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INNOVATIVE ACTIVITY AND ECONOMIC EFFICIENCY OF THE FOOD INDUSTRY ENTERPRISES OF UKRAINE

KRYSANOV Dmytro,
Doctor of Economics, Professor,
Bila Tserkva National Agrarian University,
Bila Tserkva, Ukraine,
E-mail: d_krysanov@ukr.net
https://orcid.org/0000-0002-9065-3325

TKACHENKO Kateryna,
Candidate of economic sciences, Assistant,
Bila Tserkva National Agrarian University,
Bila Tserkva, Ukraine,
E-mail: K-Tkachenko@ukr.net
https://orcid.org/0000-0002-0369-3100

VARCHENKO Olha,
Doctor PhD, assistant Department of Finance, Banking and Insurance,
Bila Tserkva National Agrarian University,
Bila Tserkva, Ukraine,
E-mail: 1207olia@gmail.com
https://orcid.org/ 0000-0002-3543-6926;

SUMMARY

The development and implementation of innovations in the food industry and the production of modern food products at the current stage is a key factor in progress in the field of quality of life, one of the components of which is the balanced and caloric nutrition of the population. It has been established that, in this regard, Ukraine is significantly behind the EU countries in terms of the main parameters: production and sale of products new to the market, costs for innovation, the share of innovatively active enterprises, etc. Therefore, according to ratings agencies, it is in the group of "slow innovators" or outsiders. In order to radically change the situation, research has established that it is necessary to significantly increase funding in the innovation field, expand scientific research, development of innovative products and modern technologies, production of the latest equipment and a network of innovatively active enterprises with the aim of increasing the production of innovative products.

The production activity of food industry enterprises is measured by natural and economic indicators, and therefore it is appropriate to analyze it in the time period from 2015, that is, when the agrarian crisis was in full swing, and in the following years, its consequences were overcome and noticeable progress in development took place. It was established that the production of food products doubled in value, and the profitability of production was clearly divided into two periods: the first two years were unprofitable, and the profitability was relatively low, but the following were characterized by profitability and increased profitability. A noticeable decrease in profitability was observed at the end of the studied period and this is explained by the crisis that was provoked under the influence of the coronavirus epidemic.

Key words: breakthrough technologies, innovations, profitability, profit, loss.

Introduction. In modern conditions, the key components of the progressive development of the food industry are innovativeness and efficiency of food processing production. But its development is not of a stable upward nature - on this path, the food industry is significantly affected by agrarian crises, periodic declines in the production of agricultural products, worldwide epidemics, technological backwardness of production, low level of innovativeness of enterprises, etc. Taking into account the tendency of increasing external turbulence, the development of the food industry is almost constantly subjected to powerful tests, and all this affects the final indicators of efficiency and innovation and its integration into the EU internal market.

The methodological basis of the study. Statistical materials of the State Statistics Service of Ukraine were used to conduct the research, in particular statistical data on the development of innovative products and the introduction of advanced technologies, the dynamics of innovatively active enterprises and the sale of industrial and innovative products, the share of innovation costs, etc. The declining innovation trend in the food sector, the destruction of processing facilities in the occupied territories led to a reduction in the scale and curtailment of production and innovation activities in the food industry.

The results. The modern development of the food industry is strongly influenced by internal distortions and asymmetries, as well as external turbulence. The development and implementation of innovations in the food industry is the most important way of realizing the achievements of science and technology in the field of production of resources necessary for the survival and development of human society. The transition from traditional post-Soviet technologies of processing food raw materials to modern deep processing and production of innovative food and nano-products is a key problem. However, innovative activity in the food industry has a tendency to narrow and decrease in all main indicators and directions. Therefore, the purpose of the article was to analyze the trends in innovative activity, reveal and evaluate the current situation and substantiate the directions, mechanisms and methods of its activation in the conditions of the post-war revival of the food industry.

The dynamics of providing the necessary material resources (technologies, innovative products, equipment, etc.) and the effectiveness of innovative activities in the second half of the 2010s are shown in the table. 1.

Table 1.Dynamics of innovative provision and implementation innovative products by enterprises of the food industry of Ukraine*

