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Analysis of the market of meat products in Ukraine

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Abstract. Meat and meat products are among the main products of the human diet, which contain the essential nutrients, biological, macro and microelements that are important for the full functioning of the human body. Due to the significant environmental impact associated with industrial meat production, combined with the ever-growing world population, it is important to investigate the current state and production of the meat industry. The purpose of the study was to determine the volumes and possibilities of production of certain types of meat products in Ukraine, their market share, prospects for production in the future, and the ability to provide food industry enterprises with raw materials for the production of new food products. The work was carried out by analysing scientific, regulatory and technical literature, statistical evaluation of data, and comparing the results obtained with the findings of other scientists. The analysis of the industry indicates the decline of certain areas in animal husbandry, in particular, cattle breeding and the production of meat, meat products from beef and veal; a decrease in the number of farm animals, namely by 23% of bovine cattle, 6.9% of pigs, and 2.4% of poultry. During the analysed period, poultry meat production increased by 17%, while the number of business entities increased by 25%. At the same time, beef and veal production decreased by 27.8%, while pork production increased by 33%. Based on the results obtained, it is possible to continuously provide processing enterprises with meat raw materials, namely, chicken meat for the production of meat products, and it is also relevant to introduce resource-saving technologies for obtaining a product with less weight loss and waste during processing. The study results can be used by enterprises when planning the release of products to the market, developing new recipes, improving existing production technologies, and understanding trends and volumes of meat and meat products on the Ukrainian market

Keywords: poultry processing; producer; food product; production technology; food security; animal husbandry

Introduction

According to the United Nations Population Fund (2023), the world's population was 8 billion in 2022. Due to the large number of people and the constant increase in population, there is a question of food supply, particularly meat and meat products. A complete diet directly depends on the consumption of animal protein. The production of meat and products from it also depends on the ability to produce and prepare animal feed, the number of farms, the allocation of land resources for raising livestock, etc. Given this and the possible food insecurity due to Russian aggression, the study of production volumes and trends in the development of the meat industry market in Ukraine is relevant.

A. Teixeira & S. Rodriguez (2021) found that the potential consumer is poorly informed about the benefits of meat products, in particular, health products that are presented on the market. The consumer does not always know how meat is produced and processed, does not pay attention to the physical and chemical composition or nutritional value, and only uses sensory assessment. As noted in the paper, the potential market for healthy meat products can only offer benefits for both healthcare and the meat industry if consumers consciously accept these products.

During the study of broiler meat production in the world, it was found that the specific share

of such meat from the total mass of chicken is 87-90%, and the production of chicken meat, in general, is developing faster than the world's population is increasing (Vissers *et al.*, 2019). The United States of America (USA) occupies a leading position in the world among the largest producers of chicken meat, while Europe, in order to improve its indicators, must optimise existing capacities and increase production by upgrading equipment and improving existing technologies, because it has used the existing reserve of land resources to build new production facilities (Sakhatskyi & Abdullaieva, 2014).

There is a relationship between livestock and food industries. Thus, the first one will experience some, and in some cases significant, impact due to the reduction of livestock, farms, and other enterprises for keeping animals. At the same time, processing enterprises and producers of finished products are increasing their capacity by obtaining raw materials through the slaughter of animals as a result of farm liquidations. Processors import a significant amount of raw materials, which negatively affects the economic efficiency of domestic producers. The lack of subsidies and other forms of state support also negatively affects producers in the meat industry. N.H. Kopytets & V.M. Voloshyn (2020) note that during changes and transformations in animal husbandry in Ukraine, processing enterprises should respond in time and anticipate the negative consequences with preventive measures. According to the researchers, poultry meat is the most profitable in Ukraine due to the constant investment in this industry and rapid payback of funds, an increase in production areas, and the demand of the country's population.

Researchers from India (Srutee *et al.*, 2022) examined the issues of farm animal meat production technologies and the challenges that await the world's population from consumption

in the future. According to the authors, due to the growing demand for meat among the world's population, it is possible that in the future it will not be possible to meet the demand for meat in kind. With this in mind, they were looking for alternative sources to replace the proteins found in meat. One proposal was to replace traditional animal meat with pure meat. This is an opportunity to obtain meat from animals without slaughter – by isolating the animal's cells and growing them in controlled growth conditions and environments that mimic the state *in vivo*. The meat and meat products produced using this technology are already on the market and have been sold for the last 5 years. Although consumer reviews are mixed about such a product and it is still necessary to consider a number of factors for the possibility of full-fledged production, namely, the nutritional properties, taste, shape, and structure of meat.

Considering the possibilities of meat production and food manufacturing, the population's demand for certain types of meat and the export opportunities of Ukraine, the question of rational processing of meat for maximum benefit and economic effect arises. In the food industry, various methods of preserving raw materials and food products, including meat, are used to extend the shelf life. One of such methods is drying. According to I. Pohozykh *et al.* (2012), it is best to dry high-grade veal with a fat content of 1.2%, turkey meat, and those types of meat that are characterised by a low content of adipose tissue. These products have higher nutritional and biological value and do not require large storage areas. Researchers also report that dried products have some functional and technological properties and can be used in the diets of geologists, athletes, and military personnel.

L.V. Molokanova and O.O. Oreshyna (2015) investigated the range of dried and cured

products made from various types of meat, which is presented on the Ukrainian market. According to the results, as of 2015, the share of products from chicken meat was 33%, pork meat – 22%, beef – 16%, horse meat – 11%, lamb – 8%, turkey – 6%, venison – 3%, and ostrich – 1%.

