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Selected Issues of socio-economic development in Poland and Ukraine

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Płock -2020

Scientific editing
Marlena Piekut
Nataliia Smentyna

Warsaw University of Technology
The College of Economics and Social Sciences

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IN POLAND AND UKRAINE**

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Chapter 6

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THE ATTRACTION OF INNOVATIONS IN ORDER TO IDENTIFY RESERVES THAT CAN INCREASE COMPETITIVENESS IN UKRAINIAN AND POLISH FOOD INDUSTRY ENTERPRISES

Abstract: The purpose of this article is to explore the possibilities of attracting innovations to identify reserves that can increase the competitiveness of enterprises on the example of Ukrainian and Polish enterprises. It was chosen as a scientific hypothesis that innovations can help identify reserves to increase the competitiveness of enterprises. The subject of scientific research was, that probable innovations that can be involved in the confectionery industry in order to identify various reserves as untapped opportunities. The calculations are based on economic and statistical methods that allowed for a comparative analysis of the enterprises of the two countries and to determine indicators for evaluating innovations. It was determined that innovations can help identify reserves to increase the competitiveness of enterprises. This thesis is based on a review of the scientific literature on the topic, and to verify it, the study was based on the method of calculating the economic efficiency of innovation. A comparative analysis of the selected coefficients for calculating the definition of innovation activity showed a close relationship between innovation and the identification of reserves. The experience of Poland confirms this statement. The proposed scientific hypothesis that innovations can help identify reserves to increase the competitiveness of enterprises needs further confirmation. But there are positive arguments that innovation has a significant impact on the identification of reserves. On the example of Poland, this is manifested in the reduction of the number of people working in production and the stable state of the average number of employees in research and development departments with a larger than in Ukraine, the volume of sold innovative products of the food industry.

Keywords: innovations, reserves, competitiveness, coefficient of product development, coefficient of product renewal, coefficient of personnel employed in research and development, sales volume, food industry enterprises, innovative products.

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INTRODUCTION

The study is based on the thesis, that deals with the attraction of innovation to identify reserves that can increase the competitiveness of enterprises. On the example of the activity of Ukrainian and Polish enterprises, a comparative analysis of attracting innovations to find

reserves was conducted. The urgency of this issue is to find untapped opportunities in enterprises, which will increase their level of competitiveness, using innovative approaches in various fields – management, organizational, personnel, production, resources, and so on. The article considers the peculiarities of the confectionery industry, namely, cocoa, chocolate and sugar confectionery. After all, these companies, both in Ukraine and in Poland, work on imported raw materials, which is due to the problems of the world cocoa market. Therefore, the invention of reserves can increase the competitiveness of these enterprises.

Based on the described situation, the aim of the article is to study innovations to identify reserves that can increase the competitiveness of enterprises on the example of Ukrainian and Polish enterprises.

As a scientific hypothesis, it was chosen that innovations can help identify reserves to increase the competitiveness of enterprises.

The subject of scientific research is the probable innovations that can be involved in the confectionery industry, namely, production and sale of cocoa, chocolate and sugar confectionery, and will contribute to the invention of untapped opportunities for efficiency and competitiveness and depend on the development of science and technology, as well as management in enterprises.

Theoretical perspectives of the study include the patterns of the relationship between innovation and reserves of enterprises; assessment of the involvement of innovation processes to identify potential reserves to increase the competitiveness of enterprises.

LITERATURE REVIEW AND PROBLEM STATEMENT

The study is based on scientific works of Ukrainian, Polish and other specialists. The interpretation of "innovation" is based on the definitions of J. Schumpeter and F. Kotler and co-authors. J. Schumpeter in his work "Theory of Economic Development" considered the impact of innovation on further economic development and proposed a definition of the innovation process. The definition of "innovation" was seen by the scientist as a change that is the main source of profit and which is the result of the introduction of innovations and derived a close, inverse relationship between development and profit. In this case, the innovation J. Schumpeter meant a change in order to introduce and use new types of goods, tools, markets and forms of organization (Schumpeter, 2007). F. Kotler, G. Armstrong, J. Saunders and W. Wong in "Fundamentals of Marketing", considering the content and role of marketing, emphasize the importance of innovation for enterprise development and define them as an idea, product or technology launched into mass production and presented at market, which the

