PECULIARITIES OF INNOVATIVE ACTIVITY OF FOOD PRODUCERS’ ENTERPRISES IN THE CONDITIONS OF A WORLD PANDEMIC

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Abstract
The research aims to study the current state, problems and justify directions of ensuring the innovative activity of food industry producers in Ukraine. It is based on the generalization of trends in the food industry analyse and substantiate the factors and components affecting the innovation activity of Ukrainian food producers. Also, this research identify priority areas and their influence levers to increase the innovative activity of food producers in a pandemic.

Data for the study have been taken from the Ukraine statistical sources of information, scientific and analytical sources and empirically, the features of the current state of innovative activity of food industry manufacturers in Ukraine have been established. The method of comparison is used in the analysis of certain indicators of innovative development of food industry enterprises. The problem of ensuring innovative development based on a systematic approach and synthesis of innovative development mechanisms has been investigated. Multiple regression has been applied in the construction of the model to determine the influence of factors on the food industry’s innovative activities.

As a result of the research, the factors that influence the innovative activity of Ukrainian food producers have been identified. The influence of factors has been determined by three main key groups, in particular, the macroeconomic, mesoeconomic and microeconomic nature of the impact. The influential components of food industry producers were analysed and substantiated: the number of enterprises engaged in the innovative activity (ENG); the number industrial enterprises introducing innovations (INT); the volume of innovative expenses of food producers (EXP); the number of employees employed in R&D of innovative activity at food industry (EMP).

The most influential component is the number of employees employed in R&D of innovative activities in the food industry (EMP), and the number of enterprises engaged in innovation activities (ENG) has the smallest influence. Based on these conclusions, proposals were developed on ways of providing the innovative activity of the food producers, in the aspect of corresponding interaction between government and regional level, in the context of harmonized resource utilization and integrative cooperation between all levels of participants engaged.

Key words: Innovative activity of enterprises, Food industry, Pandemic, Factors, Components of influence, Directions of providing.

1. Introduction
COVID-19, commonly known as coronavirus, is a major public health emergency for citizens, society and the economy. Having spread from China, the pandemic has already provoked infections in all countries. Coronavirus infection is also developing rapidly in Ukraine, dealing a significant blow to the domestic economy.

The outbreak of coronavirus is a severe economic shock for all countries in the world. The spread of the pandemic is causing disruptions in global supply chains, instability in financial markets, shocks in consumer demand and negative impacts in key sectors such as government industry, including food.

The food industry, represented by a set of food industry producers, is one of the most strategically important sectors of the economy. This remark is based on the following statements:
- The food industry belongs to the top five industries that are leaders in filling the state budget;
- It takes second place (after metallurgy and metal processing) depending on the volume of production in the structure of industrial production of our state;
- It is aimed at meeting domestic food needs and is able to fully meet such needs;
- The food industry occupies a significant share in the overall structure of Ukraine's exports and a positive foreign trade balance.

Food industry has a significant impact on the general state of the economy, provides food security, acts as a basis for domestic and foreign markets, directly shapes the living standards of the population. There is no doubt that the basis for sustainable development of food industry producers is their innovative activity, which usually means the degree of systematic development and implementation of innovations [1]. Ensuring the innovative activity of food producers in a pandemic is of paramount importance. This remark is based on the following:
- First, the effectiveness of the innovative way of the national economy development in general and individual industries in particular, today is beyond doubt. The introduction of innovations in today’s conditions is the only effective lever for the renewal of all industries without exception and ensuring the sustainability of their development.
- Second, the analysis of the ways of introducing innovations shows that the provision of innovation activity is the most effective and efficient way due to compliance with such key principles as systematization, comprehensiveness, and complexity. This is an important step towards competitiveness in a pandemic.
- Third, it is the food industry that is the most favorable in the context of innovation. This is due to the strategic importance of the food industry: the innovative activity of food producers not only contributes to the competitiveness of such enterprises, their position in foreign markets, but also achieves a social effect, which is to increase the level of food for the population.