For the production of dried meat, raw materials should be low in fat, with high moisture binding capacity and an optimal ratio of muscle and connective tissues. Moreover, the production of dried meat allows avoiding some labour-intensive operations, reducing the duration of the technological process, and expanding the range of finished products (Pohozhykh *et al.*, 2013). This is also one of the most promising long-term storage products.

When developing new technologies for the production of meat products, it is necessary to consider changes in sensory characteristics and nutritional value indicators. As noted by I. Gómez *et al.* (2020), to obtain high indicators of the finished product, it is necessary to use combined processing and preservation technologies. At the same time, the production of minimally processed products is relevant for consumers. Some of the most popular and useful methods of canning and production are dry ageing (maturation of meat under controlled conditions), drying (reducing the moisture content of meat to extend the shelf life), fermentation (products with average moisture content and long shelf life) (Gómez *et al.*, 2020).

The purpose of this study was to analyse and systematise the Ukrainian market for the production of meat and meat products from various raw materials to determine promising areas for processing meat raw materials for the development of new products.

Materials and Methods

The materials of the study were scientific, technical, and official statistical information, which

was analysed and synthesised using the methods of theoretical and statistical research. The study was conducted within the framework of the dissertation research “Improvement of the technology for the production of meat delicacies using bee products” on the basis of the Faculty of food technologies and quality management of the agricultural products of the National University of Life and Environmental Sciences of Ukraine during October 2022-January 2023.

General methods and techniques were used, namely, abstract and logical methods: induction and deduction, analysis, synthesis, analogy, and comparison. Scientific and technical literature from the Scopus, Web of Science and Google Scholar databases was reviewed; regulatory and technical information from relevant institutions, organisations, and departments, in particular, the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Economy of Ukraine, the National Academy of Agrarian Sciences (NAAS) of Ukraine, the Institute of Food Resources of the NAAS of Ukraine, the State statistics service of Ukraine, etc. Abstract and logical methods were used to process theoretical information and analyse the actual situation regarding the general state of the meat and meat products market in Ukraine, and form tasks and conclusions of the study.

Keywords for the search of necessary information and data were: industrial production, food production, chicken meat, beef, pork, meat market in Ukraine, meat production in the world, export and import of meat, food industry enterprises of Ukraine, production volume, breeding of farm animals.

The data was received upon request from the State Statistics Service of Ukraine (2023). Statistical evaluation and comparison of the obtained data were processed using the built-in MS Excel statistical function package and are presented in Figures 1-7.

Data collection and analysis were applied to the production and processing of meat industry products, namely: the production of meat and meat products, including poultry meat and products made from it. Methods of analysis, synthesis, and comparison were used to investigate wholesale and retail trade in meat and meat products in Ukraine, including in specialised stores for the period 2014-2021. Data assessment and analysis were applied to information on the number of employees involved in the production of food products (including beverages and tobacco products) on a monthly basis over the past five years. The comparison was used to examine the level of production of chicken, pork, beef, and

veal in 2017, 2019-2021 in Ukraine. Methods of analogy, comparison, analysis, and synthesis were used to determine the number of existing business entities for the production of food products: meat (including poultry) and meat products in 2014-2020 in Ukraine.

Results

Breeding of agricultural animals by species

The production of meat and meat products directly depends on the number of animals kept in farms, industrial enterprises, or households. Figure 1 shows the number of farm animals (thousand units) that were kept by Ukrainian enterprises, namely cattle, in particular cows and pigs, for the period 2018.

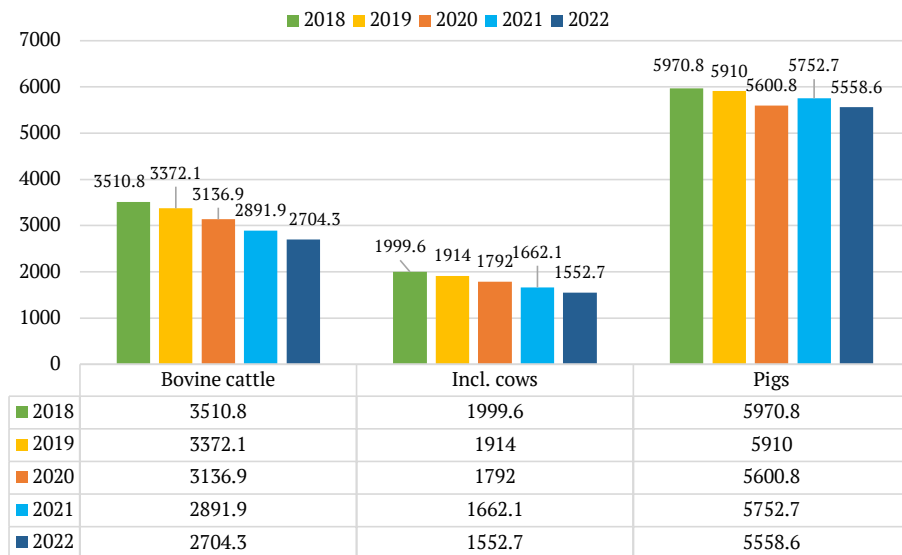


Figure 1. Number of farm animals, thousand units

Source: State statistics service of Ukraine (2023)

As can be seen from Figure 1, the situation with the number of cattle, including cows, over the past five years is complex and the number of animals is systematically decreasing. Since 2018, the number of cattle has decreased by 23%, and the number of cows has decreased by

22%. The reason for this phenomenon is the unprofitable breeding and keeping of animals, high-cost feed, and the high cost of veterinary drugs in this area. As a result, the price of meat which does not find much demand among buyers also increases. Regarding the situation with

the number of pigs, from 2018 to 2022, the number of pigs at Ukrainian enterprises decreased by 6.9%. Although there was a slight improvement in 2021, the number of pigs increased by 2.7% compared to 2020. Pork production in Ukraine is in second place among the production of various types of meat, although there is also a downward trend in the number of livestock. According to data and observations, this is conditioned by the unwillingness of

producers to engage in the cultivation and breeding of animals, periodic disease strains that require the destruction of all pigs, and high prices for maintenance and feeding.

