

15. State Statistics Service of Ukraine (2020). *Commodity Pattern of Foreign Trade of Ukraine*. Available at: http://www.ukrstat.gov.ua/operativ/operativ2020/zd/tsztt/tsztt_u/tsztt0520_u.htm

16. State Statistics Service of Ukraine (2020). *Index of Industrial Production in Ukraine*. Available at: http://www.ukrstat.gov.ua/operativ/operativ2016/pr/ipp/ipp_u/arh_ipp_u.htm

17. State Statistics Service of Ukraine (2020). *Balances and consumption of the main food products by the population of Ukraine*. Available at: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/07/zb_bsoph2018_pdf.pdf; http://www.ukrstat.gov.ua/druk/publicat/Arhiv_u/07/Arch_spog_zb.htm

Abstract.

Dovgal O. World grain market: place and role of Ukraine.

Introduction. The article shows the increase in Ukraine's share in the world structure of grain exports. The average value of the growth rate of Ukrainian wheat and fodder grain exports is calculated, which is ahead of the similar world indicator. It turns out that the food supply of individual countries and regions depends on the volume of Ukrainian grain exports. It is noted that the positive side of the growth of grain exports is the increase in foreign exchange earnings, the negative - the loss of value added and reducing the use of grain for domestic needs.

Purpose. Substantiation of theoretical and methodological provisions of the grain market, study of the state, patterns, prospects of the grain market of national and regional nature and development of practical recommendations for improving the organizational and economic mechanism of its regulation through generalization of conceptual approaches and implementation of foreign experience.

Results. The article proves that the solution of the global food problem is connected with the production of grain products. Currently, the essence of this problem comes down to the fact that the growth rate of the world's population is ahead of the growth rate of grain production. In addition, the article substantiates how the negative impact of destructive factors on agricultural production is increasing - reducing the area of land suitable for agricultural production through construction and desertification, increasing freshwater shortages, increasing the frequency of floods, droughts and fires and increasing their distribution and more.

Conclusions. While maintaining the current demographic and climate trends, the risks of food danger are increasing even for countries that have traditionally been and are suppliers of grain products to the world market. For Ukraine, such risks are because the deepening integration of its economy into the world weakens the ability of public administration to influence the redistribution and movement of food in the national market - free trade policy is the basis of the neoliberal doctrine of economic globalization. In the worst-case scenario, the owners of grain products grown in Ukraine will be foreign agricultural holdings of TNCs, which will export it abroad without restrictions provoking an acute shortage of food in the domestic market with all the negative consequences.

Keywords: wheat, fodder grain, export, foreign exchange earnings, raw materials, value added, domestic use.

Стаття надійшла до редакції 12.04.2020 р.

Бібліографічний опис статті:

Довгаль О. В. Світовий ринок зерна: місце та роль України. Актуальні проблеми інноваційної економіки. 2020. № 2. С. 45-51.

Dovgal O. World grain market: place and role of Ukraine. Actual problems of innovative economy. 2020. No. 2, pp. 45-51.



УДК 338.23; JEL classification: O31

DOI: <https://doi.org/10.36887/2524-0455-2020-2-9>

**GORUSTOVICH Tatyana, Master of Economics, Senior Lecturer of the Department of Economics and Organization of Agricultural Enterprises, Belarusian State Agrarian Technical University
SHPAK Alexander Petrovich, Doctor of Economics, Professor, "Institute of System Research in the Agro-industrial Complex of the National Academy of Sciences of Belarus"**

INNOVATION ACTIVITY IN THE REPUBLIC OF BELARUS

Gorustovich T. G., Shpak A. P. Innovation activity in the Republic of Belarus.