consumer perceives as completely new or one that has certain unique properties (Kotler, Armstrong, Saunders, Wong, 2000, p. 589). In modern science, the concept of "innovation" has acquired a newer definition and reference to the economy as a whole or to individual areas of activity or enterprises. Thus, D. Sikora and A. Uzibło, considering innovations in the enterprise, emphasize the close interaction between innovations and "improvement and modernization of production procedures, increasing efficiency, production capacity and quality of work, improving the form and value of goods and their competitiveness, development and improvement in operational skills and efficiency, elimination of restrictions and mobilization of resources..". In the study "Innowacja w przedsiębiorstwie – próba zdefiniowania" the authors note the specificity of innovative activities of enterprises and a narrow understanding of innovation in business practitioners, which requires more meticulous research, taking into account the significant differences between scientific considerations and business approach (Sikora, Uziębło, 2013). A. Shpynek, based on the analysis of interpretations of the concept of "innovation" in the publication "Innowacyjność - definicja, ogólne informacje o innowacyjności w regionie", emphasizes the use of the term as "innovation, discovery" for further development and emphasizes that at the enterprise level innovations are an important factor in the formation of competitive advantage, helping to improve processes and products and, as a result, help strengthen the market position and increase the value of the company (Śpionek).

Shvatska-Mokrychka J. (2017) identifies the most important factors influencing the competitiveness of food industry enterprises: the number and differentiation of enterprises, product differentiation, saturation of food needs, technological progress. The author considers the possibility of introducing innovations to create a competitive position of the food industry, taking into account the leading factors to increase competitiveness (Szwacka-Mokrzycka J., 2017, p. 208–210).

M. Krashevskaya and K. Pucher (2017) emphasize that companies looking for sources of competitive advantage should try to adapt traditional and new concepts of competitiveness for a particular business and economic sector, as well as take into account the current operating conditions in this market (Krashevskaya, Pucher, 2017, p. 16).

Juchniewicz M. (2008), based on the analysis of food industry enterprises in Poland, notes that they most often use a strategy of competition for value, which is the result of access to relatively cheap factors of production. Such a competitive position is strategically unfavorable and one of the important tools of competition can be the quality of products (Juchniewicz, 2008).

In today's highly competitive environment, it is extremely important to identify possible reserves that will identify ways to develop enterprises and are closely linked to the implementation of innovations. In this approach, A.M. Omarov interprets reserves as untapped opportunities to improve production and improve performance as a result of scientific and technological progress, advanced organization of production and labor, dissemination of experience of the best teams, as well as eliminating losses of production resources (Omarov, 1985). L.V. Hrynevetska in the article "Reserves to increase the competitiveness of the enterprise" emphasizes that such reserves are considered as untapped opportunities for development, through the use of effective economic methods, and it is appropriate to divide the set of reserves of enterprise competitiveness into losses due to irrational use of its own potential and foreign market environment and new opportunities for advanced development of equipment, technology, best practices, management methods, market and non-market conditions" (Grinevetskaya, 2010, p. 249). Sometimes the reserves of competitiveness of the enterprise are combined with reserves – stocks of inventory necessary for the production of competitive products. We believe that this is an inappropriate comparison. The fact is that the same company with the same stock of inventory, similar qualities and composition, can create products of completely different degree of competitiveness. And this will be determined not only and not so much by the quantity and quality of stocks of raw materials, semi-finished products and the like, but by how effectively and adequately in the market situation the internal potential of the enterprise is used.

I.M. Kirchata and O.M. Shershenyuk "understands reserves as fully untapped opportunities of the enterprise, related to the reduction of production costs and ensuring activities in a competitive market. The composition of reserves may change: innovations related to production, organization and management of the enterprise cause the emergence of new types of reserves" (Kirchata, Shershenyuk, p. 69). One cannot but agree with the statement: "the main factor of potential internal reserves of the enterprise, which affects the level of competitiveness, is the degree of technical and technological perfection of production. To solve the problems of increasing competitiveness through resource conservation in the spheres of production and consumption within the production system of the enterprise it is necessary to constantly modernize and introduce new technologies as priority areas in the field of production" (Kirchata, Shershenyuk, p. 72).

The connection between innovations and reserves at enterprises is also traced by OS Malyutin and Yu.G. Nikiforov in the publication "Innovation - a condition for the formation and use of efficiency reserves", noting that innovation, on the one hand, is due to the presence

of reserves, on the other - it contributes to their formation and thus becomes a condition for long-term sustainable development, i.e. the following logical chain: reserves – innovations – resource conservation – innovations – reserves" (Malyutin, Nikiforov, 2013, p. 362).