Figure 2 shows the number of animal units of domestic poultry for the analysed period – 2018-2022. The number of poultry at the end of each study year is determined and presented as the largest and smallest number of birds during the year.

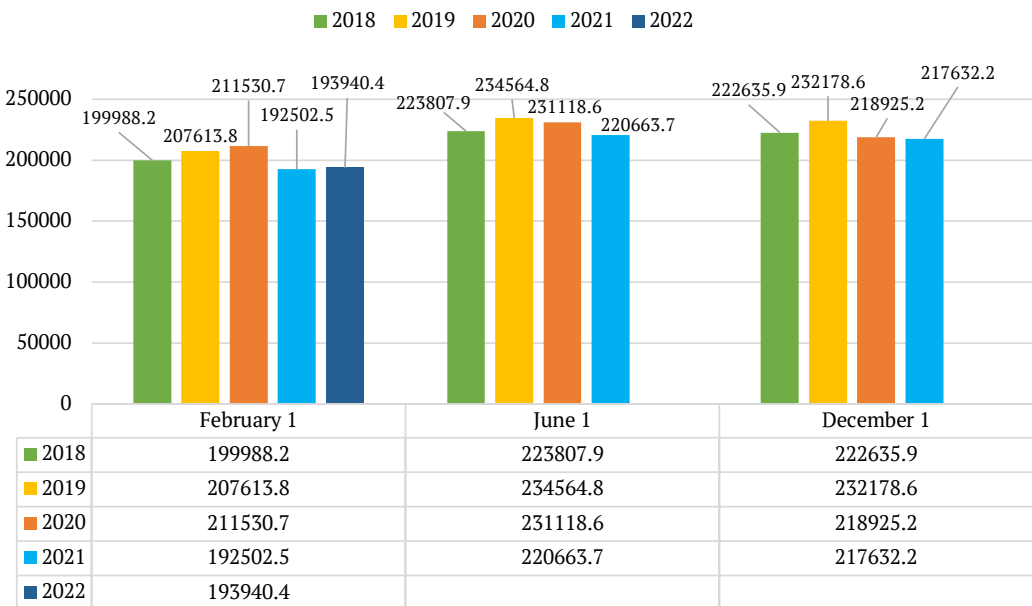


Figure 2. Number of poultry, thousand units

Source: State statistics service of Ukraine (2023)

Based on the data obtained from Figure 2, the largest number of poultry was kept in June, and the smallest – in February. Analysing the number of animals units at the end of the year (December), from 2018 to 2021, a decrease in the number of poultry was recorded by 5,003.7 thousand units (or 2.24%). As of 1 June 2019, the number of cows was 10,756.9 thousand more (4.8%), and in 2020 – by 7,310.7 thousand more (3.3%) compared to 1 June 2018. The State

statistics service of Ukraine has not yet released data since March 2022, but it is expected to dramatically reduce the number of poultry due to the full-scale invasion and war unleashed by the Russian Federation against Ukraine and the destruction of some of the largest poultry farms in Ukraine, where 4.4 million animals died (In Donetsk region..., 2022; Rising prices and a loss of 12 billion..., 2022). Nevertheless, considering the indicators of previous years and prospects

for the development and recovery of the poultry industry, it can be considered as promising and necessary for the Ukrainian market.

Production and sales volumes of meat products

When analysing the meat industry, it was important to consider the number of operating

business entities in Ukraine (Fig. 3) by categories: meat production, meat products production, and poultry meat production. The analysis was carried out for the period 2014-2021. It is determined in which year there were more business entities for the production of meat and meat products and how much the indicators have changed as of 2021.

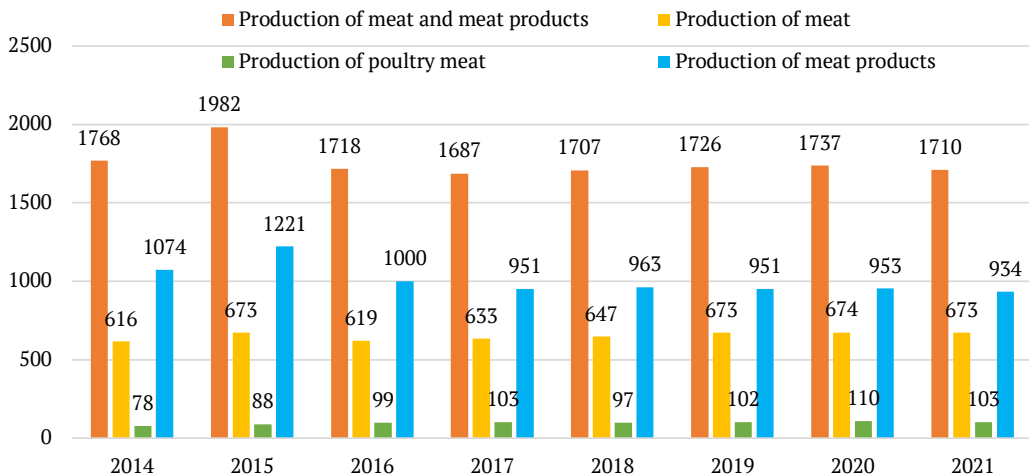


Figure 3. Number of operating business entities in 2010-2021

Source: State statistics service of Ukraine (2023)