However, in today's conditions, food producers suffer significant losses, face the impossibility of ensuring the sustainability of their activities and lose the opportunity to innovate and implement certain innovative projects in this area [2]. Under such conditions, the problem of studying the impact of the pandemic on the innovative activity of food producers and finding ways to solve this problem is important. This determined the relevance of this study.

The aim of the work is to study the current state, problems, and justification of the directions of ensuring the innovative activity of food industry producers in Ukraine. Based on the generalization of trends in the food industry to analyze and justify the factors that affect the innovation activity of Ukrainian food producers. Identify priority areas and influential levers to increase the innovative activity of food producers in a pandemic.

2. Materials and Methods

Data for the study have been taken from the Ukraine statistical sources of information, scientific and analytical sources and empirically, the features of the current state of innovative activity of food industry manufacturers in Ukraine have been established. The method of comparison is used in the analysis of certain indicators of innovative development of food industry enterprises. The problem of ensuring innovative development based on a systematic approach and synthesis of innovative development mechanisms has been investigated.

Multiple regression has been applied in the construction of the model to determine the influence of factors on the food industry's innovative activities.

3. Results and Discussion

3.1 Current state and problems of innovative activity of food industry producers in Ukraine

The development of the food industry in modern conditions is impossible without the development of conceptual solutions, ideas designed to increase its level of competitiveness. It is the gradual transition of the food industry to an innovative type of development, supplemented by appropriate tools, will not only expand its production, but also increase the activities of all structural units of enterprises engaged in manufacturing. The need to ensure the innovative activity of food industry enterprises is also confirmed by the specifics of products, namely the limited shelf life of such products, as well as consumer interest in product quality at all stages of production and sale. Given the purpose of this study, it is appropriate to form a resultant indicator (IA), which should undoubtedly include the dynamics of the number of innovatively active food producers, which is summarized in Figure 1.

As can be seen from Figure 1, the dynamics throughout this period is a wave. However, it was 2020 that
became critical, significantly reducing the number of innovatively active food producers.

Therefore, if we consider the innovation activity of the industry as a whole, it should be noted that the effective indicator of innovative development of this industry, i.e. the influential component is the number of innovatively active food producers (IA). After all, the food production system must be built in such a way that the number of innovative enterprises in the industry has a constant tendency to increase.

The volume of innovative enterprises is influenced by the number of enterprises engaged in innovation (ID) and the number of enterprises in the industry that have implemented innovations (VI).

The dynamics of the number of food producers in Ukraine engaged in innovation and innovation in 2005 - 2020 is presented in Figure 2.

As can be seen from Figure 2, by 2012 there is a clear trend to increase the innovative activity of food producers, during 2015 - 2017 there was a significant decline in the number of enterprises that implemented innovations, but this decline changed to an increasing trend in 2018 and 2019. At the same time, 2020 became critical and the number of innovatively active enterprises decreased sharply. The outlined trends show that the 2020 pandemic has had a significant negative impact on the innovative activity of food producers, jeopardizing the innovation potential of the entire industry.

In addition, in the context of this study, it is advisable to establish the impact of innovation costs (IC) on the resulting indicator. The volume of innovation costs of food producers in Ukraine in 2014 - 2020 is presented in Figure 3.

As can be seen from Figure 3, the volume of innovation costs of food producers in Ukraine has a wave trend and the established dynamics is almost absent. However, an important conclusion based on the analysis of the official statistics shown in the figure is the confirmation of the hypothesis of the devastating impact of the negative effects of the pandemic on the innovative activity of the food industry of Ukraine.

The main prerequisite for this trend is the financial inability of food industry producers to innovate. This is due to the fact that the transition to fundamentally new, innovative food production technologies requires significant costs for innovation, which has not been possible in a pandemic associated with an outbreak of coronavirus disease. In addition, given that the innovative activity of food producers is directly related to the staff engaged in innovation processes, it is advisable to determine the relationship between the innovative activity of enterprises and the number of employees engaged in research and development in innovation in the food industry (IP).

