



**MODERNIZATION OF RESEARCH AREA:  
NATIONAL PROSPECTS  
AND EUROPEAN PRACTICES**

Scientific monograph

Riga, Latvia  
2022

UDK 001(08)  
MO045

**Title:** Modernization of research area: national prospects and European practices

**Subtitle:** Scientific monograph

**Scientific editor and  
project director:**

Anita Jankovska

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**Publisher:** Publishing House “Baltija Publishing”, Riga, Latvia

**Available from:** <http://www.baltijapublishing.lv/omp/index.php/bp/catalog/book/234>

**Year of issue:** 2022

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Modernization of research area: national prospects and European practices: Scientific monograph. Riga, Latvia: Baltija Publishing, 2022. 712 p.

ISBN: 978-9934-26-221-0

DOI: <https://doi.org/10.30525/978-9934-26-221-0>

The scientific monograph presents the theoretical and practical aspects of the modernization of research area: national prospects and European practices. General questions of economics and enterprise management, technical sciences, technology of food and light industry, physical and mathematical sciences, geographical sciences, medical sciences, legal sciences, national security issues, pedagogical and philological sciences, and so on are considered. The publication is intended for scientists, educators, graduate and undergraduate students, as well as a general audience.

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**CURRENT TRENDS IN THE DEVELOPMENT  
OF THE MEAT PRODUCT SUBCOMPLEX OF UKRAINE  
IN THE CONTEXT OF EUROPEAN INTEGRATION**

**Liudmyla Boltovska<sup>1</sup>**

DOI: <https://doi.org/10.30525/978-9934-26-221-0-3>

**Abstract.** Among the branches of agriculture, animal husbandry itself is a source of important food products for humans: milk, meat, eggs, and for industry (food, light pharmaceutical, etc.) supplies various types of raw materials. The increase in live weight produced in animal husbandry in the agro-industrial complex of Ukraine is formed in the meat product subcomplex, which unites producers of agricultural (livestock) products, trade organizations and meat processing enterprises in the process of raising livestock and poultry, processing and selling finished products. *The subject of research* is a set of theoretical and methodological foundations for the study of current trends in the development of meat products subcomplex. *Methodology.* The research is based on general scientific and special methods of cognition of economic phenomena and processes, fundamental principles of management theory and general scientific principles of economic science. The research will be conducted on the basis of the use of general scientific methods and techniques: system-structural analysis – in the analysis of the current state of the meat products subcomplex; method of causal analysis – to identify problems in the development of enterprises of the meat subcomplex and industry; logical generalization – for the formation of conclusions and proposals. The purpose of this study is to characterize current trends in the development of meat products subcomplex of Ukraine in the context of European integration processes. *Practical meaning.* The results obtained are to solve an important scientific problem for the development of the meat subcomplex on the basis of a comprehensive system of measures. *Practical implications.* The study of current trends in the development of the meat product subcomplex has shown that the

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main direction of development should be to ensure the highest efficiency of production activities in conditions of high market demand for these products. Pig breeding and poultry farming meet this criterion, which ensures high profitability and return on investment.

### 1. Introduction

The meat product subcomplex is an important part of the economy and the main component of the country's food security. However, due to the decline of livestock, the number of livestock, except poultry, is decreasing every year, which has a negative impact not only on the norms of meat consumption by the population, but also on the economy as a whole.

Meat and meat products are one of the main foods of most segments of the population, and therefore, its production is of strategic socio-economic importance. Improving the welfare of the population and related changes in the structure of food demand determine the outpacing growth and predominance of livestock over crop production in most developed countries. Population and income growth in developing countries is also exacerbating the trend in per capita consumption of animal protein.

The domestic market of meat and meat products is becoming more dependent on imports every year.

The development of the meat product subcomplex in Ukraine requires scientifically sound actions, for the implementation of which there is an objective need to study the main trends in the development of the industry.

The issue of development and modernization of the meat product complex of Ukraine is especially relevant. Under conditions of economic crisis, devaluation and inflation, the loss of conventional markets, the state can not stop the decline in agricultural production, including in the livestock sector. In recent years, the development of domestic enterprises of the meat subcomplex is quite unstable. It is one of the important components of the food complex of Ukraine, but the unstable state of development of the complex is worrying because it is crucial for ensuring a stable socio-economic situation, food security and improving the quality of life of Ukraine. Today, the enterprises of the meat subcomplex are faced with the urgent task of developing and forming sustainable competitive advantages in domestic and foreign markets. Given this, the chosen research topic is quite relevant.



The scientific novelty lies in the study of development trends and assessment of the state of the meat product subcomplex, based on conceptual approaches to the formation of organizational and economic measures for the formation of animal husbandry.

## **2. The value of the meat subcomplex for the national economy.**

Ukraine has favorable natural and climatic factors for agricultural production. Under modern conditions, the meat subcomplex in our country and the world is one of the main producers of important protein products that are of biological value to the human body. The current stage of development of production relations in the meat subcomplex requires the development of effective mechanisms and approaches that would increase production efficiency, develop and implement a fundamentally new model of the sector to stabilize production, create favorable investment conditions, ensure competitiveness in the consumer market. to provide the population with meat products at the level of rational consumption norms [1].

As for domestic problems of development of the subcomplex, it should be noted that from the 90s of the last century and still there is a significant reduction in population livestock of all species except chicken, which has not only an economic basis.