Figure 3 shows that the largest number of business entities engaged in the production of meat and meat products was in 2015, and in the production of meat in 2020, with a difference of 1 entity compared to 2015, 2019, and 2021, in the production of meat products in 2015, and in the production of poultry meat in 2020. In general, during the analysed period, the difference by year was insignificant, so the number of business entities for the production of meat and meat products in comparison with 2014 decreased by 58 (3.3%) and by 140 (13%) for the production of meat products, but increased by 25 (32%) for the production of poultry meat and by 57 (9.3%) for production of meat. Given the dynamics of creating new business

entities, it is obvious that the production of meat and poultry meat is promising for profit.

The economy of each country depends on many factors, including the production of industrial products. The country's food security also depends on the production of basic necessities and food products in general. Ukraine has always occupied one of the leading places in the world in providing the population with agricultural and food products, so it plays an indirect role in global food security.

An analysis and comparison of the production of industrial products by type was carried out, namely, the production of chicken and chicken meat, pork, beef, and veal (Fig. 4).

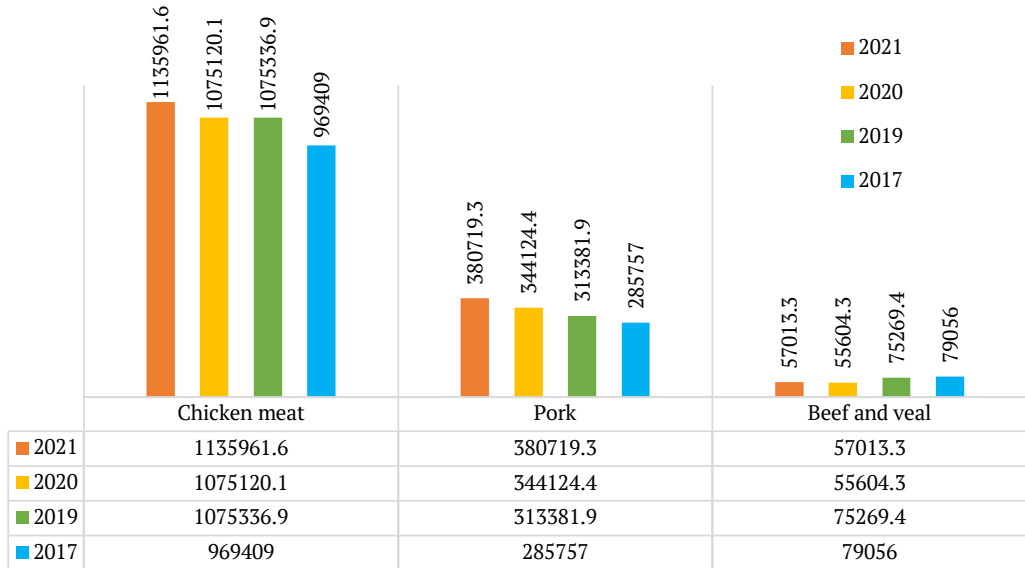


Figure 4. Production of industrial meat products by year, t

Source: State statistics service of Ukraine (2023)

A positive trend is observed in the production of chicken meat and pork, the opposite situation is observed in the production of beef and veal. Thus, during the study period (2017-2021), the production of chicken meat, namely fresh, chilled, and frozen, increased by 166,552.6 tonnes (or 17%); the production of pork (fresh, chilled, frozen, salted, in brine, dried or smoked) increased by 94,962.3 tonnes (33%); the production of beef and veal (fresh, chilled, frozen, salted, in brine, dried and smoked) has the negative indicator and their production decreased by 22,042.7 tonnes (27.8%). The correlation between beef and veal production indicators is associated with a decrease in the maintenance of cattle in farms of various capacities and forms of ownership in the livestock industry. High figures in terms of the number of poultry and chicken products produced once again confirm the prospects for choosing such raw materials when developing new products and improving existing poultry processing technologies for food needs.

The profitability of any production is always measured in monetary terms. An increase in the volume of products produced does not always lead to additional profit. Therefore, the volume of products produced by business entities in 2014-2020 per thousand UAH was studied. The same groups were chosen for comparison as in the previous times: production of meat and meat products, production of meat, production of poultry, and food production in general. The results obtained are shown in Figure 5.

Considering the data obtained, the volume of food production has been constantly growing since 2014. Thus, as of the end of 2020, compared to 2014, the volume of food products produced increased by UAH 311,538,053.4 thousand (or by 122%). However, in terms of the US dollar, the increase reaches only 23%, which indicates a high level of inflation. Regarding the production of meat and meat products, a significant increase in the volume of products produced occurred in 2017 (compared to 2016) – almost 2 times (98%). As of the end of 2020, compared

to 2014, the volume of meat and meat products produced increased by UAH 60,525,406 thousand (or 183%). Again, in terms of the US dollar, the increase reaches only 57%. A positive trend is noted in the increase in the volume of production of poultry meat in thousands of UAH. During the study period, the volume of poultry meat products produced increased by UAH 29,527,733.6 thousand (or by 253.5%). In terms of the US dollar, the increase over seven years reaches 96%, that is, 2 times. For comparison, the volume of meat production during this pe-

riod increased by UAH 16,398,630 thousand (or 286.7%), which is 115% in terms of the US dollar. But the category of meat production includes beef, veal, pork, horse meat, lamb, and goat meat, and the category of poultry meat includes chicken, turkey, and geese. Based on the results, the production and processing of poultry products, including chicken, will generate a more stable and constant income. Ultimately, the cost of production and processing of this product is lower compared to other types of meat and it will have a lower cost for consumers.