Thus, the point of view is widespread in the scientific literature, when reserves are considered as a potential opportunity for more efficient use of resources (Komov, 2009, p. 42) or attracting untapped opportunities, which is possible through the introduction of innovations. Thus, to solve this goal in further research we will rely on the second approach.

It is especially important to consider increasing competitiveness from the standpoint of finding reserves for the food industry, due to the specifics of production, short-term properties of the final product, its quality and so on.

METHODS AND METHODOLOGY

Innovative activity is able to increase the competitiveness of enterprises by identifying reserves. But, at the same time, the introduction of innovations requires significant costs and a high degree of risk. Therefore, there is a need to assess the economic efficiency of innovation in enterprises. It is based on methods of calculating the economic efficiency of innovation, which are proposed by scientists, but often preference is given to industrial enterprises that produce their own innovative products, have special departments and staff performing research and development work. Based on the elaboration of existing methods (Karmazina, 2015; Zhukovich, Prilipko, Bilokon, 2014), selected individual parameters and coefficients that allow to determine the existing situation regarding the attraction of innovations in the food industry:

– the ratio of personnel employed in research and development, which characterizes the professional staff of the enterprise and shows the share of personnel directly involved in the development of new products and technologies, production and engineering design, other types of technological preparation for production or introduction of new products or implementation of new services, relative to the average list of all permanent and temporary employees of the enterprise. This ratio is determined by the formula:

$$K_{np} = \frac{U_i}{U_n}, \quad \text{Formula 1}$$

where U_i – number of persons employed in the field of research and development, persons;

U_n – the total number of employees of the enterprise, persons;

– the product renewal ratio – reflects the share of new products in total sales of the enterprise. Based on this indicator, it is appropriate to draw a conclusion about the feasibility

of financing innovation, because new products are usually competitive and usually, there are no problems with its sale, considering that the marketing service works effectively. It is calculated by the formula:

$$K_{OI} = \frac{O_{BHI}}{O_{3OI}}, \quad \text{Formula 2}$$

where: K_{OI} – product renewal rate;

O_{BHI} – quantity of new product types, units;

O_{3OI} – total number of marketable product, units;

– the coefficient of development of new products makes it possible to assess the ability of the enterprise to implement innovative or subjected to technological change products and is calculated by the formula:

$$K_{HI} = \frac{BP_{HT}}{BP_3}, \quad \text{Formula 3}$$

where: BP_{HT} – profit from the sale of new or improved products and products manufactured using new or improved technologies, UAH;

BP_3 – profit from the sale of all products of the enterprise, UAH;

The use of the outlined coefficients for the evaluation of innovation allows to take into account more accurately all the results and consequences that are expected from its implementation in enterprises, and to make rational decisions about the feasibility of implementation.

Resource assessment was conducted to identify reserves based on the involvement of innovations. It is carried out in order to determine the impact of innovation on the consumption of a particular type of resource and to overcome the problem of scarcity (important in the case of scarce or non-renewable resources, especially those that are imported).

RESEARCH RESULTS

Ukraine and Poland are two Central-Eastern European countries that are very close in terms of geographical location. In addition, both countries have a well-developed transit network. The economic development of both countries, natural resources and the current economic structure open wide prospects for cooperation and trade. Therefore, it is appropriate to compare the activities and implementation of innovations in Ukrainian and Polish food companies in order to share experiences and identify untapped opportunities. However, Poland has been a member of the European Union since 2004, which has had a significant

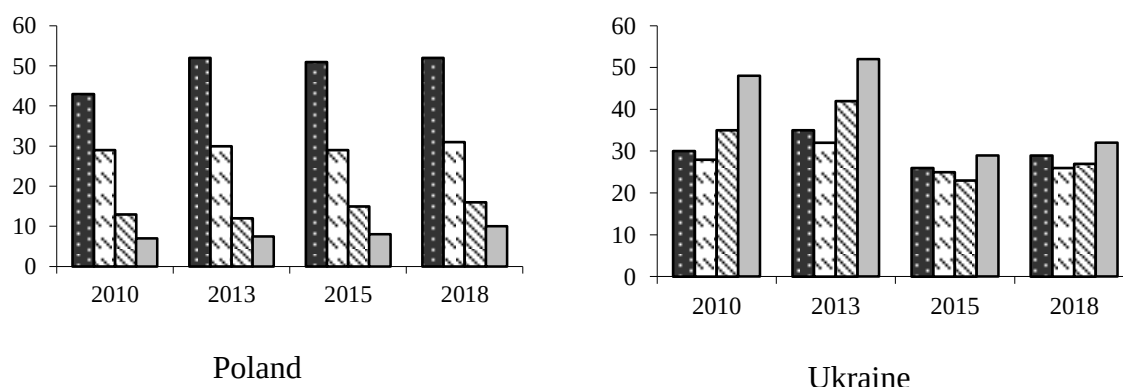
impact on the further development of the country's economy, including restructuring and modernization in the food industry, and this has had a major impact on the competitiveness of enterprises. Therefore, having studied the experience of Poland, Ukrainian producers can borrow already developed innovations and implement them in their activities, attracting foreign investment.