Indexes	2015	2016	2017	2018	2019**	2020	2020:2015
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
A total of active business entities (BE), *one*	16157	15272	15119	15544	16275	16222	100,4
- of them PE, *units*	10655	10168	9621	9829	10295	10199	95,7
- СГ (without ФОП), *units* - BE (without PE), units	5502	5104	5498	5715	5980	6023	109,4
1. Enterprises that introduced innovations, *units*							
Total industrial enterprises***	984	901	938	967	1009	988	100,4
All innovatively active. Enterprises	186	170	167	191	158	191	102,7
% of industrial enterprises	18,9	18,9	17,8	19,7	15,6	18,9	100,0
Introduced innovations (products and/or technological processes), of which:	165	154	158	177	*143*	176	106,7
a) innovative processes	80	110	98	95	*n/d*	*n/d*	118,6
- of them are low-waste, resource-saving	23	41	42	43	*n/d*	*n/d*	187,0
b) innovative types of products	93	115	89	154	*82*	143	153,9
- of them new for the market	18	32	19	46	*22*	30	166,7
2. Enterprises that implemented innovative products, *units*							
Total	143	144	117	169	*115*	142	99,3
% from innovatively active enterprises	76,9	84,7	70,1	88,5	*72,8*	74,3	-2,6
including:							
- new for the market	23	36	25	46	*30*	30	130,4
- new for the enterprise	135	116	102	144	*97*	130	96,3
3. New technological processes and units were implemented							
Total	116	275	275	204	*159*	*n/d*	175,9
including low-waste, resource-saving ones	41	96	96	89	*59*	*n/d*	in 2,2 р.б.
4. Innovative types of products and names have been introduced							
In total, of them:	455	885	563	893	*591*	*1079*	196,2
a) new for the market	68	191	80	229	*86*	*157*	3.3 times more
b) machines, equipment, devices, devices	26	37	54	58	*73*	*50*	2,2 times more
- some of them are new for the market	10	17	к/с	14	*к/с*	*7*	140,0
5. Acquisition of new technologies, *units*							
In total, of them:	91	n/d	99	*n/d*	*60*	*n/d*	108,8
a) in Ukraine	85	n/d	88	*n/d*	*54*	*n/d*	103,5
b) outside of Ukraine	6	n/d	11	*n/d*	*6*	*n/d*	183,3
6. Implemented innovative products							
Volume of sold industrial products, million UAH.	398023	462419	548378	589855	616167	571773	143,6

Volume of implemented innovative products, UAH million.	4874,5	n/d	4711,9	6292,4	*5780,0*	*6664,1*	129,1
% of industrial production	1,3	n/d	0,9	1,0	*1,2*	*1,2*	-0,3
including:		n/d					
- new for the market, million UAH.	877,6	n/d	436,3	2253,1	*847,9*	*965,5*	2,5 times more
% from innovative products	18,0	n/d	9,3	35,8	*14,7*	*14,5*	+17,8
- new for the enterprise, million UAH.	3996,9	n/d	4275,6	4039,3	*4932,1*	*5698,6*	101,0
% from innovative products	82,0	n/d	90,7	64,2	*85,3*	*85,5*	-17,8
For reference: Capital investments, fixed assets and depreciation of fixed assets of the food industry							
Capital investments, *million UAH.*	14404,7	18900,5	19324,6	30747,0	30822,8	29022,6	2,0 times more
Fixed assets, *million UAH*	136202	163996	182445	207157	260718	316635	2,3 times more
Depreciation of fixed assets, %	47,5	51,1	50,6	48,3	42,1	49,1	+1,6

*Source: compiled and calculated according to the collections "Scientific and innovative activity of Ukraine" for the corresponding years. The statistical data for 2020-2021 were formed according to the European methodology and they do not correlate with the given data for 2015-2019 and partially coincide with the data for 2020.

**Excluding the production of tobacco products by almost all indicators for 2019, with the exception of: 6 tobacco industry enterprises are taken into account, of which only 1 is innovatively active (for 2020 – 8 and 1, respectively). For 2020, some indicators also do not include data on the tobacco industry (in italics). Recent years (highlighted in italics) were not taken into account when calculating all indicators due to the incompleteness of statistical data.

n/d - no data.

The algorithm for the inclusion of food industry enterprises in innovative activities is considered in the following sequence (Table 1): active business entities (the total number for the second half of the 2010s within 16.3-15.1 thousand units) - active economic entities - without PE (6.0-5.1 thousand units) - industrial enterprises (practically all large and medium-sized - 1009-901 units) - innovatively active enterprises (191-158 units) - enterprises, that introduced innovations (177-154 units) - enterprises that sold innovative products (169-117 units). The declining nature of the number of enterprises, such as approaching the group of manufacturers that produce and sell innovative products, although it always persists, but it precisely demonstrates the general tendency of narrowing the scope and limiting the results of innovative activities. In particular, despite the fact that innovative types of products were introduced 3.3 times more, and new ones for the market - 1.4 times more, compared to 2015, the implementation of innovative products increased only 1.3 times more, while industrial products - 1.4 more. That is, there is a clear downward trend in the effectiveness of innovative activity, despite the fact that not only the number of innovative products, technologies and equipment entering production, but also the release of new innovative products for the market increased by 2.5 times. The share of innovative products sold also decreased from 1.3% to 1.0%. In general, this is the result of the influence of factors of both a national and specific industry nature.

As for the first parameter, that is, the characteristics of an individual country compared to other states of the world, its ability to master advanced or breakthrough technologies and implement related technological and non-technological innovations is assessed. The innovative potential and innovative capacity of Ukraine is assessed by the following four international ratings for 2014-2020.