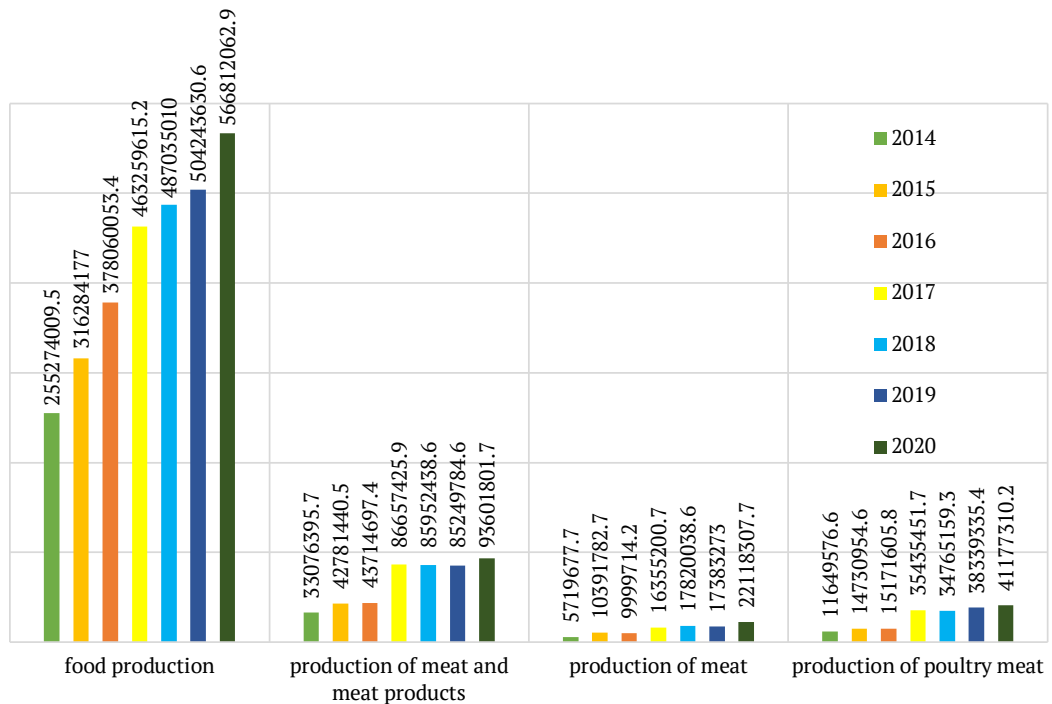


Figure 5. Volume of products produced by business entities in 2014-2020, thous. UAH

Source: State statistics service of Ukraine (2023)

Information on trade in meat and meat products produced in Ukraine was analysed and systematised. The data obtained are shown in Figure 6.

The manufactured products, namely meat and meat products, were sold through whole-

sale and retail trade in specialised enterprises. The manufactured products were sold both on the domestic market of Ukraine and were exported to different countries of the world. Retail trade in meat and meat products occupies only 7-9% of wholesale trade and is sold mainly

in branded stores of manufacturers. In accordance with the growth in production volumes,

trade is also growing, which is equivalent to thousands of UAH.

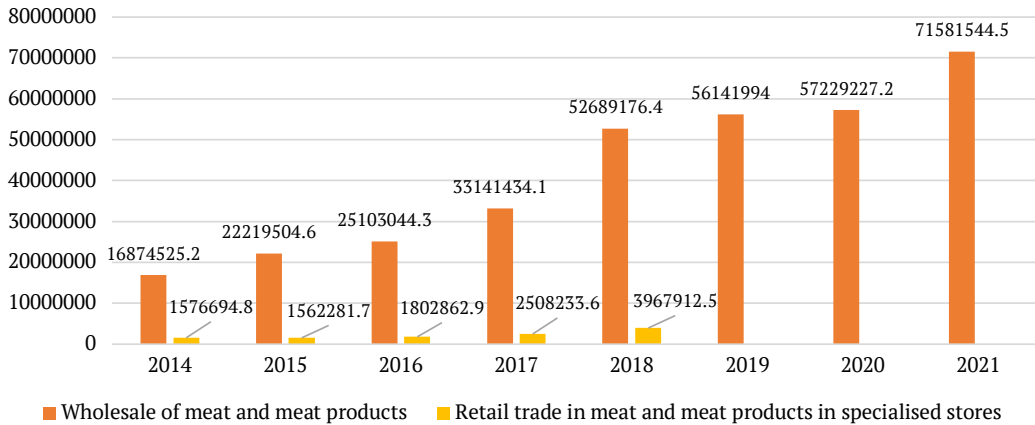


Figure 6. Trade in meat and meat products, thous. UAH

Source: State statistics service of Ukraine (2023)

Volumes of labour resources of food industry enterprises

The production of any product directly depends on the employees involved in it, so it was important to determine the number of

employees involved in the food industry. The average number of full-time employees involved in the production of food products (including beverages and tobacco products) by month is shown in Figure 7.

