

Ensuring environmental safety of the food industry: Influence on leadership positions in the economy

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The purpose of the article is to substantiate the peculiarities of ensuring environmental safety of products of the food industry. The problems of ensuring environmental safety of the food industry have been identified and the current state and the trends of food industry development in Ukraine have been analyzed. For increasing the leadership positions of the food industry of Ukraine in order to ensure its environmental safety, it has been proposed to strengthen the effective interaction of all interested parties - the state, food industry enterprises, agricultural producers and research institutions.

Keywords: Economy; Ecological safety; Food industry; Competitiveness

Introduction

One of the important directions of stabilization of the leadership positions of the national economy in the international market is to ensure the health of the nation, including through food products. Today, the environmental safety of food is a global problem that affects not only health but also the welfare of the state as a whole. In Ukraine, there are no effective mechanisms for eliminating the negative factors influencing food safety. Access to food products, their quality and ecological compatibility affects the level of food security of the state, serve as indicators of its social stability. Therefore, the choice of the innovative development direction, ways to overcome the problems of the industry should be based on scientifically based analytical data and clear strategic directions of management of the leadership qualities of the food industry in Ukraine. Thus, the issue on the research of the perspectives for food industry leadership for the comprehensive improvement of the system for ensuring the production of environmentally safe food products, increase in the ecological image of the country and the competitiveness of the food industry on the domestic and foreign markets is relevant.

In accordance with the Law of Ukraine On Quality and Safety of Food Products and Food Raw Materials as amended by the Laws of Ukraine, a safe food product is a food product that does not have a harmful effect on human health, directly or indirectly, in the conditions of its production and circulation with compliance for sanitary measures and consumption (use) by appointment (The Law of Ukraine On Quality and Safety of Food Products and Food Raw Materials As amended by the Laws of Ukraine).

R.I. Shevchenko has paid attention to a thorough analysis of the concept of "environmental safety of food products" and interprets the concept as a characteristic of the set of material, energy and information flows, processes and phenomena that determine and accompany them, and are their consequences and constitute a complete life cycle of food products as a factor that, to some extent, affects the stability of the system "environment-human" and a person directly (Shevchenko, 2015).

S.M. Romanenko notes rightly that environmentally safe products may contain maximum permissible concentrations of harmful substances, thus, pesticides, agrochemicals, plant protection products can be used during its production, and the production of environmentally safe products should be based on organic farming technologies in specially prepared conditions, creating special zones remote from industrial enterprises, in ecologically safe, radioactive contaminated areas, without application of genetic engineering achievements (Romanenko, 2008).

The analysis of scientific developments makes it possible to distinguish two main groups of factors that influence the environmental safety of food products: the first group is the state of the environment; the second group covers the raw materials for food production - these are products of plant and animal origin and technologies for their cultivation and processing. Consequently, statistics show that the main danger is hidden in food products. In addition, in accordance with data, up to 70-80% of the total amount of heavy metals entering the human body comes from plant products (The Official Website of the State Statistics Service of

Ukraine). The second group that we have isolated needs more attention since it is the technology of production, processing and storage of food that is the riskiest. The use of imperfect technology and equipment in food production lead to the entry of harmful impurities into the final product or the generation of harmful substances during the production process.

On the basis of the analysis of existing scientific and theoretical approaches, it has been described the essence of the category of "leadership innovative potential of the food industry" as a complex system of ensuring the high quality of products by the food industry enterprises and feedback between industry, science and society in the context of combining financial, intellectual, technical, informational, human capitals, which takes into account the interdependence of technological processes and the qualification level of the personnel.

Materials and Methods

To achieve the purpose of the article, a set of general scientific and specific methods of scientific knowledge has been used, in particular: abstract-logical (for substantiation of the research methodology, theoretical generalizations, formulation of conclusions); dialectical, historical-logical, analysis and synthesis, induction and deduction (for determination of the preconditions for ensuring environmental safety of products of the food industry through the development of its innovative potential); statistical-economic (for assessment of the current state of development of the food industry and identification of the factors that affect its environmental safety); strategic and structural-functional analysis (for correction of the strategic directions of the development of innovative potential of food industry to maintain its environmental safety).

Results and Discussion

Today, unfortunately, we cannot talk about the proper state of the environment. The reasons for this are the following: electric power stations, plants and factories emit tons of harmful gases into the atmosphere; content of toxic substances in exhaust gases of cars exceeds the generally accepted norms considerably; industrial enterprises pollute water pools with their sewage and hundreds of hectares of fertile land remain unused. As a result, a lot of agricultural raw materials, suitable for the food and processing industry, hasn't been obtained, and much of them became dangerous to humans.

