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Trends of the Development of the Meat Processing Industry of Ukraine and Practical Approaches to the Optimization the Recipe of Sausage Products

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► **Abstract.** Today, Ukraine is forced to perform a complex geopolitical task in order to guarantee not only military, but also food security. Therefore, the issue of increasing the efficiency of the meat processing industry, as one of the components of this task, is significant and relevant. The purpose of the article is to substantiate the economic aspects of increasing the efficiency of the functioning of meat processing enterprises of Ukraine as a result of improving the recipe of sausage products in order to reduce their cost price. The research was conducted using general scientific methods and techniques: logical and qualitative analysis and synthesis, monographic method, system-structural analysis method, cause-and-effect analysis method, experimental method, economic-statistical method, calculation-constructive method and method of logical generalization. The results of the research in the form of practical recommendations for reducing the cost of sausage products as a result of changing the cost norms and improving the product formulation can increase the economic efficiency of meat production. In order to reduce the cost of meat products, the recipe of products has been changed due to the rejection of expensive ingredients. The scientific novelty of the research results lies in the development of practical approaches to the study and analysis of dynamic processes in the meat processing industry based on the policy of stimulating demand for competitive products both in the Ukrainian and foreign markets. The article highlights the problems of the current state of the meat industry in Ukraine, the prerequisites and the main causes of this situation. The article deepens practical approaches to improving the recipe of sausage products, evaluates their updated recipe in order to reduce the cost of production and increase its efficiency, which lays the foundation for future research for other types of products

► **Keywords:** production, consumption, quality, cost price, efficiency, level of profitability

► Introduction

Today, Ukraine is going through a very difficult period. The protracted events in the East and Russia's military invasion, the uncertainty of the future, and the sharp and dynamic devaluation of the UAH could not but affect the meat processing industry. Among the main problems, there are constant decline in the purchasing power of meat products, disruptions in the supply of quality raw materials and its rise in price. The enterprises of the branch buy the majority of raw materials abroad. As a result of the devaluation of the UAH, its price is rising, which has led to higher prices for meat processing products. Declining incomes and purchasing power had a negative impact on sales [1].

The meat industry provides the population with meat, semi-finished products, and finished products. In terms of the cost of production, this

industry ranks first in the food industry. In large cities, there are meat-processing plants, which comprehensively process livestock products. However, it is necessary to locate such enterprises closer to the areas of developed livestock to reduce the cost of transportation. The promotion of Western companies and increased competition on the Ukrainian market, as well as the movement towards the creation of a common economic and informational environment, require a quick response of Ukrainian enterprises to market changes. Moreover, competitive are those companies that are flexible and dynamically developing, apply innovations to reduce costs and increase business efficiency. It should be noted that currently meat-processing enterprises operate in conditions of shortage of raw meat, its high cost and inability to choose the quality [2]. This

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situation is exacerbated by hostilities, which lead to the death of animals, destruction of enterprises and disruption of logistics chains.

The deepening of various economic transformations in Ukraine is carried out against the background of complex and dynamic changes in the external environment and is accompanied by unpredictable risks and uncertainty of production processes in almost all sub-sectors. This leads to the need to learn to carry out economic activities in unstable conditions. An important role in solving the problems of food security, saturating the market with high-quality and highly nutritious meat products and satisfying the needs of the population, and the maximum use of all production capacities of meat processing enterprises is played by the intensity of the development of the livestock industry [3].

The inhibition of agrarian reform did not develop interaction and mutual support of commodity producers, intermediaries, processing enterprises and product consumers, which led to a decline in the meat processing industry. Current issues and strategic goals today are ensuring resource security with food products by increasing production by food enterprises, stable supply of products, in particular meat, in various market conditions, availability of quality food products for all segments of the population, regardless of income. The current consumption of meat products by the population is at a rather low level, in addition, its taste qualities deteriorate and its value as a food product decreases [4]. The low capacity of the domestic meat market does not contribute to the improvement of the quality of products of meat processing enterprises, their effective production activity.

Given the above, measures to increase the efficiency of the functioning of enterprises of the meat product sub-complex are specifically important. Cattle breeding, pig breeding and poultry farming play an important role in solving the problems of increasing the production of meat and meat products. The issue of matching supply and demand on this market, as well as establishing parity relations between agricultural and processing enterprises, also needs to be resolved.

The need and urgency of comprehensive research into the meat product sub-complex of Ukraine is indicated by the instability of the economic and social situation and development, adequate state support for animal husbandry, weak export potential and slow modernization of the livestock industry [5].