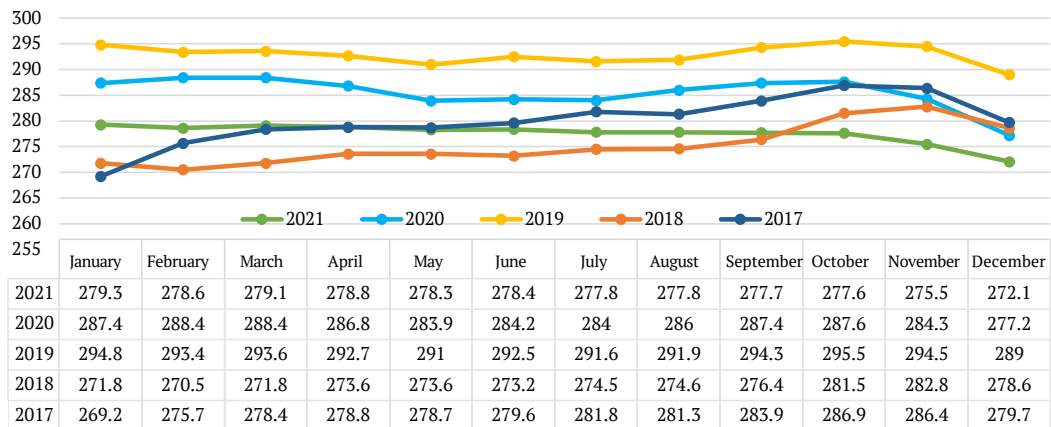


Figure 7. Average number of full-time employees involved in the production of food, beverages, and tobacco products, thous. people

Source: State statistics service of Ukraine (2023)

As can be seen from Figure 7, during each study year, there was a significant turnover of full-time employees who were involved in the production of food, beverages, and tobacco products. On average, at the beginning and end of the year, the difference between full-time employees is approximately 2-4%. The highest number of employees was recorded in March, July, and October. This is due to the performance of seasonal work, individual and specialised orders. The average number of employees by year was as follows: 2021 – 277,583 thousand people, 2020 – 285,466 thousand people, 2019 – 292.9 thousand people, 2018 – 275,242 thousand people, 2017 – 280,033 thousand people. Based on these data, there is a general trend towards a constant reduction in the number of employees (not including the figures for 2019). A number of factors contributed to the instability in providing people with jobs, including the COVID-19 pandemic and quarantine restrictions, low wages, the transition to automated production, hard physical and mental work (slaughterhouses), etc. As for the information for 2022, the State statistics service of Ukraine has not yet provided it, but a significant reduction in employees is expected due to the full-scale war of the Russian Federation against Ukraine, the closure and destruction of industry enterprises, the relocation of enterprises, including abroad, the transition to partial or fully automated production. Considering the data obtained, enterprises can anticipate various risk factors that they may encounter during their own activities: rely mainly on human labour to provide the necessary conditions for employees to minimise the flow of personnel, or develop the company's activities with a minimum number of employees, where the main work can be performed using equipment and not be dependent on providing employees.

Discussion

Analysing the research on the general situation of the state and production of the meat industry in Ukraine, it was also appropriate to consider the work of researchers who also studied such issues. Meat production is increasing, so over 50 years, the world's stocks of chickens and pigs have increased by 5 and 2.5 times, respectively. In Asia, meat consumption increased 15-fold during this period, while the population increased 2.6-fold. It is proposed to use more stable vegetable proteins in human diets in conditions where animal protein is not necessary and is of little use. This will reduce meat consumption in the future and at the same time greenhouse gas emissions, air pollution, water use, water pollution, and the incidence of major non-communicable diseases in developed countries (Poore & Nemecek, 2018; Espinosa *et al.*, 2020).

Considering the fact that meat production in Ukraine cannot fully provide the population with products, including due to its high cost, it is advisable to use animal protein substitutes to provide the body with the necessary nutrients – soybeans, beans, nuts, and dairy products. S. Grygoryev (2016) investigated the cost of poultry production in Europe, Africa, Asia, and America in comparison with Ukraine, and the impact of this indicator on competitiveness. The most expensive item in the production of poultry meat is feed costs, which in some places amount to up to 70%. Considering the cost price, the most expensive poultry meat production among the EU countries is Denmark and Italy, and the cheapest in Poland and Hungary. Among other countries, Argentina and Brazil have a lower cost of poultry production compared to Poland. Ukraine is one of the countries with the lowest cost of poultry meat production in the world.

Exports of meat and meat products from Ukraine increased after the country joined the

World Trade Organisation. However, A. Berher (2020) notes that unresolved problems in the development of meat and meat products producers are non-compliance of products with international quality and safety standards, insufficient state support for the sector, and low level of exports of some meat raw materials, in particular beef and pork.

A significant share in the consumption and export of meat in Ukraine is occupied by chicken, as well as cheap types of meat and meat products are in great demand. The largest producer of chicken meat and chicken products in Ukraine, in addition to raising chickens and producing meat, also produces frozen semi-finished meat products and frozen culinary products, which it supplies to the international market and increases exports every year (Kovinko *et al.*, 2016).