However, it is precisely the technology of production, processing and storage of food products is the most dangerous. The use of imperfect technology and equipment in the production of food products leads to the entry of harmful impurities into the final product or the generation of harmful substances during the production process, which, in turn, requires additional socio-economic measures to solve the problem.

In Ukraine, almost a sixth part of fruit and vegetables contains nitrates in doses that exceed the maximum acceptable level. In the first place, excessive nutrient content in food products contributes to the development of cancer and allergic diseases. Excessive nitrate in fruit and vegetables is not only a consequence of improper use of nitrogen fertilizers but also the result of the sorption of nitrogen oxides directly from the atmosphere, which are formed during combustion of different types of fuel. Insufficient lighting and thickening of crops are the main causes of excessive nitrates in vegetables from the covered ground (greenhouses, hotbeds, etc.) (Velychko, 2011; Nyzhnyk, 2013; Novoitenko, 2016).

Particular attention should be paid to the threats that arise as a result of an increase in the total volumes of mineral fertilizers and, in turn, reduction of organic fertilizers (Table 1) (use of organic fertilizers, which are the main source of replenishment of nutrient reserves in the soil, increase of humus content, as well as the conservation and extended reproduction of soil fertility, tend to decrease). During 2017, the average level of manure maintenance in soil reached 0.5 t / ha, while to maintain the necessary humus content, its value should be within the range of 8-14 t / ha depending on the natural conditions and geographic location of the land resources. This situation arose as a result of a decrease in livestock development and a reduction in the efficiency of harvesting and storage of waste.

Table 1. Dynamics of use of organic fertilizers in Ukraine in 1990-2017.

Indicators	Years						
	1990	2000	2005	2010	2016	2017	2017 to 1990 (%)
Use of organic fertilizers, mln tons	257	28.4	13.2	9.8	9.9	9.6	3.7
Use of organic fertilizers per ha of agricultural land, tons	8.6	1.3	0.8	0.5	0.5	0.5	5.8
Share of area treated with organic fertilizers in total agricultural land, %	18.0	3.3	2.7	2.1	2.2	2.5	13.9

***Source:** (Semenenko, 2017; The Official Website of the State Statistics Service of Ukraine)

The most important place in ensuring the environmental safety of food products takes the State Service of Ukraine for Food Safety and Consumer Protection. However, for today, this authority is assigned too many tasks in various spheres, which does not allow specialized activities. In addition, until recently, control over the production was carried out at the stage of ready-made products, which was not a guarantee of environmental safety in general.

It has been established that efficient, highly productive, dynamically growing food industry is a priority in ensuring the economic security of the state and achieving the leadership of national competitiveness. The term "development of industry" should be understood as a set of quantitative and qualitative changes that involve the transition from one qualitative state to another in conditions of different factors influencing the internal and external environment. Domestic food industry comprises 22 specialized branches, which includes more than 40 major industries. Among the leading industries are the following; meat, oil and fat, confectionery, milk, alcohol, flour, and sugar. In the structure of food production, the biggest share, over 27,94%, is attributed to the products of the oil and fat industry, 13,3% - meat and meat products, 10,5% - dairy products, 11% - beverages.

From 2010 to 2017, the volumes of food industry sales increased by 188 975 million UAH (+ 93%). The share of profitable enterprises in comparison with 2010 increased by 8.3%. But this did not improve profitability. By 2012, net income had a positive growth dynamics, however, during 2014-2017, the rate of decline in profits amounted to an average of 3.1% annually. 2015 was

the most unprofitable for the industry. Operating profitability was at an average level and increased by 1% annually from 2010 to 2015, except in 2017. Furthermore, during the research period, the average salary increased by 3 times and the productivity doubled. However, the number of workers and enterprises engaged in the food industry has decreased by 21% and 25%, respectively, for the past six years, and this fact is a very negative sign, taking into account the growing unemployment rate and the share of industry in Ukraine's GDP. Analysis of the main indicators of the food industry for seven years is presented in Table 2.

Calculations show that in order to create a modern highly developed food industry, the country, needs 20-25 billion UAH of investments. Funding can be made at the expense of foreign and domestic investors, depreciation deductions for reproduction of production potential, bank and tax credits and other sources. Capital investments should be directed primarily to strategic industries, in particular, sugar, oil and meat, canned fruit and vegetables, alcoholic beverages, wine-making, salt and others, which can produce competitive products for the domestic and foreign markets. Due to investments, production capacities and fixed assets are expanded and improved, and the necessary proportions are provided. Investments in the production sphere should ensure the increase in the technical level and the improvement of the location of existing industries, as well as the necessary increase in capacity. It is necessary to make investment decisions on optimization of the structure of assets, determination of the need for their replacement or liquidation; development of methods and means of implementation of investment policy; determination of the need for financial resources; development and approval of investment projects. Therefore, an important stage of the research is the identification of the main factors that influence the investment activity in the food industry and characterize its state and development prospects.