The market of meat and meat products occupies an important place in the socio-economic development of Ukraine, being at the same time one of the factors of efficiency of the meat sector. The meat industry is the basis of the national economy, which provides food production, which is an important condition for the development of society. Its main strategic objectives are to increase the efficiency of meat processing enterprises and to support intensive development in order to improve product quality, better meet the needs of industry in raw materials and consumers in food.

However, to this day, the issues of creating appropriate conditions for the sale of meat and meat products that would meet the needs and interests of sellers and buyers in this market remain unresolved.

A significant scientific work dedicated to the study of aspects of the functioning and development of the meat sub-complex as a system of economic relations, the purpose of which is to provide the population with meat and meat products, was made by I. Svyynous [6], V. Mesel-Veselyak [7], M. Heigermoser and T. Glauben [8], M. Ibatulin [9] etc.

However, a number of important problems in the formation of stable and efficient development of the meat processing industry have not yet been properly resolved. Further research is needed on the development of an effective market mechanism for economic relations between raw meat producers and processors. Therefore, the solution of the above issues may require a comprehensive approach aimed at improving the economic efficiency of meat production.

The purpose of the article is the analysis of the current state of the enterprises of the meat product sub-complex, research and justification of the economic aspects of increasing the efficiency of the functioning of the enterprises of the meat processing industry of Ukraine due to the improvement of the recipe of sausage products caused by the addition of non-traditional raw materials in order to reduce their cost price.

► Materials and Methods

The theoretical and methodological basis of the conducted research is the dialectical method of cognition, a systematic and comprehensive approach to the study of Ukrainian and foreign scientific provisions on the basic principles of analysis and factors influencing the efficiency of the processing enterprises of Ukraine by improving the recipe of sausages to reduce their cost. To achieve this goal, the following methods were used: monographic method – to study and systematize Ukrainian and foreign scientific achievements and practical experience in determining aspects of the functioning and development of the meat industry of Ukraine; method of system-structural analysis – for the analysis of the current state of operations of enterprises in the meat processing industry; method of cause-and-effect analysis – when identifying problems in the activities of enterprises of the meat product sub-complex and the meat industry; economic and statistical method – to study and generalize trends and patterns of dynamics of enterprise efficiency, calculation and design method – to calculate the main financial and economic results, the method of logical generalization – to form conclusions and proposals.

Analytical materials of the article were based on relevant official statistics.

Experimental studies were conducted in research laboratories Department of Meat, Fish and Seafood Technology of National University of Life and Environmental Sciences of Ukraine, Institute of Food Resources of NAAS of Ukraine, and Palladin Institute

Biochemistry of the National Academy of Sciences of Ukraine.

During the experimental studies, the methods of determining the organoleptic, functional-technological, physical and chemical and microbiological parameters of the control and experimental samples were used in order to improve the quality and safety of the finished product. The research was conducted according to regulatory standards. Preparation of samples for organoleptic, physical and chemical, functional-technological and microbiological indicators was carried out in accordance with DSTU 31499-2012 [10], and sampling – in accordance with DSTU 26671-85 [11].

The result of the research was the development and improvement of the recipe of cooked sausages with the addition of non-traditional raw materials and replacement with cheaper ones, the calculation of economic efficiency and price competitiveness of products.

► Results and Discussion

Currently, especially in the conditions of martial law, one of the main reasons for the decrease in the efficiency of meat processing enterprises is the breakdown of economic ties between agricultural and processing enterprises. This led to a reduction in the production of meat products. In order to resolve the current situation, it would be necessary to improve the agro-industrial integration of agro-enterprises with processing.

The food industry is acutely aware of the problem of creating a sustainable competitive advantage, as the reduction in production; livestock and productivity significantly affect the efficiency of the meat complex. Despite the fact that Ukraine has all the necessary conditions for the development of processing, the dynamics of livestock and meat production have a negative trend (Fig. 1, Table 1).