In many countries around the world, livestock is a lucrative economic activity that provides the population with basic food and raw materials for the food industry, but consider how effective livestock in the domestic environment.

If we leave the catastrophic 90s of the twentieth century in the past, then, from 2000 to the end of 2021, the number of farm animals in all categories of farms in general decreased (Table 1) [2].

Thus, today, even if the trend of annual declining numbers of livestock and poultry is halted, it will take several decades to restore the level of the early 2000s. Also, given the climate problems and the current structure of agricultural production, it is safe to say that in the short and medium term it will be impossible to return to the number of livestock, which was about 20 years ago. Unfortunately, this valuable resource of genetic diversity in livestock is lost.

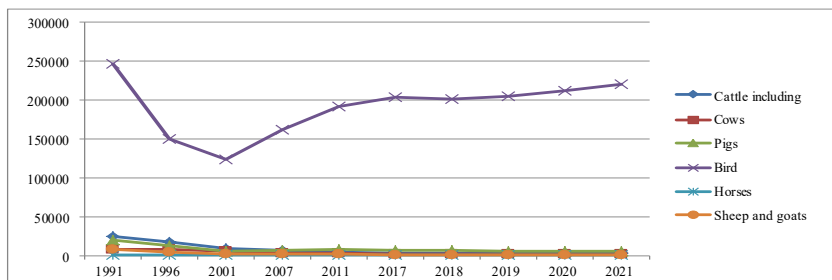
To visualize the analyzed trends of the meat product subcomplex, the dynamics of quantitative changes in the breeding of farm animals will be shown in Figure 1.

Table 1

**Number of farm animals at the end of the year in all categories of farms of Ukraine, thousands of heads**

Year	Cattle	Including cows	Pigs	Bird	Horses	Sheep and goats
1991	24623.4	8378.2	19426.9	246104.2	738.4	8418.7
1996	17557.3	7531.3	13144.4	149748.4	755.9	4098.6
2001	9423.7	4958.3	4958.3	123722.0	701.2	1875.0
2006	6514.1	3635.1	7052.8	161993.5	554.8	1629.5
2010	4826.7	2736.5	7576.6	191446.4	443.4	1832.5
2017	3750.3	2166.6	7079.0	203986.2	305.8	1325.3
2018	3682.3	2108.9	6669.1	201668.0	291.5	1314.8
2019	3530.8	2017.8	6109.9	204830.9	264.9	1309.3
2020	3332.9	1919.4	6025.3	211654.4	244.0	1268.6
2021	3092.0	1788.5	5727.4	220485.8	224.4	1204.5
The ratio of 2021 to 1991	-21531.4	-6589.7	-13699.5	-25618.4	-514.0	-7214.2

Source: formed by the author according to the State Statistics Service of Ukraine [3]



**Figure 1. Dynamics of quantitative indicators of the number of farm animals in farms of all categories of Ukraine, thousand heads**

Source: formed by the author according to the State Statistics Service of Ukraine [3]

The given data of the quantitative component of the livestock and poultry population in Ukraine give grounds to conclude that the meat subcomplex is developed exclusively due to chicken, the production of which is growing every year. Although the production of chicken, as in other categories, was in decline in the 90's, but now in this area there is a

rapid increase in production. And if from the 90's to the 2000's we saw a significant decline in livestock, then from the 2000's chicken production begins to increase rapidly. Thus, although chicken production still shows a negative trend compared to the 90s, but still due to a significant increase in production in the 2000s, the trend is positive. It is also worth noting that today the meat product subcomplex is provided with meat and raw meat exclusively due to chicken.

As for the other components of the studied unit, it is observed negative trend. Thus, the production of cattle in Ukraine during the study period decreased by 21531.4 thousand heads, pigs per 13,699.5 thousand heads, sheep and goats by 7,214.2 thousand heads, horses by 514 thousand heads.

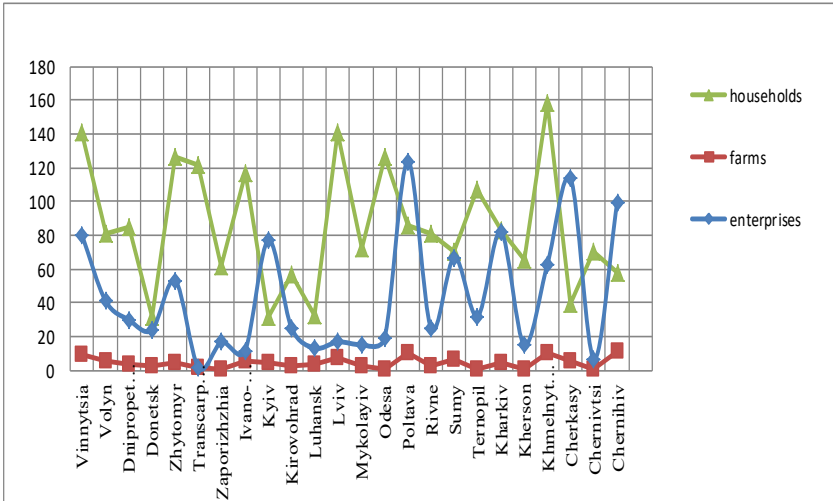
The level of the number of horses is characterized by the most negative dynamics, as in Ukraine there is no tradition of horse use, these animals are mostly bred in households for agricultural work, which can explain the significant decline in breeding this species.