- The Global Innovation Index - DIII - decreased from 63 to 45 Index values (45th place among 131 world economies);

- Bloomberg Innovation Index - BII- rose from 49 to 56 values of the Index (56th place among 60 countries);

- Global Talent Competitiveness Index- GTCI - decreased from 71 to 66 Index values (66th place among 132 countries);

- European Innovation Scoreboard - EIS - rose from 34 to 36 Index values (36% - below 50% of the EU average, i.e. Ukraine is in the group of countries "slow innovators"-outsiders).

The dynamics of Ukraine's ratings according to four approaches to the assessment of innovation capacity for 2014-2020 allow us to conclude that there is no active policy and breakthroughs in the support of innovative activities by both the state and business. The basis of Ukrainian innovative competitiveness is human capital, higher education, as well as knowledge and results of scientific research. However, weak state institutions, an unfavorable environment for conducting innovative business, and an unfriendly financial system hinder the disclosure of entrepreneurial potential, create obstacles to the commercialization of innovations and their impact on GDP growth. In the last decade, Ukraine remains in the group of countries with a lower than average income (grouping of countries by the World Bank) [1, p. 4-5].

Ukraine's ability to master advanced technologies is assessed by the A Frontier Technologies Readiness Index, introduced by UNCTAD in 2021. According to the rating for 2020, Ukraine with an index of 0.56 ranks 53rd among 158 countries in the world - the level of readiness for advanced technologies is higher than average. It has a fairly high rating for such components

of this Index as the level of education (skills) of the population and research activity (number of patents and publications), the share of high technologies in industrial production, but a low rating for the level of ICT infrastructure (information and communication technologies) and accessibility private enterprises to loans [1, p. 10-11].

The place of Ukraine among the countries of the world, the strong and weak components of its readiness for the introduction of breakthrough technologies allow us to assess the reasons for the decline in innovative activity in the food industry. The Innovation Sphere Development Strategy [2] emphasizes that "the current state of innovative activity is a consequence of the lack of a strategic vision and a consistent state policy of transferring Ukraine to an innovative path of development, forming a national innovation ecosystem (a set of institutions, relationships, as well as various types of resources involved in the process of creating and applying scientific knowledge and technologies that ensure the development of innovative activity), which would ensure its implementation and increase the development of innovative culture in the state, using, in addition to financial, other mechanisms for the development of innovative activity. Despite the presence of individual elements, there is no integrated national innovation system, the purpose of which is the creation of innovative products (processes) and their quick introduction to the market (implementation).

The given description of the situation in Ukraine in general is the starting point for analyzing the causes of the critical state with innovative activity in the food industry. As a result, a number of systemic deficiencies and problems were identified that inhibited the development of innovative activities in the food industry sector in the second half of the 2010s.

Under the current conditions, the competitive advantages of enterprises are formed through the development and implementation of innovations: new products, breakthrough technologies, the involvement of modern knowledge and information in production. In the food industry, since 2015, 15.6-19.7% of enterprises (large and medium-sized) engaged in innovative activities, and even less - 14.2-18.7% - sold innovative products. Therefore, the innovativeness of enterprises in the food sector was significantly lower than in the EU countries: the minimum indicators were at the level of 26-29%, in the leading countries - 64-72%, and on average the share of innovatively active enterprises was about 53% [3, p. 21-22]. The share of innovative products in Ukraine was only 0.9-1.3%, in EU countries - 25-35%, but if it is less than 20%, then national products lose their competitiveness.

Part of the problems is explained by the insufficient financing of innovative activities in the food sector. The financing of innovative activities does not have a fixed trend, but is characterized by variable dynamics (a noticeable increase in costs alternates with a noticeable decline, which is further intensified, but is sharply changed by a strong increase in the amount of financial support), and this is a direct result of the inconsistent attitude of the management of enterprises to the product and technological component production of food products The main sources of financing: own funds and loans - more than 98%, the share of state and local budgets is very small, the participation of resident investors and non-resident investors has not been made public in recent years, and in 2016 - respectively 0.1% and 0.3%.

Innovative activity in the food industry of Ukraine lags far behind similar activity in the EU and the world. In particular, the costs of innovative activities in the total value of sold products for the last decade in Ukraine amounted to 0.32-0.62%, but in the EU countries - 2.3%, in other countries of the world - 3.2-6.7%; the share of expenses for internal and external research and development from the total volume of expenses for innovative activity - 0.56% and 8.3-63.2%. Enterprises of the leading European countries are much more focused on increasing the level of novelty of innovations, investing significant financial resources in scientific and technical developments: the share of expenditures on scientific and research developments in Sweden is 63.2%, the Netherlands - 62.5%, Luxembourg - 53.8 %, Belgium – 42%, Turkey – 28.9%, Poland – 8.3%, Romania – 13.4%, the Czech Republic – 23.2%, Russia – 15% of the total amount of innovation costs [4].