The food industry has a complex structure and contains more than 20 industries, the leading ones in Ukraine are: sugar, meat, dairy, oil and animal fat, fruit and vegetable canning, confectionery, alcohol, wine, etc. The share of the food industry, which includes the production of food, beverages and tobacco products, in the sales structure of Polish industry as a whole is about 20%. It employs almost 17% of the total number of people employed in the industry. More than 30 thousand entities declare activities in the field of processing, agricultural products, but only almost fifteen hundred enterprises employ 50 or more people. The rest are small organizations that operate in a very narrow range and sell goods in local markets. In Poland, the food industry is overwhelmingly private. Cocoa, chocolate and sugar confectionery products are usually produced by foreign enterprises or imported. The Polish confectionery market is dominated by products of international companies such as Nestle, Ferrero, Mars, Storck, Haribo, Lindt & Sprungli, Bahlsen Sweet, Perfetti Van Melle and their combined market share is 65%. The goods of Polish brands are represented in the minority, for example, such companies as Jutrzenka, Wawel, Mieszko, Solidarnosc, Wedel, the remaining 18% of the market is occupied by small producers (News & Analysis on Chocolate, Candy and Biscuit).

The largest sector of the confectionery industry is occupied by the chocolate segment, which in value terms accounts for 60% of the sweets market in Poland. According to marketing company AC Nielsen, sales of chocolate products reached 1.05 billion euros. Compared to the previous year, there was an increase in volume by almost 7% and an increase in value by 15.3% (News & Analysis on Chocolate, Candy and Biscuit). In Ukraine, in terms of production of cocoa, chocolate and sugar confectionery, due to the introduction of innovations at enterprises such as Roshen Corporation and CJSC AVK, this industry ranks third in terms of technological innovation costs, their products are increasingly exported to various countries of the world. Unfortunately, the historically traditional for Ukraine sugar industry is declining more and more and the funding for innovation is significantly reduced every year. This is due to the fact that the production of sugar from beets is expensive and the existing production capacity needs to be transferred to other types of raw materials, such as

raw cane. In addition, Russia was the main importer of Ukrainian sugar, and events in the east and the annexation of Crimea led to the cessation of these trade relations.

In the confectionery market, chocolate is presented in different forms, the sales of which are not the same. The percentage of sales of chocolate products in Poland and Ukraine is shown in Graph 1.



GRAPH 1. DYNAMICS OF SALES OF VARIOUS CHOCOLATE PRODUCTS: CHOCOLATE IN TILES, CHOCOLATE BARS, CANDY BOXES, CANDY BY WEIGHT, 2010-2018, %

Source: calculated according to Statistics of Ukraine.

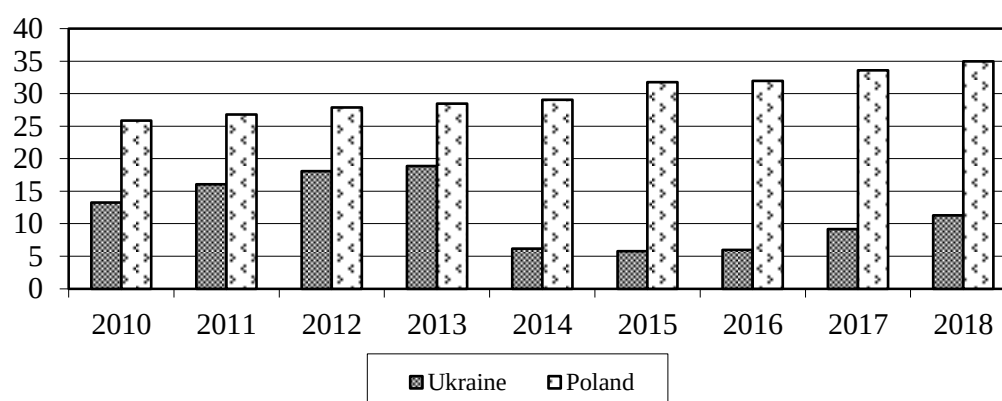
As you can see from Figure 1, both the composition and sales in different countries and over the years are different, due to many factors: economic development, traditions, and so on.