Table 2. Dynamics of the main indicators of the economic activity of food industry enterprises in 2011-2017.

Indicators	Years						
	2011	2012	2013	2014	2015	2016	2017
Number of enterprises, thous.	6551	6559	5768	6407	5528	5502	5198
Profitable enterprises, in % to the total	60.3	59.5	61.7	62.9	62.4	72.3	68.6
Loss-making enterprises, in % to the total	39.7	40.5	38.3	37.1	37.6	27.7	31.4
Sales revenue, mln UAH	192154	222388	254459	261784	302392	398023	381129
Net profit (loss), thous. UAH	2238.8	2303.6	7183.9	6531.7	(16906)	(16553)	(14601)
Number of employees, thousand persons	419.2	427.2	417	404.1	350.8	321	315
Average monthly nominal wage of an employee, UAH	2137	2542	2898	2110	3380	4184	6069
Labor productivity, (thousands UAH per year)	458.3	520.05	610.2	647.8	862	1239	1008
Profitability of operational activity, %	4.5	4.2	6.4	6.1	5.1	6.1	3.8
Total profitability (loss) of activity, %	0.9	0.8	2.5	2.3	(4.5)	(3.3)	(3.6)

*Source: (The Official Website of the State Statistics Service of Ukraine)

From 2012 to 2017, capital investment in the development of the industry had different dynamics. The growth rate from 2012 to 2014 was 10% - 12%. In 2015, the volume of capital investments decreased by 12%, in 2016 it remained at the level of 2015, however, in 2017 it increased by 25% (Figure 1). The main reasons for the decrease in investment activity in the food industry in recent years were the following: economic crisis, inflationary processes; reduction of investment expenditures with the growth of financing of investments from own and borrowed funds of enterprises; unstable financial situation of enterprises of the food industry; lack of state investment strategy; imperfection of legislation.

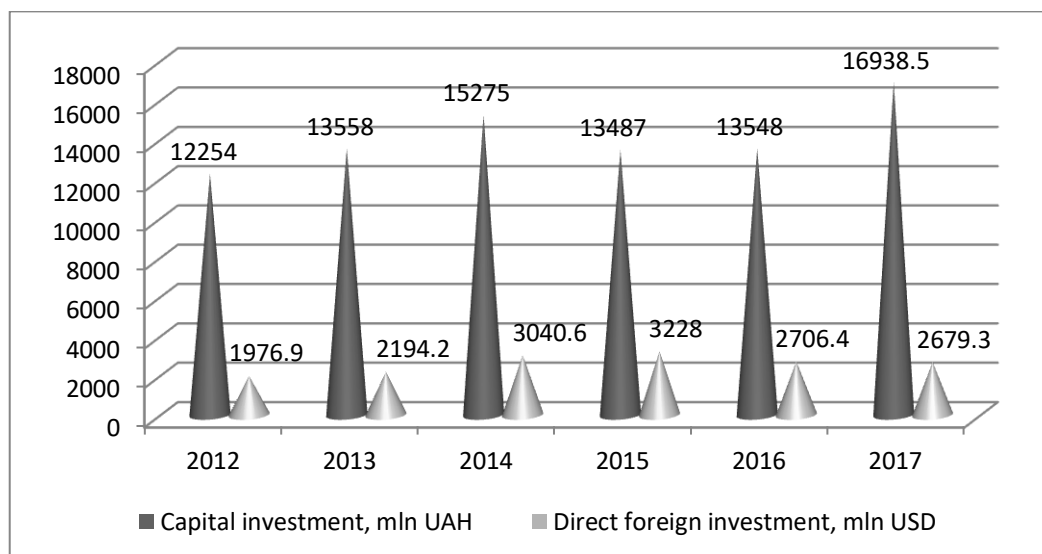


Figure 1. Dynamics of investment in the food industry of Ukraine in 2012-2017.

*Source: (The Official Website of the State Statistics Service of Ukraine).

The food industry enterprises are characterized by low innovation activity, which is a negative factor for the development of socio-economic aspects in the food industry, and as a result, low economic efficiency. The number of introduced innovation processes and the names of innovative products decreased by 48% and 40%, respectively, from 2013 to 2015. The volume of financing of innovation in 2013 amounted to 1 700 695 thousand UAH, including 0.003% from the state budget, 86.7% from own funds, and 8% and 5% accounted for foreign capital and loans. In 2014, the volume of investment in innovation activity increased by 27.8% compared to 2013. At the same time, the investment of foreign investors and the state practically disappeared, the share of own investments decreased by 5%, but the financing of food industry enterprises increased at the expense of loans by 13%. In 2015, the volume of financing of innovation activity of the industry decreased by 30% and by 9.5% in comparison with 2013. In the financing structure, almost all finances consisted of own funds (95.9%), the share of loans decreased by 401.5 million UAH, but new sources of financing appeared: from local budgets at the level of 0.02%, which is much more than financing of the development of innovation activity from the state budget.