A.V. Harbar & R.L. Susol (2021) investigated the possibility of increasing the production of beef and, accordingly, beef meat products in the conditions of the south of Ukraine. They developed a technology for feeding young animals, where, subject to all the requirements and recommendations, it was possible to get a live weight of 500 kg of super-replacement stock within a year. According to the authors, Ukrainians do not have a clearly defined culture of beef consumption, especially in its natural form, and in most cases only in a deeply processed form. Moreover, due to the high cost of beef and veal, the population of Ukraine prefers poultry and pork. In addition, beef cattle breeding is only at the initial stage of its development, because the share of cattle of meat breeds in livestock enterprises is only 5% of the total number of livestock (Kozak & Hryshchenko, 2019).

Meat and meat products are essential for maintaining a healthy lifestyle and contain essential elements. In comparison with many countries of the world, where the production of cattle meat is a profitable and promising

business area, in Ukraine such production is unprofitable. Insufficient investment and subsidies from the state in the sector of keeping cattle by enterprises and producing beef and veal meat lead to catastrophic consequences that may even threaten the country's food security (Koshel, 2019). Measures to stimulate domestic pork consumption in Ukraine were investigated by S.Yu. Sokolyuk *et al.* (2022). According to the researchers, Ukrainians consume 30-40% less meat than residents of the European Commonwealth countries. The main problems that hinder the progressive functioning of the meat processing complex are the disparity in production prices and the ability of the population to buy products, the decline in production, inflationary processes, etc. For sustainable and efficient pork production in Ukraine, it is necessary to introduce economic management at enterprises. V.M. Lesyk & N.O. Kovalenko (2018) note that the main management process should consist not only of production aspects, but also of the entire activity of the enterprise. Researchers also note that an intensive approach to the development of the enterprise will contribute to a gradual increase in production capacity and increase the productivity of animals, which will provide more meat. The current state of pork production in Ukraine has been studied by I. Chernyshov and M. Levchenko (2018). According to their research, under the influence of imperfect economic conditions of production, the pig industry is in decline. The authors argue that Ukraine is on the verge of a critical border of food security due to a multiple decline in pork production and low consumption by the population. L. Stepasiuk (2019), like most researchers, when studying pork production in Ukraine, notes the urgent need for state regulation and intervention in solving the problem of the unprofitability of the industry. In addition, there are problems in providing the population

with high-quality and safe products, ensuring food security of the state and the economic efficiency of pork production. Summarising the analysed statistical data and results of other researchers, the development of pig breeding has stopped and pork production has decreased.

O. Dovgal (2020) investigated the meat and food sub-complex of the agro-industrial complex. The researcher notes that due to the import of live animals, meat raw materials and products, offal, and other products of animal processing, the need for Ukrainian industrial enterprises to form and support the development of their own raw material zones is reduced. In addition, the expansion and monopolisation of the market by agriholdings, which are mostly focused on the foreign market, pose a threat to the stability of domestic supply of meat and meat products.

According to the S.A. Sehedá (2020), in Ukraine the decline of certain livestock industries is caused by different consumption of meat and meat products by the population and non-compliance with the rational consumption rate. The main factor in the consumption of meat and meat products is the level of wages of the population. Accordingly, with the increase in income, the consumption of products increases significantly, which has a positive impact on the overall development of production. The decline in the number of livestock and the production of meat and meat products has a negative impact not only on the agricultural sector but also on the provision of affordable meat products to the population. L. Fushtei (2020) notes that it is the meat market that is strategically important and significant for ensuring the food security of the state. In Ukraine, only poultry production is actively developing among the products of the meat and food sub-complex, which occupies a predominant share. A significant share of pork, beef, and veal

production is concentrated in households. The increased production of meat and meat products is conditioned by a significant reduction in the number of cattle and pigs (Fushtei, 2019).

For many years, scientists have been trying to create meat using the laboratory method (Sharma & Kaur, 2015; Mayhall, 2019; Van Loo *et al.*, 2020), which could replace natural products from farm animals. In 2013, the world's first laboratory hamburger made from muscle cells was created. However, the developed sample could not be scaled to an industrial scale due to its high cost of USD 300,000 and the imperfection of the meat itself. The researchers developed and discussed the design of micro-carriers for skeletal muscle cell proliferation and then for meat production (Bodiou *et al.*, 2020).

One of the factors that affected global meat production, supply chain, and prices was the COVID-19 pandemic. One of the reasons for the massive rise in the price of raw materials and meat products, the researchers cite panic purchases at the beginning of the pandemic and a decrease in meat production. M. Ijaz *et al.* (2021) noted that a large number of meat processing plants began to close due to worker illness, and also due to workforce reductions, restrictions on the movement of animals within countries, and changes in local and international export market regulations. Integration between all stakeholders in the meat industry is essential to ensure the sustainability of the supply chain and avoid similar challenges in the future. According to the authors of this study, Ukraine also recorded a rise in the price of meat and meat products during the beginning of the pandemic, as well as problems in ensuring the full functioning of industry enterprises.

Researchers from around the world, in particular, the United States, England, Sweden, and Norway, have studied infectious diseases that arise from the consumption of animal meat

and the role of animal husbandry and meat production in the spread of infectious diseases (Tschofen *et al.*, 2019; Willett *et al.*, 2019). They note that raising animals and producing meat in households most often leads to infection and transmission of diseases. The researchers also described various infectious diseases that negatively affect meat production, and, accordingly, the economy of countries and the environment. Infectious diseases are one of the reasons that lead to a reduction in the production and consumption of meat and meat products. The main changes that help to control the situation and respond to any risks in a timely manner are the adoption of a number of laws of Ukraine, namely Law of Ukraine No. 771/97. "On Basic Principles and Requirements for Food Safety and Quality" (2023), Law of Ukraine No. 2498-XII. "On veterinary medicine. Law of Ukraine 2498-XII" (2023). Given the results of researchers from Ukraine and around the world, which have been analysed and discussed in this paper, as well as the results of this study, the issue of meat and meat products production and the development of the meat industry, in general, is of utmost importance. The papers by the above-mentioned researchers coincide with the data obtained in this study on the reduction of certain types of farm animals, filling the market with cheaper products, obtaining large production volumes due to the introduction of resource-saving technologies and increasing animal productivity, and monopolising the market in certain areas of the meat industry.