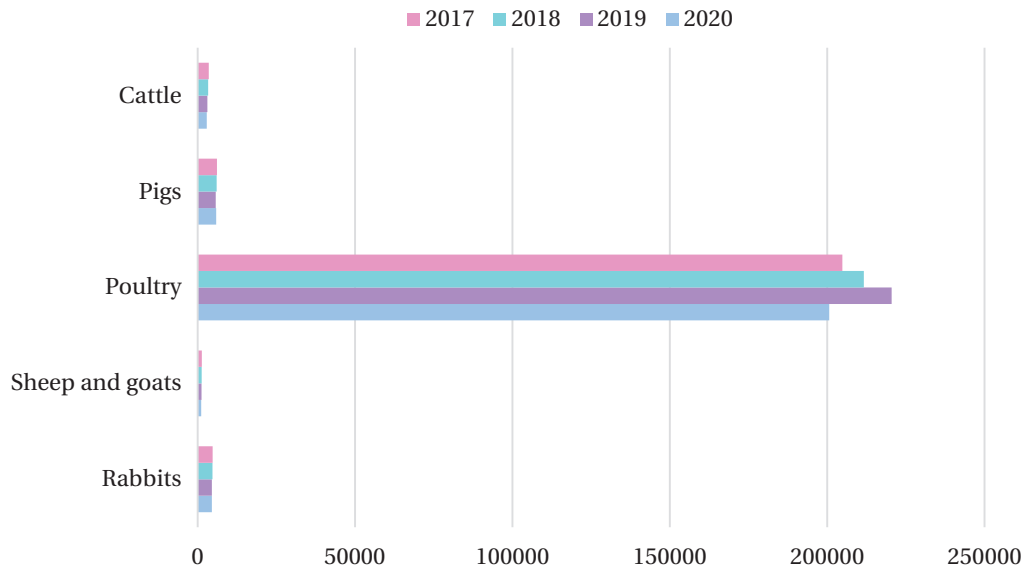


Figure 1. Livestock in 2017-2020, thousand heads

Source: State Statistics Service of Ukraine; Authors' depiction

The analysis of the dynamics of the animal population shows an annual decrease for all animal species for the period from 2017 to 2020. This situation is caused by economic and social factors. In particular, the reduction in livestock happened because of unprofitable production activities, lower sales prices, and long periods of rearing of individual animals (for example, cattle).

The products of meat processing enterprises occupy a significant place in the human diet; therefore, this branch is among the main ones in the Ukrainian food industry. Its development depends on the demand and supply of the population of Ukraine with food products made of meat. Paying attention to the current variability of the economy and crisis phenomena directly in the meat industry, it is necessary to analyze the market of meat and meat products and consider the main factors affecting the economic efficiency of meat processing enterprises.

Due to such factors, enterprises can more effectively adapt to various changes and prevent bankruptcy. Exiting the market of every meat processing enterprise or simply reducing production threatens the food security of not only Ukraine, but other countries, because today the domestic production of beef and chicken has a strong export orientation. Accordingly, in order to prevent a food crisis, it is necessary to study the activities of enterprises in the market of meat and meat products as producers of one of the most important food products [12].

Balanced nutrition is characterized by the volume of consumption of livestock products, which is the main source of protein and meets the needs of the human body by 60% [13]. The recommended rational amount of meat consumption per person per year is 80 kg, and the minimum is 45 kg [14; 15]. According to statistics, the volume of meat production in recent years is shown in Table 1.

Table 1. Meat production in Ukraine for 2017-2020

	2017	2018	2019	2020	2020 in % to 2017
Meat in slaughter weight, thousand tons	2318,2	2354,9	2492,4	2477,5	106.9
including per 1 person, kg	54.6	55.7	59.3	59.3	108.6
Beef and veal, thousand tons	363.5	358.9	369.5	345.4	95.0
consumption per capita, kg	8.6	8.5	8.8	8.3	97.0
Pork, thousand tons	735.9	702.6	708.3	697.2	95.0
consumption per capita, kg	17.3	16.6	16.9	16.7	97.0
Poultry meat, thousand tons	1184,7	1258,9	1381,4	1404,7	119.0
consumption per capita, kg	27.9	29.8	32.9	33.6	121.0
Other meat, thousand tons	34.1	34.5	33.2	30.2	89.0
consumption per capita, kg	0.81	0.82	0.79	0.73	91.0

Source: State Statistics Service of Ukraine; authors' calculations

In recent years, the production of all types of meat has declined, except for poultry. The growth of 19% is mainly due to the production of chicken, which provides a quick profit due to the fairly fast production cycle. That is why investors prefer to invest in this industry of poultry. Another key raw material for the meat processing industry is pork, the volume of which has the smallest reductions – by 5%. It is a more traditional food product in the diet of Ukrainians and also has a fairly short production cycle. All this makes it an investment-attractive industry as well.

Recently, the total consumption of meat in Ukraine per capita has slightly increased (by 8.6%), mainly due to poultry meat, as the volume of all other species is declining. However, this indicator, although higher than the minimum need, is insufficient in relation to the recommended norm [15].

One of the biggest problems is the inability to provide enterprises with domestic raw materials, which are reimbursed by imported products of poor quality. Currently, farms have a fairly low level of load due to lack of raw materials and insufficient demand for finished products due to reduced purchasing power of consumers [15]. There is a clear link between affluence and meat consumption. In addition, a negative contribution was made by the increase in the prices of materials, which led to an increase in the cost of finished products. All these factors together have a negative impact on the financial results of most farms [16]. Unfortunately, now there is a situation of decreasing profitability and increasing the number of unprofitable enterprises. However, despite the fact that costs are rising and the overall deficit in market demand is declining, prices are becoming higher.