The share of costs for the performance of scientific and scientific and technical works from industry in 2019 was 0.43%, and the share of realized innovative products from the volume of realized industrial products was 1.3% [5]. Such disproportions in the volume of product production and innovation costs lead to a deterioration in the characteristics of the involvement of innovation costs: the share of innovation costs in the total cost of sold products for the last decade fluctuates at the level of 1% (the highest level was 1.57% in 2007, the lowest was 0.32 % in 2010 and 0.39% in 2015 (actually in 2020 – 0.616%), which is significantly behind the indicators of developed countries: Germany – 3.2%, South Korea – 4.5%, Canada – 5, 8%, Sweden - 6.7%, Estonia - 3.6%, Denmark - 3.2%, the EU - 2.3%. Representatives of the National Academy of Sciences of Ukraine claim that "with such amounts of funding for innovative activities, it is practically impossible for expanded innovative - technological reproduction of industrial production and restructuring of the economy based on the implementation of scientific and technical achievements" [3, 22].

The unprovoked Russian-Ukrainian war made very sensitive adjustments to the development of the national economy. In particular, the food industry showed a pessimistic trend in May-June 2022, but since July it has already started to restore optimism. As of September, 9% of food enterprises assessed their financial and economic situation as bad, while 16% - positive, and 75% - satisfactory. Since July, there has been a positive trend in the recovery of production: in September, 38% of surveyed enterprises increased production volumes, and only 12% - decreased them. In September, a total of 62% of food enterprises worked at almost full (75-99%) or full and higher capacity compared to the pre-war period. And only less than 5% of respondents did not work at all or worked at less than 25% capacity. As of September 2022,

every second company in the industry (53%) did not stop exporting, and only 15% of exporters were unable to resume it [6].

The main goal of the economic mechanism for the activation of innovative activity of food industry enterprises is to increase the level of their innovative activity by solving a number of modern problems based on the inclusion of participants in this process at all stages: conducting scientific research, developing modern innovations based on research results, their replication, commercialization of developments, implementation in production, release of innovative products and their implementation. Behind each stage there are various enterprises and specific business entities that see their economic interest in solving their own pressing problems and achieving the set goals for profit. By and large, the process of intensification of innovative activity in relation to the final link, that is, enterprises that produce and sell innovative products, can be considered as a chain that includes several actors of various scientific and research directions, including foreign ones, mainly focused on the production of modern technologies, equipment and products development This complicates the process of creating and promoting innovations in production, as it requires coordination of the economic interests of all participants without exception. Without this, the economic mechanism of activation of innovative activity will not be able to work.

But in international corporations and national companies, innovations can be developed in-house and introduced into production on the basis of intra-company economic relations and mutual calculations. This greatly facilitates the path from development to the introduction of innovations into production, both in terms of time and the cost of material, labor and financial resources at each stage. But the longer the chain and the more actors, the more difficult it is to coordinate economic interests.

The lifespan of an innovation, according to current regulations, is three years. Since 2015, the number of innovations has been between 455 and over 1,079 units, and the realization of innovative products is 0.9-1.3% of the industrial, that is, of the products sold by enterprises of the food sector of the economy.

Therefore, in order to get closer to European parameters, it is necessary to increase the scale of scientific research, the development of innovative products, modern technologies, the production of the latest equipment and equipment, and significantly expand the network of innovatively active enterprises in order to increase the output by at least an order of magnitude innovative products. Special attention should be paid to the development of innovative infrastructure, which is used to spread and implement innovative developments in the network of enterprises in the food sector of the agro-industrial complex. A comprehensive solution to these important tasks is possible only after the end of the war and an assessment of the real situation with the state of the scientific research base, its ability to produce new ideas and modern technological and product developments, and the production potential of food industry enterprises and its ability to implement innovative developments.

Studies conducted by domestic scientists [1, p.5] showed that the strengths of Ukraine remain: knowledge and technological results, innovative connections, human capital and research, opportunities to attract talents, market and regulatory opportunities in the labor market, institutions, creativity, penetration of high technologies, skills. Human resources is a component of indices that still remains Ukraine's strongest point. The slow development of an innovative economic system attractive to researchers and engineers, along with the decrease in budgetary funding for education and science, can destroy this advantage of our country. Therefore, the scientific, methodical, financial and practical approaches to the organization and concentration of all efforts on breakthrough areas of progress in the creation, implementation and implementation of innovations in the field of modern food production should be radically revised.

The downward trend of innovative activity and the destruction of the potential of the food industry in the territories not under the control of Ukraine led to a reduction in the scope and curtailment of the directions of innovative activity in the food industry.

In the post-war period, in order to activate innovative activity, it is necessary to significantly increase the funding of priority scientific research and the development of process and product innovations of a new generation, which are capable of bringing the domestic food industry to a higher level. State investments should be more directed to fundamental scientific research, which will serve as a basic basis for the development of innovations of an applied nature. An important place here should be occupied by international food corporations, which include subsidiaries in Ukraine, and national associations (agroholdings), which conduct scientific research and innovative developments for the needs of their own production. The experience of organizing a territorial network and the functioning of domestic and foreign innovation and implementation structures, in particular: innovation clusters, business incubators, accelerators, technology transfer centers, technology platforms, etc., deserves attention and dissemination.