Conclusions

In the course of the study, the current state of meat and meat products production in Ukraine, the volume of goods produced, and the number of full-time employees for food production were analysed and evaluated. It was determined how many business entities in various spheres

of economic activity were valid on the territory of Ukraine, data on the number of farm animals at Ukrainian enterprises and how the products are sold were presented. As for the number of agricultural animals kept by Ukrainian enterprises, their number has significantly decreased in recent years. The worst situation is observed with the rearing of cattle and, accordingly, the production of beef and veal. The results obtained also coincide with the findings of a number of researchers. Thus, over the past 5 years, the number of cattle, including cows, has decreased by 23%, pigs – by 6.9%, and poultry – by 2.4%, despite the best indicators and prospects among other agricultural animals. Investigating the production of industrial products by individual types, it was found that the production of chicken and chicken meat increased by 17%, pork production increased by 33%, and beef and veal production decreased by 27.8%. In some cases, production increased due to a sharp decrease in the number of animals and sending them for processing.

The volume of manufactured products, namely food, meat and meat products, and poultry meat, measured in thousands of UAH, increased from 98% to 122% over the 2014-2020 period, and in some cases even up to 253% and 286%. However, in terms of the US dollar, these indicators range from 23-57%, 96-115%. This indicates a high level of inflation during these years. Regarding the introduction of technologies for creating meat by laboratory method in Ukraine to provide the domestic market with meat products, the authors suggest that this is impractical. And given the results of the study and the socio-economic situation of the country as a whole, it is irrational and unrealistic. It is important to establish the production of certain types of products at existing facilities, introduce the latest technologies to ensure continuous production, control the quality and safety

of products in accordance with international standards, and help at the state level to stabilise the situation in the field of animal husbandry and production of meat and meat products.

In general, the production and trade of meat and meat products in Ukraine has great potential, due to the large reserves of land resources for growing animal feed, keeping farm animals on farms, industrial enterprises or households, and the possibility of building new facilities for the production and processing of livestock products and the manufacture of new food products. It is important to prevent the ever-increasing unprofitability and the possibility of the disappearance at the industrial levels of certain areas of animal husbandry, in particular, bovine cattle and pigs; transformation of poultry production into monopolistic market ownership. Consideration of the recommendations of scientists and an effective and rational approach on the part of the state to ensuring

the proper functioning of the agro-industrial complex will have a decisive place in ensuring food security in Ukraine.

It is appropriate to conduct future studies on the properties of chicken meat, as the most common on the Ukrainian market and promising in terms of production in the future. It will also be relevant to investigate changes in the structure and properties of chicken meat due to the influence of various methods of processing raw materials. Studies on the possibility of improving production technologies through the use of combined technologies to extend the shelf life of products and their use in specialised food will be promising.

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Conflict of Interest

None.

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Анотація. М'ясо та м'ясні продукти є одними із основних продуктів раціону людини, що в своєму складі містять необхідні біологічні та поживні речовини, макро та мікроелементи, які важливі для повноцінного функціонування організму людини. Через значний вплив на навколишнє середовище, пов'язане з промисловим виробництвом м'яса у поєднанні з постійно зростаючим населенням світу, актуальним є дослідження діючого стану та виробництва м'ясної промисловості. Метою роботи було визначити обсяги та можливості виробництва окремих видів м'яса та м'ясної продукції в Україні, їхню частку на ринку, перспективи щодо виробництва в майбутньому, можливість забезпечувати підприємства харчової промисловості сировиною для виробництва нових харчових продуктів. Виконання роботи здійснювали за допомогою аналізу наукової та нормативно-технічної літератури, проведення статистичного оцінювання даних та порівняння отриманих результатів з дослідженнями інших науковців. Аналіз промисловості вказує на занепад окремих напрямів у тваринництві, зокрема вирощування ВРХ та виробництва м'яса, м'ясних продуктів з яловичини та телятини; зменшення кількості сільськогосподарських тварин, а саме на 23 %

ВРХ, 6,9 % свиней та 2,4 % свійської птиці. За аналізований період виробництво м'яса птиці зросло на 17 %, а кількість суб'єктів господарювання збільшилося на 25 %. Водночас на 27,8 % зменшилося виробництво яловичини та телятини, а виробництво свинини збільшилося на 33 %. Враховуючи отримані результати є можливість безперебійно забезпечувати переробні підприємства м'ясною сировиною, а саме курячим м'ясом для виробництва м'ясних виробів, також є актуальним впровадження ресурсозберігаючих технологій для отримання продукту з меншою втратою маси та відходами під час перероблення. Результати дослідження можна використовувати підприємствам під час планування випуску продукції на ринок, розроблення нових рецептур, удосконалення існуючих технологій виробництва, розуміння тенденцій та обсягів м'яса, та м'ясних продуктів на ринку України

Ключові слова: переробка птиці; виробник; харчовий продукт; технологія виробництва; продовольча безпека; тваринництво