The level of development of the meat processing industry of the food industry characterizes the degree of food security of Ukraine and affects the health and efficiency of the population [4]. In addition, it can be considered as a basis for strengthening the position of our country in foreign markets.

As mentioned above, the supply of raw materials to enterprises is an acute problem for the meat

processing industry of Ukraine. Although the use of imported products helps keeping the price down and significantly expands the range, the state policy in the field of agriculture is aimed at protecting the domestic market from negligent competition and creating conditions for the development of the livestock industry.

Unfortunately, today the state of the livestock industry is not able to fully meet all the needs of processors. All categories of farms have outdated material and technical base, low degree of concentration and specialization of production, reduction of livestock, etc.

This state of the meat processing industry requires significant innovations and mutually beneficial ties. To improve the efficiency of this industry, first of all, it is necessary to improve the raw material base, expand sales channels, and modernize the technological base, etc.

The intensification of innovation processes is a very important factor in economic development and should affect the manufacturing sector. For most domestic enterprises, the processes of improving financial and economic performance are closely linked with the introduction of new technologies and improved technological processes that would reduce the cost of production. But it should not just be a quality product, but one that is needed by consumers and meets their needs [17].

The trend of healthy eating in recent years has become very popular. Regardless of age and income level, customers want to see organic and healthy products on the shelves to improve and maintain their health. Today, this question is relevant not only for the consumer but also for the manufacturer, how to make the product better by reducing its cost. In the meat processing industry, new types of products with improved recipes are constantly introduced to meet the ever-growing needs of consumers.

The innovative policy of enterprises is aimed at the development, creation and introduction into the production process of sausage products of various types, using new and improved technologies.

Sausages are cooked meat sausages. The shape of the sausage resembles the miniature shape of a cooked sausage. A promising direction is to improve the technology of cooked sausages, because due to the excellent taste, ease of preparation and the ability to combine with any side dish, these products are in great demand in the domestic product market. One way to solve this problem is to improve cooked sausage with the addition of non-traditional raw materials [18].

At the meat processing plant, improvement the recipe of boiled sausage with delicate red caviar and nori seaweed, adding spelled flour and mushrooms as substitutes is suggested. Rejecting red caviar, sugar and nori seaweed, this implementation will allow increasing the content of micro- and macro-elements and dietary fiber in the “Zhyvilnaya sausage” and make its production cheaper.

Scientifically substantiated and experimentally confirmed expediency of using high-quality substitutes of a small percentage of meat raw materials in the recipe of combined cooked sausage products. It is established that raw materials, such as spelled flour, red caviar, mushrooms, have a high content of protein, vitamins, micro- and macronutrients, which will improve the nutritional and energy value of this product [19]. With the right ratio of this input raw material improves organoleptic characteristics, physic-chemical and functional-technological. Therefore, the proposed product can be considered high quality and safe.

Important for economic efficiency is the cost of production, which directly affects the level of

profitability of the enterprise. In addition, the cost is part of the cost of production and is the basis of pricing. The calculation of changes in current costs is carried out in accordance with the “Standard instructions for planning, accounting and calculation of the unit cost of production at the enterprises of the industry of all forms of industry”.

The analysis of the cost of the offered recipes of production at comparison of control samples with use of a compounding of the enterprise and experimental in which raw materials are partially replaced or norms of its expenses change, is carried out on the basis of the data given below.

As a result of laboratory studies, it was found that in general the change in the formulation did not significantly affect the production process, having changed the colour of the minced meat from pale yellow to pale grey. The taste of mushrooms is not expressed. There is a slight fresh smell of salt; no other foreign odours are detected.

At the same time, the change in the recipe of sausages had a positive effect on the cost of raw materials, which was reduced by almost three times (by 15,378.49 UAH). This was mostly due to the rejection of expensive ingredients such as caviar and nori. Sugar, sodium nitrite and water were also removed from the recipe. Instead, spelled flour and champignon mushrooms were added to compensate for the missing caviar. However, this replacement forced an increase in the concentration of chicken fillet and sunflower oil by 7% each.