The role of innovation in the modern world is difficult to overestimate. Innovations perform not only an economic function, but also cover all aspects of society's life and affect personal issues. In the long term, further economic and cultural growth along the intensive path of development is impossible without innovation. Currently, innovation is an active link in all spheres of society. It is impossible to imagine the modern world without implemented innovations, and without future ones that contribute to further evolution. In modern conditions, improving the efficiency of production can be achieved mainly through the development of innovation processes that are ultimately expressed in new technologies and new types of competitive products. Thus, the basis for the development of the country's economy is innovation, and the main guideline is the introduction of new technologies. Innovation has become a major driver of economic and social development. Innovative activity has brought the world society to a new and higher stage of development. The concept of "innovation" is used

almost everywhere. Innovation can be understood as the final result of innovative activity, which is embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practice, a new approach to social problems. In principle, the term "innovation" can be interpreted in different ways; it has an infinite number of formulations and definitions. This article reveals the concept of innovation and defines the role of innovation activity in improving production efficiency.

Conclusion. *Priority should be given to the development of the country based on enhancing innovative activities in the most knowledge-intensive and high-tech sectors of the national economy, which are the most significant and progressive engines for the development of the national economy. Orientation of the development of the national economy towards enhancing innovative activities using scientific methods and approaches is the key to the success and prosperity of the country, increasing the welfare and living standards of the population.*

Keywords: *innovation, innovation processes, innovation activity, innovation policy, statistics, competitiveness.*

Introduction. Innovation plays a significant role in the country's successful development. The competitiveness of the national economy in the modern world is largely determined by the knowledge economy, formed taking into account the country's innovative potential. It is almost impossible to create competitive products without innovation.

Innovation is one of the most important aspects that influence the country's economic development. Innovative processes in production serve as a condition for achieving success in world markets, increasing the level of welfare of citizens and society as a whole. Therefore, they should be an integral part of the state's economic strategy. In a market economy, innovations create new needs, attract investment, raise the rating of manufacturers of new products, and open new markets.

The economic aspects of the problem of innovative activity development are constantly in the focus of attention of many scientists and practitioners. In the ranks of the first researchers of innovation, it is necessary to single out such scientists as J. Schumpeter, W. Mitscherlich, V. Sombart, N. Kondratyev, P. Sorokin, B. Twiss, B. Santo, G. Shackle, T. Brian, D. Sakhal, H. Riggs, E. von Hippel, I. Pinings, J. Galbraith among the modern foreign researchers studying this topic.

The works of Zh.B. Say, R. Cantillon, J. von Thünen, F. Knight, K. Marx, A. Kirzner, F. Peru, P. Drucker, M. Weber, F. Hayek, R. Hirsch, A. Hosking made a significant contribution to the research innovative nature. Despite the fact, that many theoretical and methodological issues of the economic efficiency of innovation have been sufficiently developed in the works of Yu.V. Yakovets, L.E. Mindeli, Sh.R. Ageeva, C.B. Ermasova, I.V. Zhuravkova, P.N. Zavlina, Yu.P. Inozemtseva, V.G. Medynsky, A.I. Prigogine and other researchers, some of the problems of development and activation of innovative activity have not been sufficiently studied. At present, it should be recognized that innovative activity can become a real strategic resource, one of the main factors for ensuring sustainable

economic development and achieving a normal standard of living for the population.

The purpose of the study is to study and analyze the innovative processes taking place in the Republic of Belarus, and the main task is to assess the innovative potential of the country. In the course of the work, the methods of empirical and theoretical research were used. The combination of the methodological base used allowed us to ultimately ensure the reliability and validity of the conclusions.

Presentation of the main research material. Belarus, having chosen an innovative path of development, has determined the strategic goal of innovation policy - the formation of a competitive economy through the creation of new and modernization of existing high-tech and knowledge-intensive industries in various sectors of the country's economy. The strategy "Science and technology: 2018-2040" has been prepared and approved in the Republic of Belarus [1]. In connection with the implementation of the strategy, innovation activities are governed by the following theses: science is the basis of advanced technologies; innovations must meet global trends and the interests of society; it is necessary to reach a new level of competitiveness; research activities must rely on their own resources and on international scientific cooperation.