The production of food products and its economic efficiency is an important effective aspect of the functioning of food industry enterprises and the dependence on the degree of its innovativeness. At the same time, in this regard, the indicator of sold products, i.e., shipped to consumers, is more common and accessible for perception, since often part of the released products can be in warehouses, and in crisis conditions - even lead to overstocking of the retail network. From a financial point of view, the 2014-2015 crisis and even partially 2016 were the most difficult, but the food industry successfully coped with negative phenomena. Therefore, for further analysis, it is advisable to take 2015 as a starting point, when the production index was at a rather low level and amounted to only 89.1%, compared to the previous year 2014, and 95.2% in relation to the base year 1990. Implemented this year, production is accepted at 100% and, accordingly, all industries (groups) are in the same starting position (Table 2).

Table 2. The volume of sold products by branches of the food industry of Ukraine, *million UAH*

Branches (sections and groups)	2015	2016	2017	2018	2019	2020	2021	2021: 2015= %
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
TOTAL (10+11+12); from it:	**427193**	**526861**	**636536**	**673823**	**698109**	**777719**	**948382**	**222,0**
10 Production of food products	**333299**	**421840**	**508752**	**539932**	**563306**	**618125**	**758015**	**227,4**
10.1 production of meat and meat products	42827	42645	83640	87108	85686	92899	116128	271,1
10.2 processing and conservation of fish, crustaceans and molluscs	4121	5973	7271	9014	10693	12783	15126	367,0
10.3 processing and preservation of fruits and vegetables	17061	18275	21874	25392	26910	17808	21985	128,8
10.4 production of oil and animal fats	106902	181268	192618	201430	203534	245342	308856	288,9
10.5 production of dairy products	40883	45805	61119	67731	71174	75531	79990	195,6
10.6 production of products of flour milling and semolina industry, starch and starch products	18350	24790	26544	23450	31631	31743	46890	255,5
10.7 production of bread, bakery and flour products	26353	26190	26620	30115	34065	36438	48714	184,8
10.8 production of other food products	57255	61334	75283	81182	81145	84757	98351	171,8
10.9 production of finished feed for animals	19547	15560	11782	14511	18466	20824	21976	112,4
11 Production of beverages	**51376**	**57164**	**63303**	**73157**	**72472**	**88053**	**96622**	**188,1**
12 Production of tobacco products	**42518**	**47857**	**64481**	**60734**	**62331**	**71541**	**93745**	**220,5**
For reference: food industry production index and food raw material price index, %								
- to the base year 1990	**95,2**	**101,3**	**108,6**	**107,0**	**107,2**	**105,0**	**99,3**	**4,1**
- to the previous year	89,1	107,4	106,3	98,7	103,3	99,2	94,6	5,5
Price index for agricultural products	166,0	107,6	111,8	104,4	86,6	153,6	116,7	in 3,23 times

Compiled and calculated according to: Volume of sold products (goods, services) of enterprises by types of economic activity. URL: https://ukrstat.gov.ua/operativ/menu/menu_u/sze_20.htm.

Listed in the table. 2 statistical data show that, according to NACE -2010, the leading position is occupied by the group of enterprises 10.4 production of oil and animal fats. During the researched period, the group's production increased almost threefold, and its share in the structure of the food industry's sold products increased from a quarter to almost a third (up to 32.6%) - up to UAH 309 million. Such a breakthrough was provided by the expansion of the area of oilseed crops, the increase in productivity and the increase in the gross collection of seeds, including in the individual sector.

Noticeable changes also occurred in the group of enterprises 10.1 production of meat and meat products - in terms of value, the output of sold products increased 2.7 times, and its share increased from 9.6% to 12.2% - to 116 million UAH. But if we take into account that in the studied period the price index for agricultural products grew by 3.23 times, it can be assumed with

certain tolerances that there is a decrease in the production of meat and meat products. In this regard, the leading position is occupied only by the group of enterprises 10.2 processing and canning of fish, crustaceans and mollusks, where production increased by 3.7 times, but due to the fact that this group occupies a small share (increased from 1.0% to 1.6%), it practically did not affect the general indicators. An even more declining result in the group of enterprises 10.9 production of ready-made fodder for animals - their share decreased almost by half - from 4.5% to 2.3%. The result is almost similar in the group of enterprises 10.3 processing and canning of fruits and vegetables - their share decreased almost by half - from 4.0% to 2.3%.

The decline in production was also observed in other groups of enterprises, which now hold a share of production within more or less 10% (total 30.4%), in particular: 10.8 production of other food products, 11.0 production of beverages, 12.0 production of tobacco products. At the beginning of the studied period, these groups of enterprises together held 35% of the value of the food industry's sold products. Therefore, to a certain or significant extent, there is a relative reduction in the production of such types of products as sugar and sugar confectionery, perishable and specific food products, grape and fruit and berry wines, alcoholic beverages, malt, etc.