Table 2. Production costs of 100 kg “Zhyvilnaya sausage” under the article “Raw materials and basic materials”

Expense items	Price, UAH/kg	Control		Experiment	
		Norm, kg	Expenses, UAH	Norm, kg	Expenses, UAH
Chicken fillet	94	48.3	4540,2	51.92	4880,48
Sunflower oil	57.6	28.0	1612,8	30.10	1733,76
Red caviar	2700	6.5	17550	–	–
Cow's milk powder	108	5.0	540	3.0	324
Spelled hydrated	65	–	–	10.0	650
Champignon mushrooms	38	–	–	2.6	98.8
Water/ice	6	9,545	57.27	–	–
Sodium nitrite	45	0.005	0.23	–	–
Sea salt	17	1.8	30.6	2.0	34
Sugar	30	0.2	6	–	–
Nutmeg extract	2122,08	0.1	212.21	0.1167	247.65
Pepper extract	450	0.1	45	0.1167	52.52
Allspice extract	318	0.1	31.8	0.1167	37.11
Nori	1210	0.35	423.5	–	–
Total	x	100	23436,81	100	8058,32

Source: authors' calculations

Thus, changing the recipe does not impair the quality and does not affect the volume of production. The colour of the minced meat changed only slightly, from pale yellow to pale grey, and a slight porosity appeared. Foreign odours and taste are absent. The cost of raw materials has almost tripled.

The technological process for the manufacture of both samples is the same, so the calculation of the following cost items is presented for all at once.

In the following Table 3, the calculation of auxiliary materials for the production of 100 kg of product.

Table 3. Costs of auxiliary materials for the production of 100 kg of products

Cost item	Price, UAH/unit	Norm	Expenses, UAH
Shell is artificial, m	12	200	2400
Boxes are standard (60x40x20), pcs	90	6	540
Label, pcs	0.5	334	167
Vacuum packaging, pcs	0,9	334	300.6
Total	x	x	3407,6

Source: authors' calculations

Thus, given the fact that the volume of each type of sausage is the same, respectively, the cost of materials will be the same as well. Namely, for packing, an artificial shell for each sausage separately (200 m per 100 kg), a vacuum package with a label

(334 pieces) and boxes measuring 60 x 40 x 20 cm (6 pieces) are needed. In general, material costs per 100 kg of products amount to 3,407.6 UAH.

Table 4 shows the calculation of energy costs similar to the material.

Table 4. Calculation of the cost of energy costs for the production of 100 kg of product

Cost item	Price, UAH/unit	Norm	Expenses, UAH
Water, m ³	23.6	1.6	37.76
Pair, MJ	36	0.5	18
Cold, J.	4.32	43,6	188.35
Gas, m ³	6.95	1.7	11.82
Electricity, kW	1,68	14.9	25.03
Total	x	x	280.96

Source: authors' calculations

Thus, according to the calculations, the total energy costs for the production of 100 kg of products amounted to 280.96 UAH.

Using the previous data, it is possible to analyze the full production cost of 100 kg of products, which is shown in Table 5.

Table 5. Production costs and cost structure of 100 kg of products, UAH

Cost item	Control	Experiment
Raw	23436,81	8058,32
Materials	3407,6	3407,6
Fuel and energy	280,96	280,96
Salary	34,26	34,26
Deductions for social events	7,54	7,54
Total	26967,17	11788,68

Source: authors' calculations

The largest share in the cost structure is occupied by raw materials. Its highest figure – 23,436.81 UAH – belongs to the control sample “Zhyvilnaya sausage”. The lowest cost of raw materials in the prototype of these products comprises 8058.32 UAH. This has been achieved by replacing some ingredients with cheaper ones. All other costs

remain the same, as the technology for the production of each individual sample has not changed.

In general, it should be noted that the reduction of the cost level makes it possible to increase sales profit, which is extremely important for the enterprise. Therefore, it is possible to conclude that the proposed changes in the recipe are cost-effective and

efficient, and do not significantly affect the quality and taste of these products.

Cost reduction occurs as a result of changes in the organization and development of specialization of production; improving the management staff and reducing costs; improving the use of fixed assets and logistics; reduction of transport costs and other related factors that increase the level of organization of production activities.

Provided that the use of fixed assets is improved, the cost level is reduced by increasing the reliability and durability of the equipment; centralization and use of industrial methods of repair, improvement of the system of planned and preventive repairs; maintenance and operation of fixed assets.

The improvement of material and technical supply and use of material resources is reflected in the reduction of raw material costs, the reduction of their cost price due to replacement with cheaper

ingredients, and the reduction of procurement and storage costs. Transportation costs are reduced due to the reduction of expenses for the supply of raw materials and transportation of finished products.

The economic motivation for the production of meat products is to increase profits and increase profitability, which in turn ensures a stable financial condition and functionality of the enterprise. The efficiency of production is formed by the volume of sales, cost and selling price of the improved product, which is a component of profit. The growth of profitable sales directly affects the proportional growth of profits. Obtaining income and profit is possible by minimizing labour costs and funds in the production of a unit of goods and is determined by the ratio of results to the costs of production means and live labour. An important factor in the efficiency of the production process is the level of profitability (Table 6).