Belarus also approved a set of measures to develop the national innovation system for 2020. The corresponding resolution of the Council of Ministers No. 53 was signed on January 29, 2020. The list contains more than 50 names of events. The main ones are: development of proposals for the inclusion of norms aimed at stimulating interaction of business entities based on the cluster development model in the normative legal acts of the Republic of Belarus; implementation of sectoral plans for the organization of digital transformation of economic activities for 2020; development of state standards aimed at ensuring the implementation of the concept of digital transformation of the industrial sector; preparation of proposals on methods for stimulating the implementation of innovative projects within the

framework of state programs for innovative development; expansion of providing state financial support practice for the implementation of innovative projects in the form of innovative vouchers and grants; preparation of a draft decree of the President of the Republic of Belarus "on priority areas of scientific, scientific, technical and innovative activities for 2021-2025"; preparation of draft normative legal acts on the participation of the Republic of Belarus in international agreements in the field of intellectual property; attraction of foreign and domestic investments in the high-tech Park and the Chinese-Belarusian industrial Park "Great stone"; creation and development of technology transfer centers at higher education institutions, scientific organizations in Minsk, regional and the largest district centers.

All activities will contribute to the formation and accelerated development of high-tech sectors of the national economy, improving the system of financing and stimulating scientific, technical and innovative activities, improving the management systems of scientific, technical and innovative activities, and protecting and managing intellectual property. They will help in the development of innovative entrepreneurship and investment activities in the scientific, technical and innovative spheres, and will have a positive impact on improving the system of commercialization of scientific-technical activities and development of infrastructure in the fields of science, technology and innovation.

To date, there are examples of effective testing of modern innovations. In crop production, these are resource-saving technologies, No-till (zero tillage system), precision farming methods based on satellite navigation (GIS, GPS, Galileo), innovative potato production using Dutch technology, and the use of biodiesel [2]. In animal husbandry, these are production of pork with interbreeding of pigs according to the Dutch scheme, cultivation of high-quality "marble" beef, Dutch robotic technology in dairy farming, software for setting diets for feeding dairy cows, processing of manure and waste with the help of the red California worm [3].

Modern energy is an efficient refrigerating equipment with a total capacity of more than 168 MW has been introduced in meat and milk processing organizations, the use of which has allowed to reduce its ammonia capacity by more than 10 times. Cogeneration and regeneration plants with a total capacity of more than 30 MW are operating in 16 organizations of the Ministry of agriculture and food. The largest ones are at UE "Agrokombinat" Zhdanovichi "(9 MW), at

JSC "Molochny Mir" (3.4 MW), JSC "Berezovsky cheese factory", at UE "Borisovsky combine of bread products" and at JSC "Baranovichkhleboprodukt" (1 MW each), at JSC "Savushkin product" (2.6 MW), LLC "Primilk" (2.3 MW) [4].

Currently, innovative development results in the country are considered as an essential component of its economic growth and one of the main bright examples of innovation is the Hi-Tech Park (HTP). After the signing of the decree "on the development of the digital economy", 267 companies joined the HTP in 2018, more than in the entire 12 - year history of the Park. The work of a hundred companies has become more active, creating 5,000 new jobs over the past year. Together with the new companies, the Park has grown by 13 thousand employees. At the beginning of 2019, HTP residents employed 45.7 thousand people.

According to the decree (dated March 28, 2018), HTP residents are exempt from most taxes, including income tax, until January 1, 2049. Today, 454 companies are residents of the Hi-Tech Park. Their exports in 2018 grew by 38% compared to 2017 and amounted to \$1 billion 414 million. GDP growth in 2018 is about 0.5% of the 3.7% growth in the economy. The main consumers of HTP products are the EU and the USA: 91.9% of the software produced in the Park is exported, of which 49.1% is supplied to Europe, 44% to the USA and Canada, and 4.1% to Russia and the CIS. The total volume of HTP production amounted to 3 billion 202 million rubles, an increase of 47% compared to 2017 [5].

In the domestic market, residents developed and implemented solutions worth Br 297 million (59% more than in 2017). At the beginning of 2019, the network of technoparks covers all the regional centers of Belarus without exception, as well as the capital Minsk (table 1).