The dynamics of the outlined indicator is summarized in Figure 4.
The data shown in Figure 4 confirms the general trend that has already been outlined in the context of this study: in 2017, there was a certain decline in almost all development indicators. However, during 2018 and 2019, the situation changed, which was confirmed by the positive trend that emerged. At the same time, 2020 dealt a devastating blow to the general trend.

3.2 Research of factors influencing the innovative activity of Ukrainian food producers

Analysis of official statistics and identified trends confirmed the assertion of the negative impact of the global pandemic on the innovative activity of food producers. This necessitates the specification of the issue of key factors of influence for the further development of directions for ensuring the innovative activity of food producers in a pandemic.

At the same time, ensuring the innovative activity of food producers is accompanied by certain difficulties and obstacles, which have been exacerbated by the following macroeconomic reasons:
- The actual lack of an institutional basis for the implementation of innovative approaches (institutional, legal, financial);
- Maintaining a more centralized structure of public administration, which puts the economic mechanism and its development in complete dependence on the interests and aspirations of political elites;
- Aggravation of the confrontation of the ruling elites, which leads to the incapacity of higher authorities; and
- The growing current economic crisis, which sharply reduces the already scarce financial resources of the country [6, 7, 8, and 11].

The logical consequence of macroeconomic factors is the emergence of negative consequences at the meso and micro levels, namely: the absence or imperfection of the financial, methodological, methodological and personnel basis for innovation at the industry level (meso level) and at the level of individual food industry (micro level).

Problem of weak innovative activity of food enterprises is due to its priority in the formation of development strategy and its inseparable relationship with other pressing issues. These, of course, include: increasing disparities in socio-economic development, outdated production and social infrastructure, irrational use of human resources, and weak interregional ties.

New economic relations call for a change in the mechanism of ensuring the innovative activity of enterprises of particularly important industries. There is a need to develop not only national but also regional strategies to overcome the weak investment activity of food producers, due to the fact that there is an inseparable link between investment and its innovation potential.

A constraining component of commercial investment in the innovative activities of the food industry is the acute shortage of funds for current financing. On the other hand, the high cost of innovative programs and their slow self-sufficiency hinder investment policy [9].

Uncertainty about the domestic economic situation in the country and too expensive credits are also clearly not conducive to private investment. Reducing tax and other payments of banks in exchange for lowering their lending rates for these types of organizations would partially solve the problem, contributing to the innovative development of the regions with their further implementation.

The priority task for the transition of Ukraine’s economy to an innovative path of development should be the delimitation of the main items of expenditure on the creation, implementation and commercialization of innovations in the food industry.

In addition, there are certain shortcomings of the regulatory framework of Ukraine, which constrain the innovative activity of food industry producers, which include:
A. At the macro level:
- There are no clearly defined legal norms for the protection of trade secrets, know-how;
- The legal regime of protection and use of intellectual property created in connection with the implementation of the employment contract, created at the expense of the state budget is not defined;
- There are no measures enshrined in law aimed at preventing offenses in the field of intellectual property rights;
- There is no legal regulation of the valuation of intellectual property, their purchase and registration;
- There is a need to improve the technology transfer procedure and the institution of legal liability for intellectual property offenses [10].

B. At the meso level there is the:

C. At the micro level there is a lack of:
- Financial basis for innovation; and
- Competent staff involved in the process of innovation [10].

The activity of only a small part of innovation structures in the food industry meets the challenges to be solved by them, based on the world experience of organizing its various types. In Ukraine, not only is the number of innovation structures limited, but their structural incompleteness has also developed, as well as the functional uncertainty of their activity in normative documents. Elements of innovation infrastructure are developed differently [3].

As comprehensive analysis has shown, the existing system of interaction between the food industry and science is a starting point for identifying obstacles and opportunities, understanding the effectiveness of measures taken and analyzing changes over time. This comprehensive assessment, which should be considered more in the educational context than in the analytical one, is still missing.

The commercialization of research requires start-up capital and a range of skills that are expensive to acquire. Given the uncertain profitability and financial difficulties that these academic organizations face, they need government support.

Cooperation between science and industry is complicated by the lack of information about the opportunities and high costs faced by organizations in search of partnership.