Pig farming, the next branch of animal husbandry, which, despite the high demand for products, still reduces production rates, for a number of reasons.

And the next category is cattle, the number of which is rapidly declining every year. This trend can be explained by the fact that, first the tendency to reduce the number of animals is observed both in agricultural enterprises and in households. The second aspect of this problem is the change in the ratio of farm categories in the overall structure of all kept cattle. In the early 2000s, almost 53% of it was in agricultural enterprises, while 20 years later this proportion changed in favor of households. Currently, most of it is kept there up to 67%. The development of livestock in agricultural enterprises is characterized by a fairly high concentration of livestock in a small number of enterprises, while in most of them this industry is almost not developing.

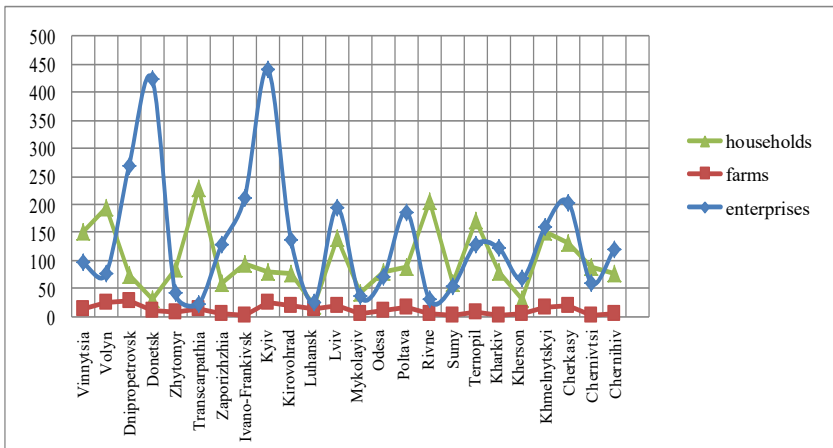
Given the fact that the meat subcomplex operates at the national and regional levels, it is necessary to provide indicators of the level of livestock (here are the main livestock: pigs and pigs), taking into account the regional vector (Figures 2-3).

According to Figure 2, we can say that cattle breeding is carried out mostly by households, which is the reason for the annual reduction in production. Because, as we noted in the first section of our study, one of the important problems of the industry, which is primarily.



**Figure 2. Cattle breeding by regions and categories of farms at the end of 2021, thousand heads**

Source: formed by the author according to the State Statistics Service of Ukraine [3]



**Figure 3. Raising pigs by regions and categories of farms at the end of 2021, thousand heads**

Source: generated by the author

With regard to cattle breeding, there is a low interest of producers in this market segment, due to high costs, long production cycle (over 1 year), and unpredictable pricing policy. There is also no government support for households that are leaders in this segment.

As for the regional aspect, the undisputed leaders in cattle breeding are: Vinnytsia region with 220.7 thousand heads, Zhytomyr region – 179.1 thousand heads, Poltava – 209.8 thousand heads and Kharkiv – 169.6 thousand heads. It should also be noted that the smallest share of cattle production falls on such areas as: Kherson – 80.7 thousand heads, Chernivtsi – 76.9 thousand heads, and Mykolaiv – 86.9 thousand heads.

According to the results of the analysis, we can conclude that pig breeding, in contrast to cattle, is mostly engaged not only in households but also in enterprises. The share of farms, both in cattle breeding and pig breeding, remains low.

In the regional aspect, the leaders in pig breeding are: Donetsk region with 454.6 thousand heads, Dnipropetrovsk region – 342.5 thousand heads, Ivano-Frankivsk region – 304.6 thousand heads, and Poltava region with a share – 273.7 thousand heads chapters.

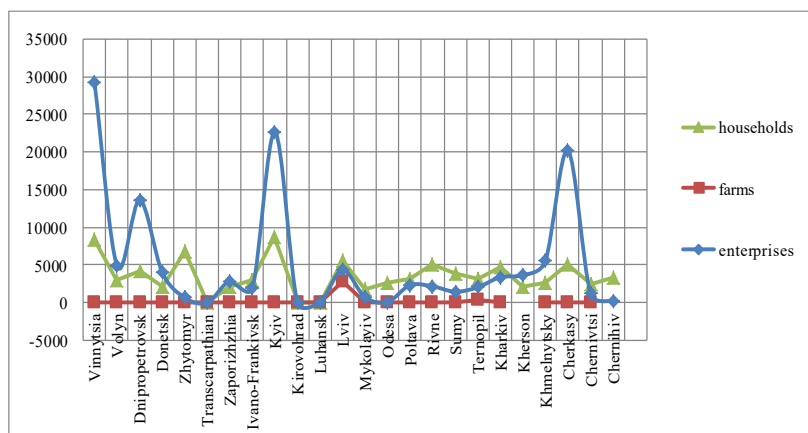
The lowest number of pigs is observed in such areas as: Zhytomyr – 126.6 thousand heads and Mykolaiv – 77.6 thousand heads.

As our research has shown, including the study of foreign experience, pork farming is a very promising area of this industry, due to the high consumption of this type of meat in the world, and in contrast to cattle production cycle is much shorter. However, an important factor influencing the significant reduction in this type of product is African swine fever, due to which the population is declining.