Growth in the production of innovations in the industry leads to an increase in its exports and does not lead to saturation of the domestic market with this kind of products, the potential of which Ukrainian experts estimate at the level of 80 billion UAH. This increases the risks associated with the fact that domestic market needs will be met by increasing imports of cheaper, deep-processed products to Ukraine.

The analysis of the development of the food industry in Ukraine allowed substantiating the current problems of stabilizing the leading positions in the economy. These problems include: state regulation of prices and profitability of food industry enterprises; lack of state support for the renewal of fixed assets; lack of loyal innovation and investment climate for the development of the food industry; legal and regulatory framework that needs to be updated in accordance with the socio-economic changes taking place in the country; weak development of infrastructure and logistics system; high cost of production; lack of effective marketing activity; weak interaction of agricultural producers of raw materials, processing enterprises, trade intermediaries, suppliers on the basis of cooperation; ineffective control system, etc.

Taking into account existing tendencies and problems of functioning of the food industry of Ukraine, the priority ways of its leadership for ensuring environmental safety are the following: improving product quality; constant renewal and increase in a range of products; expanding target markets. The food industry enterprises can act as innovators, that is, to use new technologies and developments to create and improve products that meet the needs of the modern consumer. The benefits of this solution are that the producer obtains the opportunity to become a leader, on the other hand, he bears a certain cost on scientific development, that is, bears the risk associated with a possible failure in the market with new products. The factors that negatively influence the effectiveness of the development and introduction of a new product are the following: insufficient or poor quality of products; discrepancy of the new products with the requirements of the market; insignificant advantages over competitors' products; unpredictable reaction of competitors; insignificant segment of the market or change of segments of consumers; unsuccessful positioning on the market; weak support from distribution channels; changes in the macro environment; insufficient level of profitability; organizational problems, etc.

It has been substantiated that an important strategic direction for stabilization of the food industry leadership of Ukraine to ensure its environmental safety is the establishment of effective interaction of all interested parties - the state, food industry enterprises, agricultural producers and research institutions. The first priority is the need for the formation of sustainable development of agricultural producers and the modern food industry. The complex of measures should settle the matters on increasing the volumes of the production of high ecological quality raw materials, increasing the technical level of food and processing enterprises, creating fundamentally new environmentally safe technologies for food production. It is advisable to form an effective partnership based on the geographical location of business entities. Therefore, it is necessary to form and implement the new model for the state regulation of the formation and development of the innovative potential of the food industry of Ukraine. It should be based on the complex interaction between the state, food industry enterprises, agricultural producers and research institutions. The proposed model, which includes the project, functional, resource, organizational and managerial components of the innovation potential of the food industry, will provide an opportunity to obtain significant economies on the scale of production of environmentally safe products, as well as to reduce costs on packaging and production of new products, to create the necessary conditions for the interaction of science and production. Such interaction will allow achieving a synergistic effect, strengthening the common opportunities of all parts of domestic production in the creation of competitive technologies for the production of environmentally safe products and access to world markets.

Conclusion

Now-a-days, most food products produced in Ukraine can not act as leaders in the world market due to the inadequate control both over emissions to the natural environment and at all stages of food production. Ukrainian production does not use rich international experience and is characterized by high financial costs, which is not profitable for our country due to the absence of state support. Therefore, drawing attention to food production safety by improving the state policy for the development of the innovative potential of the food industry should be one of the priority tasks for Ukraine. The main indicators of food industry development have been analyzed. It can be noted that the food industry is a rather promising and competitive industry over the past few years. Its production and export potential is powerful and has a strategic impact on the formation of Ukraine's GDP. The decline in the efficiency of financial and economic activity in the last seven years is mainly observed by individual sub-sectors, product subgroups. The main reasons for such tendencies are the following: economic and political situation in the country and the world as a whole; state of raw material base and purchasing power of the population; lack of working capital; lack of clear innovation policy; high cost of foreign technologies. The new model for state regulation of the leading positions of food industry of Ukraine has been proposed, which is based on the complex interaction of the state, food industry enterprises, agricultural producers and research institutions. It has been noted that implementation of this model will allow achieving a synergistic effect, strengthening the common opportunities of all parts of domestic production in the creation of competitive technologies for the production of environmentally safe products and access to world markets. Organization of the process for formation of a coherent vision of the leadership of the food industry in Ukraine for all interested groups of participants through consolidation of public opinion will allow state authorities to react in a timely manner to changes in the development of the food industry and to adjust industrial policy taking into account their interests and the needs of the system of ensuring environmental safety.

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