Public sector participation can help coordinate private initiatives and encourage closer links between the food industry and research institutions [12]. Small projects with little need for resources, but potentially large demonstration effect, aimed at developing the interaction between industry and science, are especially relevant in Ukraine, given the existing financial constraints and management problems [13]. Innovative vouchers are a useful tool due to the relatively simple administration and their focus on the development of the food industry [14].

3.3 Substantiation of the set of components that determine the innovative activity of Ukrainian food producers

Different degrees of influence of the outlined components can be noted on the basis of regression analysis. Therefore, for further research, we will construct a regression equation that will reflect the content of the impact of individual indicators on the innovative activity of food producers.

However, before that we will pay attention to the value of the correlation coefficient between the data series.

\[
R_{xy} = \frac{\overline{r} \cdot \overline{y} - \overline{x} \cdot \overline{y} \cdot \sigma_x \cdot \sigma_y}{\sqrt{\overline{x} \cdot \overline{x} \cdot 
\overline{y} \cdot \overline{y} - \overline{x} \cdot \overline{x} \cdot \overline{y} \cdot \overline{y} - \overline{x} \cdot \overline{x} \cdot \overline{y} \cdot \overline{y} - \overline{x} \cdot \overline{x} \cdot \overline{y} \cdot \overline{y}}\}
\]

Where: \(R_{xy}\) is the correlation coefficient; \(\overline{x}, \overline{y}\) - average values of samples; \(\sigma_{x}, \sigma_{y}\) - standard deviations.

Thus, the correlation coefficient between data series is equal to 0.82. Therefore, it is determined that the impact of the above components is significant and positive.

Since multiple regression allows to build a model with a large number of components, determining the impact of each of them in particular, as well as the cumulative impact on the performance trait, to determine the impact of components on innovation activity of food producers, it is advisable to calculate such an econometric model.

As components in this model will be:
- Number of enterprises engaged in the innovative activity (ENG).
- Number industrial enterprises introducing innovations (INT).
- Volume of innovative expenses of food producers (EXP).
- Number of employees employed in R&D of innovative activity at food industry (EMP).

Outlined components accumulate in the macro-, meso- and micro-level, because they have a cumulative effect, namely, for example, the amount of innovation costs of food producers is formed at the micro-level, then accumulated at the meso-level, and then formed at the state level.

The development of the model begins with the definition of its specification, the essence of which is the choice of components, and the choice of the type of regression equation. Components must be quantitative indicators and not correlate with each other, be functionally independent. Selection of components was carried out based on theoretical and economic analysis, which is justified above.

The multi-component regression linear model of the dependence of the detected violations in the respective quarter on the components was calculated using the Statgraphics Centurion package and has the form:
\[ IA = 0.00063327 \text{ ENG} - 0.000328381 \text{ INT} - 
2.88742 \text{ EXP} + 7.11572 \text{ EMP} + 4.3374 \]

Since the coefficient of determination is high, it can be concluded that the calculated model of the dependence of innovative activity of food producers on the components is statistically qualitative and suitable for determining the dynamics.

For a more thorough coverage of issues, it is advisable to provide a possible forecast of such dynamics. It is expedient to use models of growth curves to model the trend of development of innovative activity of food producers. These are functions of time, and it is believed that the influence of other components is insignificant or indirectly taken into account through the component of time.

Forecasting the trend of development of innovative activity of food producers, based on models of growth curves is based on extrapolation, i.e. on the continuation of previously identified trends for subsequent periods.

In forecasting the trend of development of innovative activity of food producers using growth curves, it is appropriate to use the following functions:

\[ y = a + b_1 t; \quad y = a + b_2 t^2; \quad y = a + b_3 t^3; \quad y = a + b_4 t^4 + b_5 t^5 + \ldots + b_n t^n \]

For the most part, the calculation of model parameter estimates is performed using the least squares method in the form of regression models, in which the values of indicators are chosen as a dependent variable, and the term is chosen as an independent one.

The choice of the best equation to build a trend in the context of this study should be done by searching the main forms of the trend, calculating for each equation the adjusted coefficient of determination \( R^2 \) and choosing the trend equation with the maximum value of the adjusted coefficient of determination.