Foreign experience, such as China, where most of the African swine fever has been destroyed due to African swine fever, can help Ukraine overcome this negative impact, but thanks to government support and significant investments, China is once again leading the market in this area.

Opportunities to increase pork production are greater, because, firstly, the process of reproduction of breeding stock is 3-4 times less than cattle and, secondly, the decline in sows is less than the entire pig population. Currently, major pork producers are focusing on the production of meat and bacon breeds of pigs using modern technology, but most technology professionals are still in the process of finding optimal diets and value for money.

Next we will analyze the poultry industry, whose products, unlike cattle and pigs, have a faster rate of reproduction, greater affordability, is in high demand for their products from the population. Analyzing Figure 4, we see that the leaders in chicken breeding are the following regions: Vinnytsia – 37,505.4 thousand heads, Kyiv – 31,387.7 thousand heads and Cherkasy – 25,261.6 thousand heads. Significantly lag behind in terms of livestock growth: Transcarpathian – 3572.8 thousand heads, Chernihiv – 3548.2 and Luhansk region – 931.4 thousand heads.



**Figure 4. Chicken farming by regions and categories of farms at the end of 2021, thousand heads**

Source: generated by the author

Thus, having studied the structure of changes in the number of farm animals in terms of the main categories of farms and regions (Fig. 1-3), we found several trends. In the structure of cattle and pigs, the leading positions are occupied by households, whose activities are currently not provided with state support, and due to the long production cycle and a number of problems we mentioned earlier, production is declining every year as a result. Chicken meat, which is less expensive to produce, has a faster production cycle, which reduces risks. Therefore, this segment is attractive for businesses. In fact, the production of beef and pork is saved from complete decline by large agricultural enterprises, which are mostly part of agricultural holdings.

The main problem in the development of domestic livestock is the imperfect price mechanism for the redistribution of value added throughout the chain from production to sales to the final consumer. As a result, both producers and consumers lose.

If we analyze the prices for cattle (live weight), we can see that a significant proportion of beef is sold at relatively low prices. That is why beef is quite unprofitable (Table 2).

Table 2

**Distribution of Ukrainian enterprises  
at average sales prices of cattle (live weight) in 2021 year**

	Number of enterprises		The volume of products sold	
	units	In% to the total	Thousands tone	In% to the total
Enterprises	1305	100.0	174.0	100.0
Of these, with an average selling price, UAH per 1 ton				
Up to 10000.0	5	0.4	0.4	0.2
10000.1-20000.0	102	7.8	4.3	2.5
20000.1-30000.0	950	72.8	112.2	64.4
30000.1-40000.0	199	15.2	44.0	25.3
40000.1-50000.0	32	2.5	10.4	6.0
More than 50,000.0	17	1.3	2.7	1.6

*Source: According to research and information analysis of the State Statistics Service [3]*

The issue of pricing is a very painful topic of discussion, especially in the meat subcomplex. Many manufacturers see the problems of the industry in low purchase prices.

At the same time, as noted by most domestic experts, the price factor still remains decisive for the producer in choosing a further strategy for the development of the meat business and the competitiveness of the industry as a whole. If you trace the entire chain of price formation from the purchase of meat from the producer and before it goes on sale in the retail chain, you can see that the difference between them is growing significantly. At the same time, the cost of production is steadily growing from year to year.

There is a significant imperfection of market relations between the direct producers and processing enterprises, which causes price disparities

and low profitability of the first in this model of relationships. One of the ways out of the crisis related to the mismatch between production costs and purchase prices, we believe, is to encourage the rebuilding of long-term stable relations, encourage and interest producers in conditions where processing companies are encouraged to rebuild long-term stable relations, encouragement and interest producers under conditions when processing enterprises are interested in cooperation, understand the problems of the producer and aim to help reduce the cost of cultivation by creating a centrally managed rhythmic supply system.

The resumption of the normal operation of some meat processing enterprises was facilitated by the dynamic increase in investment in the meat processing industry together with the correctly chosen strategy for positioning finished products. The relatively low purchasing power of the population over the past more than 18 years has generated demand in the Ukrainian market for cheap and inexpensive deep-processed meat products of acceptable quality in industrial volumes. These are products of medium quality, but as a result of the situation with low effective demand of the population, it has found its niche in the market. In its production, cheap types of second-class raw meat were used, which usually include hams, carcass skeletons, leather and others. Middle- and low-income consumers prefer such meat products in urban markets, where it is better and presented in a wider range. Lower category pork and lard, as well as chicken continue to be substitutes for beef. Regarding the latter, it should be noted that in Ukraine the domestic market has been practically won back by domestic poultry producers.

At the same time, one should not expect a proportional increase in food expenditures as domestic consumers' incomes increase – the share of food expenditures with declining incomes will decrease, and low-processed products will be replaced by higher value-added products.

The significant decline in the purchasing power of the population along with the relative increase in the trade margin on meat and meat products due to the privatization of the retail network was another reason why the majority of the population became unavailable a significant number of quality products. The decrease in sales volumes in the retail network had the most significant impact on the lack of working capital of most large processing enterprises.



Improving economic efficiency and increasing livestock production is impossible without achieving high competitiveness, both in the domestic food market and abroad. Significant reduction in production and livestock is a consequence of deteriorating key indicators of competitiveness – low purchase prices and high cost of livestock production.