Also, despite a twofold increase in the volume of sold products, there was a decrease in sold products in such groups of enterprises as **10.5** production of dairy products, **10.6** production of products of the flour-milling and semolina industry, starch and starch products, **10.7** production of bread, bakery and flour products. Their share in the structure of sold products of the food industry fell from 20% to 18%. Accordingly, their production decreased. In general, it can be stated that the sale of food industry products in almost all groups of enterprises has decreased to varying degrees.

It is also important to analyze the production efficiency of all branches (sections) and groups of enterprises, one of the key indicators of which is the profitability of enterprises. There are two types of profitability: **operating** and all or **general** [7, p. 125]. The profitability of operating activities depends on two values: profit and expenses from operating activities. **The level of profitability** of operating activity is defined as the ratio of profit from operating activity to the amount of operating expenses and characterizes the profitability of this activity, namely: how much profit is generated per 1 hryvnia of incurred expenses, that is, it informs about the profitability for the company of production of products, performance of works, provision of services, sale of goods. At the same time, operating profit (from the main activity of the enterprise, i.e. production and sale of products, services, works) covers a large number of transactions performed at various stages of the movement of monetary and material resources, which ensure the receipt of net profit. There is no normative value for profitability indicators, but there is a rule: the higher the value of the coefficient, the more efficient the company's activity is considered.

Total profitability is a generalizing indicator of the economic efficiency of an enterprise or industry, which is equal to the ratio of gross (balance sheet) profit obtained for a certain period of time (year) to the average value of the fixed and normative share of working capital for this period.

Listed in the table. 3 regarding the profitability of branches (sections and groups) of the food industry, statistical data for 2015-2021 indicate that the pre-crisis 2020 of the studied period was the most effective among them. In particular, this conclusion is supported by the highest profitability indicators for the following groups of enterprises: **10.4** - operating profitability is 4.1%, **10.8** - 11.1%, **11.0** - 6.5%, **12.0** - 28.1%. Together, they cover 63% of the food industry's sold products.

Table 3. Level of operational and overall activity of food industry enterprises of Ukraine, %

Branches (sections and groups)	Profitability	2015	2016	2017	2018	2019	2020	2021	2021-2015
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
TOTAL (10+11+12); from it:	operational	**3,0**	**2,8**	**5,1**	**4,9**	**5,1**	**5,3**	**4,0**	**1,0**
	General	**-3,3**	**-1,3**	**1,4**	**2,3**	**3,6**	**0,7**	**2,5**	**5,8**
10 Production of food products	operational	**2,7**	**3,2**	**5,0**	**4,2**	**3,9**	**4,2**	**3,3**	**0,6**
	General	**-3,2**	**-0,9**	**1,3**	**1,7**	**2,5**	**-0,1**	**1,8**	**5,0**
10.1 production of meat and meat products	operational	**6,7**	**6,3**	**9,9**	**6,9**	**6,8**	**0,6**	**6,0**	**-0,7**
	General	**1,7**	**2,7**	**7,8**	**4,0**	**5,5**	**-3,1**	**4,9**	**3,2**
10.2 processing and conservation of fish, crustaceans and mollusks	operational	**2,8**	**-0,1**	**0,7**	**2,4**	**1,6**	**0,9**	**1,3**	**-1,5**
	General	**1,0**	**-1,4**	**-0,4**	**1,6**	**0,6**	**-0,2**	**0,7**	**-0,3**
10.3 processing and preservation of fruits and vegetables	operational	**1,2**	**2,8**	**7,5**	**6,3**	**8,5**	**4,1**	**7,8**	**6,6**
	General	**-4,9**	**-2,7**	**2,9**	**2,8**	**7,0**	**-0,1**	**5,8**	**10,7**
10.4 production of oil and animal fats	operational	**-0,4**	**1,5**	**2,0**	**2,2**	**1,8**	**4,7**	**1,7**	**2,1**
	General	**-7,1**	**-2,4**	**-1,0**	**-0,1**	**0,9**	**0,5**	**0,5**	**7,6**
10.5 production of dairy products	operational	**1,5**	**3,4**	**4,3**	**3,3**	**3,7**	**3,6**	**1,1**	**-0,4**
	General	**-4,1**	**-1,0**	**1,6**	**1,9**	**2,7**	**0,7**	**0,0**	**4,2**