The next significant event was the creation of a robotic dump truck BELAZ-7513R with a load capacity of 130 tons due to cooperation with JSC "VIST Group", an international company in the field of development and implementation of information technologies for the mining industry and metallurgy [6]. The opto-electronic system ensures safe driving in all weather and climate conditions, as well as in the dark. The use of robots eliminates work interruptions due to lunch breaks and rest. The use of unmanned cargo vehicles that can operate almost around the clock can increase productivity by 15-20%.

At the moment, the most recent V-level autopilot is used on dump trucks and a person is still needed to train. When difficult conditions

occur, remote control is taken over by an operator who can simultaneously control several cars.

Table 1

Number of innovation infrastructure entities in 2019

Region	Number of innovation infrastructure entities in the region, units
Brest region	2
Vitebsk region	5
Gomel region	3
Grodno region	4
Minsk region	2
Mogilev region	3
Minsk	6

Artificial intelligence captures the algorithms of actions when an extreme situation

occurs, so that the next time it solves the problem itself. In 2018, two robotic BelAZs began operating in test mode in Khakassia, in 2019 - in the markets of Peru and Chile, where mining is carried out high in the mountains, and in 2020 - in South Africa.

Result and discussion. The main influence on the level of innovation activity in the country is provided by industrial organizations. Organizations that spend on technological innovations are considered to be innovation-active. Table 2 gives a definite idea of their innovative activity in 2002-2017 [7].

The data analysis shows an unstable growth of innovation activity of industrial organizations in Belarus.

Table 2

Main indicators of innovation activity of industrial organizations

Indicators	2002	2006	2011	2015	2017
Number of organizations that implement technological innovations, units.	50	55	67	44	49
The share of organizations that implement technological innovations in the total number of organizations, %	11,4	12,4	17,8	12,7	15,2
Expenditures on technological innovations, billion rubles	84,8	215,8	299,6	721,4	196,9
The share of shipped innovative products (works, services) in the total volume of shipped products (works, services), %	14	14,3	12,4	7,8	12,1

Despite the fact that the share of innovative-active organizations in 2002-2017 increased from 11.4% to 15.2%, this is less than the average for the EU-27, where 39.8% of enterprises were recognized as innovative-active in the field of technological innovations [8]. Low innovative activity of industrial enterprises in Belarus led to the fact that in 2002-2017, the number of the share of shipped innovative products of enterprises in the total volume of shipped products remained at a fairly low level (table 2) so in 2017 was only 12.1% while in 2015 it was 12.4% [9]. The main contribution to the innovative activity of the Republic is made by large industrial enterprises, but at the same time, world experience shows that small enterprises can make a significant contribution to the intensification of innovative processes. Small enterprises still cannot have a significant impact on the growth of the overall level of innovation activity of Belarusian enterprises, since the initiators of innovation processes are usually large organizations. In recent years, organizational and marketing innovations have become particularly important for improving the efficiency of innovation activities in industrially developed countries. In the practice of domestic enterprises, they have not taken their proper place yet, which also limits the growth of the overall level of innovation activity of the economy. Most industrial enterprises in Belarus prefer to purchase machinery and equipment.

Thus, this period can be characterized in general by the positive dynamics of innovative potential indicators of the economy of the Republic of Belarus. Moreover, in the perspective of its development, the following directions can be proposed: strengthening human potential due to the growing number of highly qualified personnel and researchers; preservation of the positive dynamics in the number of organizations creating advanced production technologies; creation of high technology zones. It should be outlined that innovation is an area that not only increases the country's competitiveness, but also creates a certain image for it, raises economic growth in the country, and at the same time, the standard of living of the population.

The EU methodology is of particular interest now. The methodology of the national Innovation Union allows us to analyze the ability of the personnel potential to perceive innovations, the level of personnel qualification, the level of financing of innovation activities and the economic effects of this activity. Individual indicators of the Innovation Union are also calculated in the EEU countries, which allows us to compare the indicators of innovation development with the average for the EU countries. Belarus does not participate in the evaluation of the European innovation scoreboard, but the statistical capabilities based on international standards for statistical observation allow us to compare

Belarus positions in many indicators of the European innovation index. The efficiency of the Belarusian innovation sector is quite high (table 3).