The competitiveness of the industry is primarily the ability to operate efficiently and ensure profitability from the sale of products in a competitive market environment. That is, the production and sale of products for profit for simple and advanced reproduction. Domestic experience of agricultural enterprises has convincingly shown that in market economic relations without the use of innovative approaches, technologies and solutions to overcome the crisis in the industry and reach a break-even level of management.

Ensuring profitable production of meat products subcomplex requires additional financial investments in the reconstruction of livestock facilities, improving the breed composition of livestock and the need to move to robotic technologies for its maintenance, modernization and renewal of milking equipment and feeding system. It would be expedient for Ukraine to use foreign experience in introducing innovations in this field, in particular Smart Farm, selection, types of state support

Expansion is envisaged as a priority area for the development of the industry and improving the fattening and procurement network and the relationship between producers and processors; increase in the volume of livestock purchases in personal households and farms; reconstruction and technical re-equipment of existing processing enterprises; development and creation of modern efficient equipment for primary meat processing; development and creation of modern packing equipment; development and creation of modern refrigeration and energy equipment, etc. At the present stage, the system of economic measures should provide state support for livestock production, which should be aimed at intensifying livestock production, increasing animal productivity, reducing the cost of production,

Thus, from the analysis of the development of the meat product subcomplex, we can conclude that the most important task of the industry today is to stabilize the negative trend of reducing the number of cattle and pigs. Households and small farms need to be encouraged to increase meat production, which cannot be done without government support, to ensure

effective innovation and investment policies. As this sector is integrated both vertically and horizontally, it is necessary to ensure the coherence of national policies directly in the field of animal husbandry, agriculture and trade.

### **3. The main trends in the development of the meat product subcomplex**

The total rate of livestock and poultry in agricultural enterprises in January – December 2021 increased compared to the same period last year by 29.5 thousand tons due to an increase in poultry by 19.1 thousand and pigs by 19.1 thousand tons (Figure 5). Cattle breeding decreased by 8.5 thousand tons. The ratio of breeding to sales indicates the amount of available meat resources on the date, which in 2021 for all species of animals amounted to 101.2%. In the study period, only meat resources of pigs were increased – by 7.5%. Against the corresponding period of 2020, the availability of meat resources for all species remained unchanged.

In January-December 2021, compared to 2020, sales of slaughter of livestock and poultry decreased in all categories of farms by 39.3 thousand tons, including agricultural enterprises by 3.4 thousand, households by 35.9 thousand tons.

In January-December 2021, Vinnytsia, Cherkasy, Dnipropetrovsk and Kyiv oblasts were the leaders among the regions of Ukraine in slaughtering livestock and poultry for all categories of farms. 3454.3 thousand tons).

In January-December 2021, compared to the same period last year, sales of livestock and poultry for slaughter in all categories of farms increased by seven regions, in agricultural enterprises – eleven, in households – five regions.

According to the results of research, during the study period there is an increase in meat production per capita.

In our opinion, this circumstance is caused by two main factors: the growth of meat production in Ukraine and the decrease in the population in Ukraine, which is observed today.

Meat production in Ukraine has increased in recent years, mainly due to the development of poultry. The cessation of growth rates in poultry this year will affect the overall reduction of meat production in Ukraine [4, p. 64].

This circumstance is caused by a number of factors, including effective state support for the revival of poultry farming.

The livestock of Ukraine includes livestock, pigs, poultry, sheep, less common: rabbit breeding, fish farming, beekeeping, animal husbandry and others.

Livestock is the most complex and extremely important branch of agriculture, which is based on cattle breeding (hereinafter – cattle). The main products of the industry: meat and milk. Pig farming provides the population with food such as meat and lard. Among farm animals, pigs have a high slaughter yield, and pork has a high content of complete and easily digestible protein and essential amino acids [5, p. 10].

In recent decades, there has been a significant decline in livestock, pigs and sheep – a reduction in livestock production and a reduction in the number of major animal species in general. Thus, according to the State Statistics Service of Ukraine, in 1990–2021 the number of farm animals decreased by an average of 80% (Table 3).

The long-term reduction in the number of farm animals has led to a redistribution of the share of different species of farm animals in the total livestock. If in 1990 the leading position was occupied by cattle, since 2006 pig farming has taken the first place in terms of the number of animals. In 2019, pig farming accounted for about 57%. One of the reasons for the rapid growth of pig farming is the precocity and fertility characteristic of pigs, which make it possible to obtain from them in a short period of time much more meat than from other farm animals.

Today the leading position in the field of animal husbandry is occupied by poultry farming. The consumer value of poultry is determined by its ability to supply valuable food – meat and eggs.

According to the State Statistics Service of Ukraine, since 1991 there has been a significant reduction in the number of birds. Only in 2001 did the number of poultry in Ukraine begin to increase gradually. Today there is an active recovery and development of the industry, as evidenced by the general trend towards increasing poultry in Ukraine and increasing consumer demand for poultry meat [6, p. 721].

The situation in livestock remains extremely unsatisfactory. The unattractive investment attractiveness of the industry in the conditions of saturation of the market with cheaper poultry meat with low purchasing power of the population, forces producers to gradually abandon this type of activity. Complicates the situation and the lack of transparent support mechanisms from the state (Table 4).