10.6 production of products of the flour mill and grain industry, starch and starch products	operational	**4,3**	**3,2**	**5,7**	**4,7**	**-3,8**	**0,4**	**-1,3**	**-5,6**
	General	**0,1**	**0,1**	**-11,7**	**1,7**	**-6,3**	**-13,9**	**-3,4**	**-3,5**
10.7 production of bread, bakery and flour products	operational	**4,1**	**1,9**	**3,0**	**3,2**	**3,1**	**1,9**	**0,9**	**-3,2**
	General	**-4,5**	**-0,8**	**0,5**	**0,3**	**1,6**	**0,5**	**-0,2**	**4,3**
10.8 production of other food products	operational	**7,5**	**7,6**	**8,4**	**6,6**	**7,9**	**11,1**	**9,4**	**1,9**
	General	**1,4**	**1,7**	**5,4**	**3,8**	**5,5**	**7,4**	**6,7**	**5,3**
10.9 production of ready feed for animals	Operational	**0,8**	**2,5**	**5,5**	**5,7**	**7,7**	**5,6**	**5,9**	**5,1**
	General	**-0,6**	**0,5**	**3,2**	**3,6**	**5,5**	**3,1**	**4,1**	**4,7**
11 Production of beverages	operational	**4,2**	**5,2**	**4,6**	**4,6**	**8,1**	**6,5**	**3,6**	**-0,6**
	General	**-4,1**	**1,5**	**2,4**	**2,5**	**5,8**	**1,7**	**2,6**	**6,7**
12 Production of tobacco products	operational	**5,9**	**-10,0**	**9,0**	**23,1**	**26,9**	**28,1**	**25,2**	**19,3**
	General	**-4,6**	**-14,5**	**3,1**	**15,5**	**24,1**	**16,1**	**19,9**	**24,5**

Compiled and calculated according to: Profitability of operating and all activities of enterprises by types of economic activity. URL: https://ukrstat.gov.ua/operativ/menu/menu_u/sze_20.htm.

The most stable group of enterprises among all branches of the food industry in terms of operational profitability of production was group **10.8** - its average arithmetic value for seven years is 8.35% (variation of indicators 6.6-11.1%), and the total profitability is 4.55% (variation of indicators 1.4-7.4%). At the same time, the most variable was the group of enterprises **11.0** – operating profitability in the range of -10.0-28.1% (average for the researched period 15.4%), and total profitability - 14.5-24.1% (average for the researched period 8.5%). Such distortions testify to the variability of the situation regarding the tobacco industry and its products both directly in Ukraine and on the global tobacco market.

The group of enterprises **10.6** became the most variable in terms of overall profitability – its profitability in the range of -13.9-1.7% (average for the studied period -4.8%), and operating profitability - -3.8-5.7% (average for the studied period 1.9%). Loss-making total profitability is due to additional non-operating costs and losses. These include losses from the maintenance of subsidiary agriculture, the provision of motor transport services, the sale of intangible assets and production stocks, expenses for the social needs of the development of collectives, etc.

Of particular interest is the profitability of production, which is determined by the size of enterprises. In Ukraine, economic entities, depending on the number of employees and income from any activity per year, may belong to small business entities, including micro, medium, or large business entities.

Micro-entrepreneurs include natural persons-entrepreneurs (PE) and legal entities - business entities of any organizational and legal form and form of ownership, in which the average number of employees for the reporting period (calendar year) does not exceed 10 persons and annual income from any activity does not exceed the amount equivalent to 2 million euros, determined at the average annual exchange rate of the National Bank of Ukraine.

Small business entities are sole traders and legal entities, in which the average number of employees for the reporting period (calendar year) does not exceed 50 people and the annual income from any activity does not exceed the amount equivalent to 10 million euros.

Subjects of large entrepreneurship are legal entities - business subjects of any organizational and legal form and form of ownership, in which the average number of employees for the reporting period (calendar year) exceeds 250 people and the annual income from any activity exceeds the amount, equivalent to 50 million euros, determined at the average annual exchange rate of the National Bank of Ukraine.

Other business entities belong to medium-sized business entities [8, Art. 55].

The first most acceptable economic indicator "financial results before taxation of enterprises" reveals their dynamics in the studied period (Table 4). The results show that in the crisis and the first post-crisis years, the food industry suffered a loss as a result of more than 1.7- and 1.3-fold excess of the negative financial result over the positive one. In the future, this did not happen: the profit almost doubled, and the loss decreased several times. 2020 could also be a crisis year, but the "safety margin" (profit) almost doubled the sharply (tripled) increased loss, and therefore the overall result was positive.

Table 4. Financial results before taxation of enterprises for 2015-2021*, thousand UAH.

Production	Years	Financial result (balance) before taxation	Enterprises which made a profit		Enterprises that received a loss	
			As a % of the total number of enterprises	Financial result	As a % of the total number of enterprises	Financial result
1	**2**	**3**	**4**	**5**	**6**	**7**
	2015	-14600557,5	72,3	19667285,3	27,7	34267842,8

Production of food products, beverages and tobacco products; Sections 10+11+12	2016	-5965156,5	71,1	18151343,0	28,1	24116499,5
	2017	11952832,1	69,6	27021573,4	30,4	15068741,3
	2018	19635756,9	70,5	27651752,5	29,5	8015995,6
	2019	33851600,0	71,3	39464500,0	28,7	5612900,0
	2020	15589400,0	69,1	33743300,0	30,9	17883900,0
	2021	26292403,5	68,2	37149970,1	31,8	10857566,6

*Source: Financial results before taxation of enterprises by types of economic activity for 2010-2021. URL: http://ukrstat.gov.ua/operativ/menu/menu_u/sze.htm.