Table 6. Efficiency of production of “Zhyvlnaya sausage”

Indicator	Control	Experiment
The cost of 100 kg, UAH	26967,17	11788,68
Sales price 100 kg, UAH	56040	56040
Profit per 100 kg, UAH	29072,83	44251,32
Profitability level, %	107.81	375.37

Source: authors' calculations

The calculation of economic efficiency shows that the production of sausages according to the classical and proposed technologies is profitable. The profitability of products is especially positively affected by the change in cost in the prototypes, which allowed increasing profitability by more than 3 times.

An important component of any market relationship is competition, which is an effective way to coordinate the actions of market participants. In general, the term “competition” means the ability to achieve the greatest social and economic benefits. It is a means of productive use of the resource potential of the enterprise for the manufacture and sale of its own products cheaper, better and faster than others.

To determine the competitiveness of the product it is necessary to know the specific needs and requirements of potential consumers; dynamics and size of demand for this product; estimated market price for products; product features of competitors; expected level of competition; payback period.

There are four main levels of competitiveness:

- the first level is those who care only about the manufacture of goods, and do not pay attention to customers;

- the second level – they want the products to fully meet the requirements and standards set by competitors;

- the third level – those who ignore the standards of competitors, while themselves become the founders of the criterion in the industry;

- the fourth level – here success is provided thanks to management, instead of production. Thus,

the company fully becomes the founder of the criteria in the industry.

The most commonly used methods of determining competitiveness are:

- based on the theory of the international division of labour. With their help they form comparative advantages of the company, which would provide lower costs than competitors;

- based on the theory of effective competition, on structural and functional approaches;

- methods based on the dependence of competitiveness on product quality or price. It is implied that the better the quality and the lower the price, the greater its competitiveness;

- methods based on A. Marshall's theory of equilibrium. In this case, the criterion of competitiveness is the availability of means of production that can be used with greater than competitors, productivity;

- the method of integrated assessment, which is based on two indicators: the efficiency of production activities and the degree of satisfaction of customer needs.

Entrepreneurs have the right to determine the prices of their goods, which is what led to price competition. Price has always been and will be one of the main levers of competition in the meat market, which provides suitable conditions for its implementation and helps to control the results of production activities.

The pricing process has several features, namely: exceeding the level of supply over demand; high costs due to imperfections and obsolescence of

technologies; lack of state support and measures to stimulate the population; high cost of production; low consumer incomes and more. Under current market conditions, the price competitiveness of industrial enterprises provides an opportunity to maintain and strengthen its position. However, when reducing prices to expand the market, manufacturers must take into account the following factors:

- the reduction in prices should not be too great, because it can provoke the opposite situation, in which consumers will not buy these products;
- reducing the price level is a temporary advantage,

because such a measure can be copied by others. In this way, they reduce the opportunities to increase sales. This situation most often leads to “price wars”, but they occur when the number of producers of the same product is small;

– in terms of price competitiveness, the winners are those producers whose products have a high level of price competitiveness and in which there is a possibility to reduce their price, while ensuring break-even production.

The following table shows the calculation of the price competitiveness of products.

Table 7. Price competitiveness of certain types of products

Indicator	Control	Experiment
Price 100 kg, UAH	56040	56040
Cost of 100 kg, UAH	26967,17	11788,68
Price competitiveness, %	51.88	78.96

Source: authors' calculations

According to the calculations, the experimental sample of sausages has the highest price competitiveness – 78.96%. This means that it is economically more profitable to sell products according to an updated recipe, which has a lower cost.

In general, the highest level of price competitiveness are those companies that have the opportunity to sell their products at prices that are lower than the minimum prices of competitors, while making a profit. The minimum price is determined by the cost of production of a unit of goods.

If the actual selling price is less than the minimum, the company will suffer a loss, and if bigger, it will make a profit. Thus, the lower the cost of goods, the lower its minimum price, respectively, compared to the minimum price of enterprises in which the cost of production will be higher, and vice versa.

To increase the level of price competitiveness, the company should:

- update the recipe, replacing some ingredients with cheaper ones and thus reduce the cost of production;
- change the manufacturing technology, quality control system, packaging, storage, transportation, etc.;
- change the selling price of goods, as well as prices for maintenance and repair of equipment;
- change the system and the volume of supply and costs;
- change the structure and size of investments in production and sales;
- improve imports.

An indicator of price competitiveness, which forms a competitive property, is the ratio of prices set by the company with market and competitors' prices. For a comprehensive assessment of manufacturing enterprises, there is an indicator that characterizes the share of profits in total sales at a price lower than competitors.