The introduction of the latest machinery and production technology in the food industry contributes to improving the quality of industrial products and increasing its level of competitiveness in both domestic and foreign markets. Active investment and innovation policy of the food industry includes technical re-equipment, modernization, optimization of existing production facilities for the production of modern competitive products and more.

Analyzing the volume of sold innovative products of the food industry of Ukraine and Poland for the period from 2010 to 2018, we use the coefficient development of new products, which allows to assess the ability of individual industries to implement innovative or technological products (Graph 2).

As for the production of oil and animal fat, since 2010 the coefficient of development of new products is reduced, and in 2013 it reached its lowest level (in Poland), and in Ukraine – in 2014. Then gradually, not rapidly, this graph is growing in both countries. This suggests that in this area of the food industry there have been no significant innovative changes in products, as most of the products are sold as raw materials to other countries. Investigating

sugar production, we see a tendency to significantly reduce innovation in this area, especially in recent years. In the production of bread and bakery products we note a similar trend, in 2014 the rate of development of new products was very low compared to previous years. The confectionery industry (especially the production of rusks, cookies and cakes) is marked by some positive changes: in recent years, the development of new products has doubled.



GRAPH 2. SALE VOLUME OF INNOVATIVE PRODUCTS OF FOOD INDUSTRY OF UKRAINE AND POLAND, 2010-2018, %

Source: calculated according to Statistics of Ukraine,

For further research, there were performed calculations of the ratio of personnel employed in research and development work (Table 1).

TABLE 1. DYNAMICS OF THE AVERAGE NUMBER OF EMPLOYEES EMPLOYED IN THE FOOD INDUSTRY OF UKRAINE AND POLAND, 2010-2018.

Indicators	2010	2013	2014	2015	2017	2018
The average number of full-time employees, persons	651531	623753	608845	561207	575880	603836
	14500	10456	9853	9500	8966	9527
The average number of employees in research and design departments, individuals	1870	1772	1385	761	582	240
	4836	3485	3284	3166	2988	3176
K_{np}	0,003	0,003	0,002	0,001	0,001	0,0004
	0,334	0,333	0,333	0,333	0,333	0,333

Source: calculated according to Statistics of Ukraine

As we can see, with the growth of the average number of full-time employees in Ukraine (data of the upper line), the number of employees engaged in research and design

work decreases, which critically affects the dynamics of the indicator. The reason for this trend is the outflow of highly qualified personnel and scientists abroad and the need for large investments in innovation and, consequently, the high risk of innovation. This means that in the economy of Ukraine there is no tendency to develop in the direction of innovation, often outdated equipment and technologies are used, no attention is paid to the fundamental implementation of innovations. In Poland, there has been a decrease in the number of employees in production (lower-line data), but the average number of employees in research and design departments, according to the calculated coefficient, remains stable.

The results of calculations of the coefficient in development of new products in the food industry are presented in table 2.

TABLE 2. SALE VOLUME OF INNOVATIVE PRODUCTS OF FOOD INDUSTRY IN UKRAINE AND POLAND, 2010-2018.

Indicators	2010	2013	2014	2015	2017	2018
Volume of shipped products (goods & services), thousand UAH	33121780,5	41655693,2	48244716,1	61193769,4	79052351,8	91359878,6
	38265780,6	46855367,3	52338873,3	73267826,8	86275323,3	96279926,5
Volume of shipped innovative products (goods & services), thousand UAH	20549524,6	24937648,4	27079032,8	1621251,5	2385983,1	3331863,4
	32565728,4	33266542,3	33289763,2	34256241,5	34729756,2	35266723,8
K_{HI}	0,62042	0,59866	0,56128	0,02649	0,03018	0,03647
	0,85104	0,79891	0,69002	0,46755	0,40255	0,38602

Source: calculated according to Statistics of Ukraine.

The coefficient of development of new products in the food industry indicates a tendency to a gradual decrease, which demonstrates the inability of the enterprise to implement innovative or subject to technological change products.