Table 3

Positioning of the Republic of Belarus in the context of the European innovation scoreboard [10]

Total innovation index	Efficiency relative to the EU-2010		Compared to the EU in 2017
	2010	2017	2017
Belarus	52,5	60,7	52,5
Russia	47,0	51,0	49,0

According to the calculations, the efficiency of the innovation system has increased from 52.5% to 60.7%. In addition, at present Belarus is starting to form innovative industries of the VI technological order. This is provided by the draft strategy "Science and Technology: 2018-2040", the implementation of which will make it possible to achieve the following indicators: internal expenditures on research and development will amount to 2.5-3% of GDP; breakthrough research and development will receive 30% of these costs; the share of high-tech sectors in the structure of the economy will reach 10%; the share of innovative products in the total volume of shipped industrial products will approach 25%. These measures will ensure the

achievement of high results corresponding to the world level, will form the basis for effective research activities, and will help to increase the competitiveness of the economy.

Conclusion. Thus, positive dynamics in the field of innovation is confirmed not only by the introduction of scientific and technical programs and projects, but also by the improvement of the innovation infrastructure and the existence of a unified regulatory framework. Today, we can claim that building a modern and effective innovation economy in Belarus is only a matter of time. In the general system of economic relations, innovative activity plays a key role, since its final results are determined in modern conditions by the economic power of the country. Moreover, priority should be given to the development of the country based on enhancing innovative activities in the most knowledge-intensive and high-tech sectors of the national economy, which are the most significant and progressive engines for the development of the national economy. Orientation of the development of the national economy towards enhancing innovative activities using scientific methods and approaches is the key to the success and prosperity of the country, increasing the welfare and living standards of the population.

Література.

1. Стратегия «Наука и технологии: 2018 -2040». URL: <http://nasb.gov.by/congress2/strategy>
2. Ведущие инновации Республики Беларусь в 2018 году. URL: <http://vestnikprom.by>.
3. *Шершеневич В. С.* Оценка эффективности инновационной деятельности в Республике Беларусь. *Молодой ученый*. 2017. № 50. С. 194-197.
4. Инновационные технологии в Беларуси: инвестиции, наука, техника. Технологии. Новая продукция. URL: www.scienceportal.org.by.
5. Инновационное развитие Республики Беларусь: состояние и перспективы. Интернет Портал Республики Беларусь. URL: <http://belisa.org.by>
6. Состояние и перспективы инновационного развития экономики. Экономико-аналитический Интернет журнал. URL: <http://mellow-mails.com>
7. Основные показатели инновационной деятельности организаций промышленности. URL: <https://minsk.belstat.gov.by>
8. О научной и инновационной деятельности в Республике Беларусь в 2016 году: статистический бюллетень. Минск: Национальный статистический комитет Республики Беларусь, 2017. 115 с.
9. О научной и инновационной деятельности в Республике Беларусь в 2017 году: статистический бюллетень. Минск: Национальный статистический комитет Республики Беларусь, 2018. 133 с.
10. *Богдан Н.И.* Национальная инновационная система Беларуси в системе Европейских индикаторов инноваций. *Белорусский экономический журнал*. 2019. N 3. С. 4-17.

References.

1. Strategija «Nauka i tehnologii: 2018 -2040». Strategy "Science and technology: 2018-2040". Available at: <http://nasb.gov.by/congress2/strategy>.
2. Vedushhie innovacii Respubliki Belarus' v 2018 godu. Leading innovations of the Republic of Belarus in 2018. Веб-сайт. Available at: <http://vestnikprom.by>.
3. *Shershenevich, V.S.* (2017). «Assessment of the effectiveness of innovative activity in the Republic of Belarus». *Molodoj uchenyj*. no. 50, pp. 194-197.

Інноваційні технології інтеграційної та комерційної взаємодії суб'єктів аграрного ринку

4. Innovacionnyye tehnologii v Belarusi: investicii, nauka, tehnika. Tehnologii. Novaja produkcija. Innovative technologies in Belarus: investment, science, technology. Technologies. New product. Available at: www.sciencereportal.org.by.