It is appropriate to draw attention to the fact that in the crisis year the share of unprofitable enterprises did not exceed 28%, but the losses were the highest for the entire period under study. This means that the losses per enterprise were so high, compared to other years, that the food industry recovered from this situation even in the post-crisis 2016, and completely overcame them only in 2017. The share of unprofitable enterprises in 2021 was the highest, i.e. 31.8%, but losses did not exceed UAH 10,857.6 million, and this made it possible to maintain profitability at a decent level of 4.0%.

The next economic indicator is the profitability of production. In the table 5 operational and general profitability of food industry enterprises is revealed in dynamics and according to the hierarchy of enterprises by size. One pattern is evident: among all enterprises, in the 2015-2016 crisis, medium-sized structures dominated in terms of profitability, and in 2017-2021, large units dominated. In particular, in the crisis years, the operating profitability of medium-sized enterprises was 3.3-3.4%, and of large enterprises - 2.6-3.1%, in the following years, respectively, 2.7-4.7% and 5.1-7, 5% This situation can be explained as follows: the effect of scale, that is, the size of the enterprise, directly correlates with economic indicators in normal, that is, in non-crisis conditions, and in crisis periods, medium-sized production structures proved to be more efficient and stable.

Table 5. Profitability of operational and overall activity of enterprises of the food industry of Ukraine, divided into large, medium, small and micro enterprises*, in %

Years	The level of profitability (unprofitability) of the operational activities of enterprises					The level of profitability (unprofitability) of all enterprise activities				
	Total	including				Total	including			
		Big	average	are small	of them micro-		big	average	are small	of them micro-
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
2015	**3,0**	**3,1**	**3,4**	**-0,9**	**-6,2**	**-3,3**	**-3,3**	**-3,4**	**-3,5**	**-11,7**
2016	**2,8**	**2,6**	**3,3**	**0,1**	**-7,7**	**-1,3**	**-1,7**	**-0,8**	**-1,9**	**-9,4**
2017	**5,1**	**6,0**	**4,7**	**0,5**	**-4,8**	**1,4**	**3,6**	**1,1**	**-13,2**	**-7,9**
2018	**4,9**	**6,7**	**3,2**	**1,2**	**-0,9**	**2,3**	**3,9**	**0,7**	**-0,3**	**-4,3**
2019	**5,1**	**5,9**	**4,6**	**1,5**	**-0,3**	**3,6**	**4,3**	**3,1**	**0,5**	**-2,6**
2020	**5,3**	**7,5**	**3,4**	**0,8**	**-6,4**	**0,7**	**1,5**	**0,0**	**-1,1**	**-8,9**
2021	**4,0**	**5,1**	**2,7**	**1,2**	**-3,2**	**2,5**	**3,4**	**1,6**	**0,0**	**-4,7**

Source: Profitability of the operating and all activities of enterprises by type of economic activity, with distribution into large, medium, small and micro enterprises in 2010-2021. URL: http://ukrstat.gov.ua/operativ/menu/menu_u/sze.htm.

At the same time, small enterprises are also directly correlated with the published conclusion: in the crisis years, the operating profitability was -0.9-0.1%, and in the post-crisis period - 0.5-1.5%. But the situation in micro-enterprises is even worse - operating profitability in the crisis years was -7.7--6.2%, and in the post-crisis period - 6.4-0.3%. Therefore, operating profitability depends on the size of enterprises, but with an adjustment for crisis or post-crisis years. Dependence on the degree of innovativeness of enterprises is not observed, since the implementation of innovative products is less than one percent.

A similar pattern can be observed in the overall profitability: in the post-crisis years, the variation of indicators for large enterprises is 1.5-4.3%, for medium-sized enterprises - 0.0-3.1%. But this dependence is somewhat distorted for the crisis period of time, since there was a loss of efficiency: the variation of total profitability indicators in the crisis years for medium-sized enterprises was -3.4-0.8%, for large ones -3.3-1.7%. That is, non-operational costs and losses were so large-scale that the overall profitability was ultimately brought to a loss.

Conclusion. In the studied period, the innovativeness of the food industry enterprises according to the main indicators was at a very low level, as a result of which their minor fluctuations did not manage to lead to noticeable positive changes. In order to radically improve the situation, it is necessary to make significant adjustments to the financing of innovative activities, increase the number of innovative developments of the new generation and breakthrough technologies and their introduction into processing and food production,

increase the production of new innovative products for the market, etc.

The sale of food industry products more than doubled in seven years, and the profitability of production was divided into two parts: the first two years (2015-2016) the operating profitability was low, and in the following years (2017-2021) it increased to a significant value. Moreover, in the first period, medium-sized enterprises dominated in terms of profitability, and in the second - large production units. And a similar regularity can also be traced in relation to the overall profitability. In this way, profitability depends on the size of enterprises adjusted for crisis or post-crisis years. The innovativeness of enterprises does not affect the profitability of production, but this is due to the fact that the implementation of innovative products in the total amount of realized industrial products is less than one percent.

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