Achieving the maximum volume of sales is possible under the conditions of establishing an

equilibrium price. This process requires taking into account the factors of market demand and the corresponding supply.

In general, the formation of price competitiveness should include the following measures of pricing policy: price forecasting; improvement of production technologies; elaboration of price strategies; cooperation with exporters; market research.

► Conclusions

Thus, the development of multifaceted processes is observed in the domestic meat market. The negative side is a decrease in the level of general production, monopolization of various components of the market structure, accumulation of significant amounts of capital in the sphere of circulation, etc.

As a result of destabilizing economic processes, animal husbandry has become unprofitable or completely unprofitable, unattractive for entrepreneurs and producers. The development of animal husbandry in Ukraine is hindered by the lack of stability and state support for agricultural producers, unpredictable price policy, undeveloped export potential and, as a result, the absence of sales markets. The existing level of competitiveness of enterprises of the meat sub-complex in the regions of Ukraine is insufficient, and the volume of domestic production of meat and meat products does not fully satisfy the needs of consumers. The organizational structure of the meat industry is formed mainly by small and medium-sized enterprises according to the subject division of the production of finished products, in particular: meat, sausages, canned goods, medicines, technical products, etc.

It was proven that the priority task of meat industry enterprises was the efficiency of their functioning and development processes. It was investigated that specialists of meat processing enterprises were constantly engaged in the search and development of such recipes of cooked sausage products,

when consuming which the deficit of important functional ingredients was somewhat reduced. At the same time, great attention is paid to the combination of components of the classic recipe and biologically active additives of plant origin. Thus, the proposed ways of reducing the price of meat products by changing the recipe of products by abandoning expensive ingredients indicate the possibility of their application at the micro level. The production of these products will allow expanding the domestic assortment of functional products. Such sausage products meet modern requirements for food products and allow us to characterize them as products with fundamentally new functional properties.

Increasing the production of high-quality, ecologically and sanitary-epidemiologically safe food products are the main prospective direction of the development of the meat industry and the appropriate level of competitiveness of meat processing enterprises. Solving these issues is a complex task that requires consistent, clear, purposeful and effective

cooperation of all subsystems of the enterprise. The sources and reserves of achieving high competitiveness are laid in the internal environment of each enterprise in the improvement of production technologies and recipes of combined types of cooked sausages with a high content of minerals, protein and vitamins and the creation of nutritionally balanced products using vegetable and animal raw materials.

The implementation of environmental factors also allows increasing the efficiency of the enterprise and influencing the level of its competitiveness. According to the results obtained, increasing the competitiveness of meat processing enterprises of Ukraine in today's difficult conditions is possible thanks to the search for new resources of irreplaceable food components, the use of non-traditional types of raw materials, the creation of new progressive technologies to increase the nutritional value of the product, which improves organoleptic indicators, increases the shelf life of finished products and reduces its cost.