Statistical quality of the calculated models of growth curves for the forecast will be checked by the quality criteria of the developed regression models: Student's criterion (t), Fisher's criterion (F), and Darbin-Watson's criterion (DW). As a result, the generalized influence of reasonable components on the innovative activity of food producers in accordance with the regression equation.

The reliability of equation 1 is confirmed by the value of P value, which is less than 0.05, i.e. there is a statistically significant relationship between the performance indicator and the components of the impact with a confidence level of 95%; T-Statistic > 2 - shows the significance of the model parameters; the model by 70.83% describes the variability of the performance indicator; Darbin-Watson value \( \approx 2 \), so there is no autocorrelation, it does not distort the quality of the model.

In addition, in the context of this study, the problems of assessing the components that affect the innovative activity of food producers using other methods are important. This remark is based on the fact that without a balanced process of such evaluation and obtaining its results, it is impossible to talk about the effectiveness of existing mechanisms, and therefore it is not appropriate to develop areas for improvement.

It is advisable to use the method of mathematical modeling of Kendall to assess the components that affect the innovative activity of food producers. Kendall's correlation coefficient (Kendall tau rank correlation coefficient) is a measure of the linear relationship between random variables. Kendall's correlation is rank, i.e. to assess the strength of the connection is not used numerical values, and their corresponding ranks.

The coefficient is invariant with respect to any monotonic transformation of the measurement scale. To do this, first of all it is necessary to distribute the components of the impact on the innovative activity of food producers (Table 1).

### Table 1. The set of components influencing the innovative activity of food producers

<table>
<thead>
<tr>
<th>N°</th>
<th>Component of influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of enterprises engaged in the innovative activity</td>
</tr>
<tr>
<td>2</td>
<td>Number of enterprises introducing innovations</td>
</tr>
<tr>
<td>3</td>
<td>Volume of innovative expenses of food producers</td>
</tr>
<tr>
<td>4</td>
<td>Number of employees employed in R&amp;D of innovative activity</td>
</tr>
</tbody>
</table>

To determine the adequacy of the level of agreement of experts' opinions, the Kendall concordance coefficient was used (Table 2).

### Table 2. Rank matrix

<table>
<thead>
<tr>
<th>Components</th>
<th>Experts</th>
<th>Sum of ranks</th>
<th>D</th>
<th>d2</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>x2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>x3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>x4</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>23</td>
</tr>
</tbody>
</table>
Kendall’s concordance coefficient (W) is an indicator of multiple rank correlation. W can take values in the range from 0 to +1, where W = 0 means a complete lack of consistency in the assessments or judgments of experts, and W = 1 - complete consistency. Representatives of food industry enterprises of Ukraine acted as experts. The purpose of this study does not require specifying the positions and names of such experts. We propose to take W = 0.5 as the maximum allowable value of the concordance coefficient (average agreement of experts).

$$d = \sum x_i - \left( \frac{\sum x_i}{n} \right) = \sum x_i - 27.5 \quad (4)$$

In this example, the components by importance were distributed as follows (Table 3).

<table>
<thead>
<tr>
<th>Components</th>
<th>Sum of ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>x4 Number of employees employed in R&amp;D of innovative activity at food industry (EMP)</td>
<td>23</td>
</tr>
<tr>
<td>x3 Volume of innovative expenses of food producers (EXP)</td>
<td>19</td>
</tr>
<tr>
<td>x2 Number industrial enterprises introducing innovations (INT)</td>
<td>15</td>
</tr>
<tr>
<td>x1 Number of enterprises engaged in the innovative activity (ENG)</td>
<td>11</td>
</tr>
</tbody>
</table>

The sum of the ranks is the sum of the number of points set by the experts in the aggregate in terms of each individual component.

According to the results presented in Table 3, we can conclude that the most influential component is the number of employees employed in R&D of innovative activity at food industry (EMP) - the sum of ranks 23, and the least influential - the number of enterprises engaged in the innovative activity (ENG) - the sum of ranks 11. Such results are quite logical due to the fact that enterprises engaged in innovation do not fully reflect the state of innovation potential due to the lack of a specific result of such activities (to engage in this does not mean to implement). At the same time, the number of employees engaged in innovation is directly related to the state and turnover of innovation.