Calculations of the coefficient of product renewal in Ukraine are given in table 3.

**TABLE 3. VOLUME OF IMPLEMENTED INNOVATIVE PRODUCTS OF UKRAINE FOOD
INDUSTRY, 2010-2018**

Indicators	2010	2013	2014	2015	2017	2018
Total quantity of marketable products, thousand UAH	202348872,2	255274009,5	316284177,0	378060053,4	463259615,2	487035010,0
Introduction of innovative products, thousand UAH	404697,7	510548,02	632568,4	756120,1	926519,2	974070,0
K_{on}	0,001	0,002	0,002	0,001	0,001	0,002

Source: calculated according to Statistics of Ukraine.

The coefficient of renewal of new products in the food industry in Ukraine indicates stable and insignificant data, which may be due to several factors: companies do not finance innovation, because they are actively selling well-known goods or do not have the funds to innovate. For Poland, the initial data for the calculation were not found, so this ratio could not be compared.

Thus, speaking separately about the food industry, it should be noted that on average in recent years the highest rate of development of new products – in the production of beverages, dairy products and ice cream and for the production of bread and bakery products; the smallest - in the production of ready-made animal feed, sugar, confectionery, grain processing, starch production. The food industry in both Ukraine and Poland has extremely favorable conditions for its effective development, and is one of the leading structural components of the national economy, and its functioning is a leading factor in economic and social growth, the main condition for improving living standards. In Ukraine, the food industries that are most developing in the innovative direction are confectionery and beverage production. Despite this, domestic enterprises need to introduce the latest technologies, actively implement innovations, which is possible through the implementation of research and development work; The involvement of highly professional staff, in turn, will help identify reserves to increase competitiveness in the world market and the opportunity to move from the country – producer of raw materials to the country – producer of final products. And in this situation, the experience of Poland is useful.

Due to the introduction of innovations, there can be invented internal reserves of the enterprise, namely:

- increase in volumes used in the production of resources (labor resources, fixed assets, materials);

- increasing the use-time for labor resources and fixed assets;
- elimination of the causes of unproductive use of all these types of resources.

In addition, the company can produce products with fewer resources involved, or with a constant number of resources involved to produce more products, as can be seen in table 2 and graph 2.

Due to the introduction of innovations, the location of reserves leads to the improvement of fixed assets, materials, staff improvement, increasing the level of technology, the degree of mechanization and automation of production processes, production organization, improving product quality, increasing technical and energy equipment and more. These types of internal reserves can take place in the activities of food industry enterprises. It is these reserves and ways to mobilize them, that are reflected in the long-term plans of organizational and technical measures.

For enterprises producing cocoa, chocolate and sugar confectionery, the formation of reserves, as a stock of resources, is an extremely important element of existence, because the presence of risky situations with the supply of raw materials can lead to loss of consumers and stop production. Considering stocks and reserves as separate concepts, we emphasize the latter as uncertain opportunities to identify promising ways for further development of enterprises. These can be: upgrades of special equipment for storage and transportation of goods; re-equipment of premises for new goods; rational use of available resources; improvement of loading and unloading works; equipment modification; reconstruction of warehouses; modernization of the general process of wholesale trade; introduction of upgrades, etc. All these improvements in the operation of wholesale trade are aimed at improving efficiency and competitiveness in the market. Our attention was drawn to the upgrade, as one of the areas of equipment improvement. Along with this definition, the concept of "human upgrade" has appeared and can be applied in work, but it needs more meticulous elaboration and will be covered in further research.

CONCLUSION

As a result of the conducted research the expediency of introduction of innovations at the enterprises of the food industry is proved. A comparative analysis of the selected coefficients for calculating the definition of innovation activity showed a close relationship between innovation and the identification of reserves, and the experience of Poland confirms this statement.

The proposed scientific hypothesis that innovations can help identify reserves to increase the competitiveness of enterprises needs further confirmation. But there are positive arguments that innovation has a significant impact on the identification of reserves. On the example of Poland, this is manifested in the reduction of the number of people working in production and the stable state of the average number of employees in research and development departments with a larger than in Ukraine, volume of sold innovative products of the food industry.

Both the chosen methods for research and the interpretation of the obtained results can be debatable. The main disadvantage of this work is the lack of primary information. In this case, it would be interesting to work together with Polish scientists and further develop the proposed hypothesis.

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