkovska, O.A. (2016), "Competitiveness of an enterprise in the context of sustainable development: approaches and assessment tools". *Ekonomichnyi prostir*, vol. 211, pp. 45-56.

16. Omelchenko, Ya., Obykhod, G. and Nechytaylo, T. (2016), "Greening of production as a factor of production modernization", *Ekonomist*, vol 6, pp. 24-27.

17. State Statistics Service of Ukraine (2024), "Agriculture of Ukraine (raw material base of the food industry)", available at: https://ukrstat.gov.ua/druk/publicat/kat_u/publ7_u.htm (Accessed 3 May 2026).

18. State Statistics Service of Ukraine (2024"Statistical Yearbook of Ukraine (industry, food industry)", available at: https://ukrstat.gov.ua/druk/publicat/kat_u/publ1_u.htm (Accessed 3 May 2026).

19. Ministry of Economic Development and Trade of Ukraine (2023), "Sectoral Export Strategy of the Food and Processing Industry of Ukraine for 2019-2023", available at: https://me.gov.ua/download/40a91455-ab2b-479d-b52d-11ba5fef6784/file.pdf (Accessed 3 May 2026).

20. Ministry of Finance of Ukraine (2025), "Producer Prices and Product Markets (including Food Industry)", available at: https://index.minfin.com.ua/ua/markets/ (Accessed 3 May 2026).

21. Baninla, N. (2024), "The effect of innovation on competitiveness in the food processing industry", *European scientific journal*, vol. 20(4). https://doi.org/10.19044/esj.2024.v20n4p129.

22. Bocken, N.M.P. (2016), “Product design and business model strategies for a circular economy”, *Journal of Industrial and Production Engineering*. vol. 33(5), pp. 308-320.

23. Dora, M. and Gellynck, X. (2015), “Sustainable food supply chains”, *Trends in Food Science & Technology*, vol. 45(2), pp. 154-162.

24. Dragan, O. (2025), “Strategies for enhancing the competitiveness of food industry enterprises”, *Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Sektsiia «Ekonomika ta upravlinnia pidpryiemstvom»*, vol. 55, pp. 5-11.

25. Henson, S. and Reardon, Th. (2005), “Private agri-food standards”, *Food Policy*, vol. 30(3), pp. 241-253.

26. Galanakis, C.M. (2016), “Innovation strategies in the food industry”, *Food Research International*, vol. 89, pp. 2-13.

27. Geissdoerfer, M. (2017), “The Circular Economy – A new sustainability paradigm?” *Journal of Cleaner Production*, vol. 143, pp. 757-768.

28. Gorb, O.A., Yasnolob, I.A. and Protsiuk, N.Y. (2016), “Organizational-economic mechanism of management of food industry enterprises competitiveness”, *Annals of Agrarian Science*, vol. 14(3), pp. 191-195.

29. Kirchherr, J. (2017), “Conceptualizing the circular economy”, *Resources, Conservation & Recycling*, vol. 127, pp. 221-232.

30. Łukiewska, K.M. (2024), “The importance of competitive potential in building the international competitiveness of food industry companies”, *PLoS ONE*, vol. 19(10). https://doi.org/10.1371/journal.pone.0312512.

31. Łukiewska, K. (2024), “Innovation and Industry 4.0 in building the competitiveness of food industry enterprises”, *Economics and Business Review*, vol. 10(3), pp. 216-241.

32. Traill, W.B. and Meulenberg, M. (2002), “Innovation in the food industry”, *Agribusiness*, vol. 18(1), pp. 1-21.

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