Table 3

**The number of farm animals at the end of the year  
in all categories of farms in Ukraine, thousands of heads**

Year	Cattle	Including cows	Pigs	Bird	Horses	Sheep and goats
1991	24623.4	8378.2	19426.9	246104.2	738.4	8418.7
1996	17557.3	7531.3	13144.4	149748.4	755.9	4098.6
2001	9423.7	4958.3	4958.3	123722.0	701.2	1875.0
2006	6514.1	3635.1	7052.8	161993.5	554.8	1629.5
2010	4826.7	2736.5	7576.6	191446.4	443.4	1832.5
2017	3750.3	2166.6	7079.0	203986.2	305.8	1325.3
2018	3682.3	2108.9	6669.1	201668.0	291.5	1314,8
2019	3530.8	2017.8	6109.9	204830.9	264.9	1309.3
2020	3332.9	1919.4	6025.3	211654.4	244.0	1268.6
2021	3092,0	1788.5	5727.4	220485.8	224.4	1204.5
The ratio of 2021 to 1991	-21531.4	-6589.7	-13699.5	-25618.4	-514.0	-7214.2

*Source: formed by the author according to the State Statistics Service of Ukraine [3]*

As of January 1, 2021, the number of cattle in all categories of farms decreased by 192.5 thousand heads compared to the same period last year, including 51.9 thousand in agricultural enterprises and 140.6 thousand in households. thousand heads.

As of January 1, 2021, 65.6% of the total number of cattle is concentrated in households, and only 34.4% in agricultural enterprises. In Cherkasy, Kyiv, Chernihiv, Poltava and Kharkiv oblasts, the share of livestock in agricultural enterprises was 74.1%, respectively; 71.9; 63.7; 63 and 52.8%.

As of January 1, 2021, compared to the same period last year, enterprises of all categories have a negative trend in the growth of cattle in all regions of the country. Only the farms of the population of Zakarpattia region managed to increase by 0.1 thousand heads.

As of January 1, 2021, compared to December 1, 2020, there was a tendency to reduce the number of cattle in all categories of farms – by 248.7 thousand heads, including in agricultural enterprises – by 6.5 thousand, in households – by 242.2 thousand heads.

**Dynamics of the number of farm animals by categories of farms  
(at the end of the year; thousand heads)**

Indicator	Year					2021 in% to	
	2000	2010	2019	2020	2021	2000	2021
Agricultural enterprises							
Cattle	5037.3	1526.4	1138.1	1049.5	1008.4	20	96.1
In % to everything	53.5	34.0	34.1	33.9	35.1	-18.4 pp	1.2 pp
Pigs	2414.4	3625.2	3395.6	3300.1	3629.5	150.3	109.9
In % to everything	31.6	45.5	56.4	57.6	61.8	30.2 pp	4.2 pp
Bird	25352.9	110561.3	118812.9	127773.2	109737.0	432.8	85.8
In % to everything	20.5	54.2	56.1	58.0	54.7	34.2 pp	-3.3 pp
Households							
Cattle	4386.4	2968.0	2194.8	2042.5	1865.6	42.5	91.3
In % to everything	46.5	66.0	65.9	66.1	64.9	18.4 pp	-1.2 pp
Pigs	5237.9	4335.2	2629.7	2427,3	2246.7	42.9	92.6
In % to everything	68.4	54.5	43.6	42.4	38.2	-30.2 pp	-4.2 pp
Bird	98369.1	93278.5	92841.5	92712.6	90914.9	92.4	98.1
In % to everything	79.5	45.8	43.9	42.0	45.3	-34.2 pp	3.3 pp

Source: formed by the author according to the State Statistics Service of Ukraine [3]

At the same time, there are practically no specialized beef cattle left in Ukraine. During this period, a large number of farmers left this market – their share in beef production decreased from 40% to 24%.

In the course of the study it was found that the main factors reducing the production of meat products are:

1. High cost of beef produced in non-specialized enterprises, which is uncompetitive in terms of saturation of the meat market with cheaper poultry, especially in conditions of limited purchasing power of the population.

2. Due to declining demand, the transition of beef into a niche product:

a) the demand for beef from the population is traditionally lower than for pork, and in Ukraine there is virtually no culture of steak – the main product on which meat production can be targeted;

b) in the conditions of active development and aggressive competition on the part of pig breeding, the inevitable process of squeezing beef from the consumer market;

c) the decline in supply has led to the fact that processing companies have significantly reduced demand for beef. The recipe of meat products, where beef is used, is gradually being replaced by pork or poultry. The same individual enterprises for which beef is an indispensable raw material, due to the higher added value of the final product, prefer to develop their own raw material production;

d) the prospects for the development of export markets are also quite pessimistic.

3. Minimum amount of state support for the industry with not always transparent and clear mechanisms for its distribution.

As a result, the significant potential of livestock, which was formed in 1970-1990, has now exhausted itself. For the last ten years, beef production has remained largely a by-product of dairy farming. At the same time, given the current realities in which the main focus in livestock is on the development of highly productive dairy production, in the near future is expected to further reduce the supply of cattle meat.

In recent years, pig farming has gained significant momentum, especially in the sector of large-scale agricultural production.

As of January 1, 2021, the number of pigs in all categories of farms increased by 113 thousand compared to the same period last year, including in agricultural enterprises – by 320.2 thousand, while in households there was a decrease – by 207, 2 thousand heads.