To assess the average degree of consistency of opinion of all experts using the concordance coefficient, we use the Pearson agreement criterion:

$$x^2 = \frac{12S}{mn(n+1)} \quad (6)$$

x1 is compared with the tabular value for the number of degrees of freedom K = n - 1 = 10 - 1 = 9 and at a given level of significance α = 0.05. Since the calculated x1 (16.14) is less than the tabular (16.9), the value W = 0.583 is not random, and therefore the results are meaningful and can be used in further studies.

Thus, in the context of this study, the components of the impact on the innovative activity of food producers are substantiated and with the help of the method of correlation analysis of Kendall - separate components are located by significance. This allowed to identify the most influential components on the innovative activity of enterprises, which provides an opportunity to adjust the impact of such components in order to increase the innovative activity of domestic food business entities.

3.4 Directions for ensuring the innovative activity of food producers

In this context, it is advisable to make a few important remarks, which ultimately form the vector of development of directions for ensuring the innovative activity of food producers.

First, the development of directions for ensuring the innovative activity of food producers in a pandemic should not be limited to counteracting the effects of the pandemic. It is appropriate to summarize all the obstacles to the innovative activity of the food industry: significantly new obstacles that have emerged only as a result of the pandemic; traditionally existing obstacles to innovation activity; barriers that existed but were fragmented but exacerbated in a global pandemic. The generalization of the whole set of obstacles will allow to form complex directions of ensuring the innovative activity of food producers. Such areas of ensuring the innovative activity of food producers include: ensuring the protection of intellectual property rights, improving the legal framework for the development of venture entrepreneurship, control over the distribution of subsidies, subventions and benefits, determining the effectiveness of their use directly on the ground.

Second, the outlined directions should be divided into levels: state, regional and micro. This remark is based on the fact that, according to the authors, it is the coordinated influence of the state and the region on the innovative activity of food industry producers will make it possible to achieve the maximum positive effect at the micro level.
Third, the components studied above have a significant impact on the innovative activity of food industry producers, so the areas to be developed must take into account the effect of all the above components of the impact.

Thus, the innovative activity of food producers involves a radical renewal of material and technical base, qualitatively new inventions, serious financial injections into research and development work at the level of an individual enterprise.

Areas of ensuring the innovative activity of food producers - can be divided into three areas of influence - 1 - at the enterprise level, 2 - at the regional level, 3 - at the state level.

To solve most of the outlined problems and overcome the above obstacles, it is necessary to form certain principles of cooperation between the state and regional levels to ensure the innovative activity of food producers.

At the same time, it is more appropriate to present the outlined interaction in the form of a table of correspondence, in which a certain action of the regional government will correspond to certain measures by the state authorities, which ultimately affects the innovative activity of food producers. This table is presented in Table 4.

Table 4. Correspondence of interaction of the state and regional level concerning maintenance of innovative activity of producers of foodstuff (microlevel) in the conditions of a pandemic [3, 4, 7, and 8]