5. Innovacionnoe razvitie Respubliki Belarus': sostojanie i perspektivy. Internet Portal Respubliki Belarus'. Innovative development of the Republic of Belarus: state and prospects. Internet Portal of the Republic of Belarus. Available at: <http://belisa.org.by>.

6. Costojanie i perspektivy innovacionnogo razvitija jekonomiki. Jekonomiko-analiticheskij Internet zhurnal. State and prospects of innovative development of the economy. «Economic - analytical online journal». Available at: <http://mellow-mails.com>.

7. Osnovnye pokazateli innovacionnoj dejatel'nosti organizacij promyshlennosti. Main indicators of innovation activity of industrial organizations. Available at: <https://minsk.belstat.gov.by>.

8. *O nauchnoj i innovacionnoj dejatel'nosti v Respublike Belarus' v 2016 godu: stati-sticheskij bjulleten'* [On scientific and innovative activities in the Republic of Belarus in 2016: statistical Bulletin]. (2017). «National statistical Committee of the Republic of Belarus». Minsk. Belarus.

9. *O nauchnoj i innovacionnoj dejatel'nosti v Respublike Belarus' v 2017 godu: stati-sticheskij bjulleten'* [On scientific and innovative activities in the Republic of Belarus in 2017: statistical Bulletin] (2018). «National statistical Committee of the Republic of Belarus». Minsk. Belarus.

10. **Bogdan, N.I.** (2019). «National innovation system of Belarus in the system of European indicators of innovation». *Belorusskij jekonomicheskij zhurnal*. no. 3, pp. 4-17.

Анотація.

Горустович Т. Г., Шпак О. П. Інноваційна діяльність в Республіці Білорусь.

Роль інновацій в сучасному світі важко переоцінити. Інновації виконують не тільки економічну функцію, а охоплюють всі сторони життя суспільства, зачіпають особистісні питання. У довгостроковій перспективі без інноваційної діяльності неможливий подальший економічний і культурний інтенсивний розвиток. В даний час інновації є активною ланкою всіх сфер життєдіяльності суспільства. Неможливо уявити сучасний світ як без існуючих інновацій, так і без майбутніх, які сприяють подальшій еволюції. В сучасних умовах підвищення ефективності виробництва можна досягти переважно за рахунок розвитку інноваційних процесів, які отримують кінцеве вираження в нових технологіях, нових видах конкурентоспроможної продукції. Так, основою розвитку економіки країни є інновація, а головним орієнтиром є впровадження нових технологій. Інновації перетворилися в основну рушійну силу економічного і соціального розвитку. Інноваційна діяльність призвела світове співтовариство до нового вищого щабля розвитку. Поняття «інновації» використовується практично всюди. Під інновацією можна розуміти кінцевий результат інноваційної діяльності, втілений у вигляді нового або вдосконаленого продукту, впровадженого на ринку, нового або вдосконаленого технологічного процесу, використовуваного в практичній діяльності, нового підходу до соціальних проблем. В принципі, термін «інновації» можна трактувати по-різному, він має нескінченну кількість формулювань і визначень. У даній статті розкрито поняття інновації і визначена роль інноваційної активності в підвищенні ефективності виробництва.

Висновок. Пріоритет слід надавати розвитку країни на основі активізації інноваційної діяльності в найбільш наукоємних і високотехнологічних секторах національної економіки, які є найбільш значущими та прогресивними двигунами розвитку національної економіки. Орієнтація розвитку національної економіки на активізацію інноваційної діяльності з використанням наукових методів і підходів є запорукою успіху та процвітання країни, підвищення рівня добробуту та рівня життя населення.

Ключові слова: інновація, інноваційні процеси, інноваційна діяльність, інноваційна політика, статистика, конкурентоспроможність.

Стаття надійшла до редакції 10.03.2020 р.

Бібліографічний опис статті:

Горустович Т. Г., Шпак О. П. Інноваційна діяльність в Республіці Білорусь. Актуальні проблеми інноваційної економіки. 2020. № 2. С. 51-56.

Gorustovich T. G., Shpak A. P. Innovation activity in the Republic of Belarus. Actual problems of innovative economy. 2020. No. 2, pp. 51-56.