As of January 1, 2021, in all categories of farms the largest number of pigs was concentrated in Kyiv – 547 thousand heads (9.4% of the total livestock in Ukraine), Donetsk – 493.6 thousand (8.5%), Lviv – 346.1 thousand (5.9%) and Cherkasy – 346.1 thousand heads (5.9%) regions.

In agricultural enterprises, the largest number of pigs is kept in Donetsk – 94% of the total population in the region, Kyiv – 86.8, Dnipropetrovsk – 81 and Poltava – 77.2% of regions.

In all categories of farms on January 1, 2021, compared to last year, twelve regions achieved an increase in the number of pigs from 0.4 to 50.7 thousand heads. The largest reduction in livestock in farms of all categories was in Rivne, Zaporizhia, Odessa and Volyn regions (by 10.8; 13; 17.3 and 19.6 thousand heads, respectively).

It should be noted that in December 2020 in all categories of farms there was an increase in the number of pigs by 276.4 thousand heads, including in agricultural enterprises – by 31.5 thousand, households – by 244.9 thousand heads. Last but not least, such rates were ensured by the entry into the planned production facilities of a number of investment projects in pig breeding, which started in 2005–2008. At present, these enterprises have become leaders in the pig industry of Ukraine in all production indicators: pig population, production volumes, live weight gain, pork production volumes.

Given the pig development plans announced by a number of large companies, as well as the existing production capacity in the industry, the current decline in the pig population in the medium term should not have a significant impact on the supply of pork [7, p. 10].

Poultry in all categories of farms on January 1, 2021 decreased compared to the same period last year by 20.6 million heads, including in agricultural enterprises – by 18.8 million, and in households – by 1.8 million heads.

As of January 1, 2021, the main poultry population in all categories of farms was concentrated in Vinnytsia, Cherkasy and Kyiv oblasts, where the poultry population ranges from 22.7 million in Kyiv to 33.6 million in Vinnytsia.

The smallest number of poultry (up to 5 million heads) in all categories of farms was in Kirovohrad, Poltava, Sumy, Donetsk, Ivano-Frankivsk, Zaporizhia, Zakarpattia, Chernihiv, Chernivtsi, Odessa, Mykolaiv and Luhansk regions.

It should be noted that in 2021 in all categories of farms in only three regions there was a positive trend in increasing poultry.

The main reasons that could lead to a decrease in poultry at meat enterprises:

- high rates of production growth in previous years, which at this stage are constrained by slower growth rates of domestic consumption, including due to limited purchasing power of the population;

- additional pressure on the meat market due to competition from the actively developing pig industry;
- export supplies, despite their active development, cannot yet be a real compensator for internal imbalances, and their further development is constrained by the protectionist policies of the European Union;
- rising prices for incoming material and technical resources and services (feed, veterinary drugs, logistics, energy resources, etc.) against the background of fairly stable prices for finished products;
- further consolidation of the poultry industry and increased competition led to the exit of a number of small and medium-sized producers.

According to the results, the process of concentration of livestock and poultry is currently taking place in animal husbandry (Table 5).

Poultry is one of the most consolidated branches of agriculture. The share of the two largest companies MHP and Agromars in the market is over 65%, taking into account all their structural units. The total number of business entities engaged in the production of poultry meat in 2021. was 385 units. The activity of TOP-20 of the largest enterprises for the production of poultry meat in agricultural enterprises in 2020 formed a share of 91.4%.

All agricultural holdings, without exception, have built a system of full production cycle – from hatching eggs and raising young to complete processing of poultry meat. Although with varying degrees of security, all companies have their own forage bases for growing key forage crops. Elevators and feed mills are also included in the integrated structure. The finished products of the companies have their own well-known brands. Product promotion is facilitated by active work with retail chains throughout Ukraine, along with the creation of its own sales networks.

Note that against the background of slow growth in consumption of poultry meat in the domestic market, in today's format, when the bulk is consumed in the form of chilled products, further expansion of the domestic market may depend on the development of new areas. For example, from the development of sales through the HoReCa segment, especially street food and fast food restaurants. The creation of such structures within the holding is possible only for large players, as well as the opportunity to become a supplier to international fast food chains entering the Ukrainian market. For example, Kentucky Fried Chicken (KFC) is the third largest chain of fast food restaurants in the world,



Table 5

**Grouping of enterprises by number of farm animals at the end of 2021**

Indicator	Number of enterprises		Number of farm animals	
	units	in % to the total quantity	thousand heads	in % to the total quantity
Cattle				
<b>Enterprises</b>	<b>1911</b>	<b>100.0</b>	<b>1008.4</b>	<b>100.0</b>
of them had, heads				
up to 50	494	25.9	9.8	1.0
50–99	165	8.6	11.8	1.2
100–499	N	31.9	176.7	17.5
500–999	361	18.9	249.6	24.7
1000–1499	130	6.8	159.3	15.8
more than 1500	151	7.9	401.2	39.8
Pigs				
<b>Enterprises</b>	<b>1437</b>	<b>100.0</b>	<b>3629.5</b>	<b>100.0</b>
of them had, heads				
up to 100	454	31.6	18.1	0.5
100–199	181	12.6	26.0	0.7
200–499	247	17.2	81.7	2.3
500–999	164	11.4	116.3	3.2
1000–4999	247	17.2	580.0	16.0
5000–9999	67	4.7	466.3	12.8
more than 10,000	77	5.3	2341,1	64.5
Bird				
<b>Number of farm animals</b>	<b>385</b>	<b>100.0</b>	<b>109737.0</b>	<b>100.0</b>
of them had, heads				
to 4999	142	36.9	139.3	0.1
5000–49999	107	27.8	2387.7	2.2
50000–99999	29	7.5	2075.0	1.9
100000–499999	71	18.4	16674.3	15.2
more than 500,000	36	9.4	88460.7	80.6

Source: formed by the author according to the State Statistics Service of Ukraine [3]

which in 2012 announced its entry into the Ukrainian market. KFC specializes mainly in chicken dishes.