<table>
<thead>
<tr>
<th>State level (forming)</th>
<th>Regional level (forming)</th>
<th>Micro level (resulting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State support of food producers through subsidies, subventions and benefits. This is necessary because the food industry is a strategically important industry that has a direct impact on the well-being of the Ukrainian people. At the same time, such actions will free up funds for food industry producers and they will be able to direct them to innovative activities.</td>
<td>Control over the distribution of subsidies, subventions and benefits, determining the effectiveness of their use directly on the ground by food producers</td>
<td>An effective and transparent mechanism for obtaining subsidies, subventions and benefits at the level of each individual enterprise</td>
</tr>
<tr>
<td>Ensuring the protection of intellectual property rights</td>
<td>Regional coordination of interaction of separate food producers within creation of innovative networks</td>
<td>An effective system of intellectual property protection at each individual enterprise of the food industry</td>
</tr>
<tr>
<td>Implementation of the program-target principle of state support of subjects of innovative activity among food producers</td>
<td>Participation in defining goals and objectives, participation in monitoring and evaluation of the system</td>
<td>Formation of an effective system of innovative development of the enterprise</td>
</tr>
<tr>
<td>Development of conditions for the creation of public-private partnership in innovation directly in the food industry</td>
<td>Creating business incubators</td>
<td>Existence of prospects of integration of the enterprise within the existing business incubators</td>
</tr>
<tr>
<td>Development of international scientific and technical exchange programs</td>
<td>Promoting the development of an innovative economy in the food industry through technology transfer</td>
<td>Availability of prospects for the company’s participation in the process of international scientific and technical exchange</td>
</tr>
<tr>
<td>Creating a system of constant scientific and technological forecasting, dissemination of its results among food producers</td>
<td>Participation in the development and implementation of programs for innovative development of food producers in the framework of innovation policy</td>
<td>Formation of an effective system of innovative development of the enterprise through participation in state and regional programs of innovative development</td>
</tr>
<tr>
<td>Improving the legal framework for the development of venture entrepreneurship</td>
<td>Promoting technological cooperation between enterprises and international cooperation through integration into European networks</td>
<td>Existence of prospects for cooperation with European manufacturers within the framework of joint innovation programs</td>
</tr>
<tr>
<td>Formation of new innovative segments</td>
<td>Providing systemic and comprehensive support for the operation of the system, including financial support for activities in accordance with the regional strategy and programs</td>
<td>Expansion of directions of innovative activity of each separate enterprise</td>
</tr>
<tr>
<td>Formation of a holistic system of organizational and legal, economic and other norms of stimulation, support and regulation of innovative activity of food producers</td>
<td>Organization of seminars, exhibitions, conferences and other events on information dissemination, training and exchange of experience</td>
<td>Expansion of channels in the interaction of the enterprise with potential partners within the implementation of innovation policy</td>
</tr>
</tbody>
</table>
From the experience of other countries, the primary tasks of stimulating innovation processes in the regions, experts include: establishing mechanisms for subsidizing (reimbursing) from the state budget interest rates on loans to innovative companies and providing tax benefits for innovation at the regional level [4]. It should be noted that the micro-level given in the table is the resultant, namely it is a consequence of the influence of factors of the state (macro) and regional (meso) levels.

Thus, to ensure the innovative activity of food producers in a pandemic, it is necessary at the legislative level to establish a state strategy for the development of this industry, to coordinate the development of specific enterprises with priority areas of innovation, to take measures to create innovative infrastructure in the industry.

4. Conclusions

- According to the results of quantitative analysis, the innovative activity of food producers is influenced by certain components: the number of enterprises engaged in innovation (ENG); the number of enterprises in the industry that have introduced innovations (INT); the volume of innovation expenses of food producers (EXP); the number of employees employed in innovation activities in the food industry (EMP). Substantiation of the above components of the impact showed that the most influential component is the number of employees employed in innovation activities in the food industry (EMP) - the sum of ranks 23, and the least influential - the number of enterprises engaged in innovation (ENG) - the sum of ranks 11.
- This allowed to establish the most influential components, factors on the innovative activity of enterprises, which provides an opportunity to adjust their impact to increase the innovative activity of domestic food businesses. Therefore, to increase the innovative activity of food producers it is necessary to radically update the material and technical base, qualitatively new inventions, serious financial injections into research and development work at the level of an individual enterprise. An important issue in today's conditions is the formation at the state level of a holistic and effective system of transforming knowledge into new equipment, products, goods and services, combining regional and national interests and, most importantly, increasing people's well-being by ensuring innovative activity of food producers. An important basis for this is the justification of areas of innovation of food producers, which allow to coordinate the necessary actions of regional authorities in accordance with government measures, as well as at the enterprise level (micro level) as a result of the first two levels, and will promote growth of innovative activity of the enterprises.
- As a direction of further research, it is advisable to indicate the need to develop a procedure for assessing the innovative potential of each individual representative of the food industry.

5. References