►References

- [1] Borshchenko, V., Lavryniuk, O., Farafonov, S., Kucher, D., & Daniluk, V. (2020). Feed behavior of breed nutrition and forecasting consumption of animal feeding in animal grazing organization. *Scientific Horizons*, 1(86), 105-114. doi: 10.33249/2663-2144-2020-86-01-105-114.
- [2] Sedikova, I. (2015). The current state and management system of enterprises of the meat product sub-complex. *Scientific Bulletin of the Kherson State University. Series: Economic Sciences*, 15(3), 109-113.
- [3] Lavruk, O. (2018). The revival of animal husbandry and its role in the development of agricultural enterprises. *Agrosvit*, 17, 36-41.
- [4] Ursachi, C., Perta-Crisan, S., & Munteanu, F. (2020). Strategies to improve meat products' quality. *Food*, 9, article number 1883. doi: 10.3390/foods9121883.
- [5] Stepasyk, L., Dramaretska, K., Titenko, Z., & Babiak, N. (2020). The competitive environment diagnostics in the animal husbandry products market. *International Journal of Advanced Science and Technology*, 29(8s), 2551-2558.
- [6] Svnynous, I., Hura, A., & Mykytiuk, D. (2013). Economic aspects of livestock production in Ukraine. *AIC Economics and Management*, 11, 29-33.
- [7] Mesel-Veselyak, V. (2016). Strategic directions of development of agrarian sector of economy of Ukraine. *Ekonomika APK*, 23(6), 37-49.
- [8] Heigermoser, M., & Glauben, T. (2020). COVID-19, the oil price slump and food security in low-income countries. *IAMO Policy Brief*, 37. Retrieved from https://www.iamo.de/fileadmin/documents/IAMOPolicyBrief37_en.pdf.
- [9] Ibatulin, M., Varchenko, O., Svnynous, I., Klymchuk, O., Drahan, O., & Herasymenko, I. (2019). Factors of ensuring the competitiveness of Ukraine's pig breeding production in external markets. *Agricultural Science and Practice*, 6(2), 29-46. doi 10.15407/agrisp6.02.029.
- [10] DSTU 31499-2012 "Canned Sausage Meat. Specifications". (2014). Retrieved from <https://files.stroyinf.ru/Data2/1/4293785/4293785623.pdf>
- [11] DSTU 26671-85 "Fruit and vegetable products, canned meat and meat-and vegetable products. Preparation of samples for laboratory analyses". (2010). Retrieved from <https://files.stroyinf.ru/Data2/1/4294827/4294827763.pdf>.
- [12] Cherednichenko, O. (2017). Economic aspects of production and consumption of meat and meat products. *Agricultural and Resource Economics: International Scientific E-Journal*, 3(3), 130-144.
- [13] Cherednichenko, O., & Bal-Prylypko, L. (2020). Rationale and economic feasibility of improving the technology of long-term storage of meat products. *IOP Conference Series: Earth and Environmental Science*, 548(2), article number 022053.
- [14] The official site of Food and Agriculture Organization of the United Nations (FAO). (n.d.). Retrieved from http://www.fao.org/index_en.htm.
- [15] The official site of State Statistics Service of Ukraine. (n.d.). Retrieved from <http://www.ukrstat.gov.ua>.
- [16] Pozharchuk, Yu. (2013). Raw material base as a factor in ensuring the competitiveness of meat processing enterprises of Ukraine. *Economics of the Food Industry*, 17(1), 32-34
- [17] Cherednichenko, O., Bal-Prylypko, L., Paska, M., & Nikolaenko, M. (2021). Expediency of creation of technology of production of meat products of long term of storage of the combined structure. *IOP Conference Series: Earth and Environmental Science*, 723, article number 032086.
- [18] Usatenko, N., Kalashnik, M., Dobroskok, S., & Verbitskyi, S. (2019). Prerequisites to improve the safety of smoked foodstuffs. *Scientific Horizons*, 6(79), 29-35. doi: 10.33249/2663-2144-2019-79-6-29-35.

- [19] Bal-Prylypko, L.V., Cherednichenko, O.O., Slobodyaniuk, N.M., Leonova, B.I., & Ryabovol, M.V. (2020). *Scientific foundations and economic feasibility of creating a complex of technologies for the production of meat products with a long shelf life*. Kyiv: National University of Life and Environmental Sciences of Ukraine.
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Тенденції розвитку м'ясопереробної промисловості України та практичні підходи до оптимізації рецептури ковбасних виробів

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► **Анотація.** Сьогодні Україна виконує складне геополітичне завдання та повинна вистояти, щоб стати гарантом не лише військової, а й продовольчої безпеки. Особливого значення набуває підвищення ефективності функціонування м'ясопродуктового підкомплексу, як однієї зі складових даного завдання. Метою статті є обґрунтування економічних аспектів підвищення ефективності функціонування м'ясопродуктового підкомплексу України внаслідок удосконалення рецептури ковбасних виробів з метою зниження їхньої собівартості. В статті висвітлюються проблеми сучасного стану м'ясної галузі України, передумови та основні причини виникнення даної ситуації. Наведені статистичні дані про тенденції розвитку м'ясної промисловості та доцільність зменшення витрат виробництва внаслідок удосконалення рецептур. Дослідження проводилось на основі використання загальнонаукових методів і прийомів: логічного та якісного аналізу та синтезу, монографічного методу, системно-структурного аналізу, причинно-наслідкового методу, експериментального методу, економіко-статистичного методу, розрахунково-конструктивного методу й методу логічного узагальнення. Результати дослідження в вигляді практичних рекомендацій щодо зниження собівартості ковбасних виробів унаслідок зміни норм витрат і вдосконалення рецептури продукції дозволяють підвищити економічну ефективність виробництва м'ясної продукції. Наукова новизна одержаних результатів полягає в розробленні практичних підходів до вивчення та аналізу динамічних процесів у м'ясопродуктовому підкомплексі на основі політики стимулювання попиту на конкурентоспроможну продукцію як на внутрішньому, так і на зовнішньому ринках. З метою здешевлення м'ясних виробів рецептура продукції була змінена за рахунок відмови від дорогих інгредієнтів. У статті поглиблені практичні підходи щодо вдосконалення рецептури ковбасних виробів, здійснена оцінка оновленої їхньої рецептури задля зменшення собівартості продукції та підвищення її ефективності, що закладає основу для подальших досліджень щодо інших видів продукції

► **Ключові слова:** виробництво, споживання, рецептура, якість, собівартість, ковбасні вироби