The leader of the poultry industry – MHP Holding – has already taken steps in this direction. Thus, in 2011 they launched their own chain of fast food restaurants under the brand “Wings”.

The presence of additional market tools in the company’s structure, which allow to expand and increase sales opportunities, also gives some competitive advantages. This is clearly demonstrated by the Fozzy Group holding, which is one of the leaders in Ukrainian chain retail. In particular, the Poultry Poultry Farm, which is part of the holding’s structure, has a stable sales channel, which has a positive effect on the company’s production indicators. Thus, against the background of the general correction of the market in the downward direction, at this enterprise in 2019 increased both poultry (+ 17%) and the volume of poultry production (+ 42%).

In 2021, the processes of consolidation of production resources in the pork market continued with a redistribution in the structure of breeding and sale of pigs from households to vertically integrated agricultural enterprises.

Large holding structures due to the scale of production and great opportunities to optimize their costs over the past two years have shown steady growth in key production indicators (pig population, production and production volumes), almost fully implementing previously announced development plans [8, p. 108].

And this despite the rather difficult situation in the pork market, which was marked in 2020 and 2021. Among the main factors that put pressure on the market, we can identify the following factors:

- significant increase in feed costs. In particular, for barley – a key feed component in the cost structure of pork, prices in 2020 compared to the previous year increased by 33%, in 2021 – by 41%;

- for a long time pork prices remained low;

- slow growth of meat and pork consumption per 1 person / year. Despite the competitive price and significant supply of pork on the market, the actual consumption of pork in Ukraine over the past two years increased by 15%. At the same time, the consumption of all types of meat for the same period increased by only 4%. At the same time, the meat processing industry usually focuses on the import of cheaper by-products to optimize the cost of finished products;

- poorly forecasted pork export market.

Despite the positive growth dynamics of large companies in recent years, the short-term prospects of the pork market can be assessed with restrained pessimism. The problems described earlier, against the background of a possible aggravation of the situation with the feed component, may lead to market stagnation, which will affect not only small and medium enterprises, but also large holdings. First of all, these are the companies where pig breeding is not a core business and where the level of efficiency is traditionally lower than that of specialized companies.

For example, in the group of holdings for which pig farming generated less than 30% of revenue from the sale of all agricultural products, the number of pigs in 2019 decreased by 36% to 403 thousand heads. The share of this group of holdings in total pork production in 2021 was 14.6%.

Among other things, the biggest impact of rising grain prices may be felt by companies that are insufficiently provided with their own grain / feed production.

Analysis of the impact of production costs (economic efficiency) and average daily live weight gain (production efficiency) on the development of pig production in the company, also confirms the previous conclusions – the vector of sustainable development in this situation, preserved only high-tech and efficient companies. Most often, large companies are actively developing all the elements of vertical and horizontal integration, aimed at optimizing costs, reducing economic and production risks, increasing the overall stability of the enterprise.

The immediate prospects of the pork market will directly depend on the volume of pork consumption, which in turn will be determined by the influence of several main factors. First of all, it is possible economic growth and growth of purchasing power of the population, which will not only directly increase the consumption of all types of meat, but also contribute to structural changes in the meat consumer basket in the direction of increasing the share of pork.

The second factor is the awareness of the need for active input of own products in the meat processing sector and the production of finished meat products. State lobbying for strict control over the production of finished meat products may free up additional niche demand for pork producers (3-5 kg / year per person), which is currently occupied by cheap imported raw materials, partly poultry and other meat products. meat substitutes used

in domestic meat and sausage products. It is estimated that no more than 20% of pork is subjected to deep processing for further production of meat and sausage products. The rest of the pork enters the consumer market in the form of steamed, chilled meat or minced meat. At the same time, the possible implementation of such a scheme will depend even more on the general economic situation in the country, given that

The last fifteen years have been extremely difficult for Ukraine's livestock, its meat component, putting one of the largest livestock industries on the verge of extinction, especially in agricultural enterprises. Every year, official statistics show new negative records set by the industry: the number of cattle is declining, beef production is falling as a result, now we have the lowest production figures in the industry in the history of statistical observations.

At the same time, it should be noted that in recent years there have been several attempts to implement projects focused mainly on beef cattle breeding. Of the large holdings, beef cattle breeding with the breeding of beef breeds is emphasized, MHP, Ukrland Farming, and OSI Group enterprises continue to be engaged. The active development of meat cattle breeding can also be distinguished at the enterprises of the holding companies Agrain, VV Holding, AgroInvestGroup. The experience of each of these companies in the beef market is unique in its own way, having its own history of formation, its own approaches to the development of the market, its strengths and weaknesses [9, p. 105].

Elsewhere, the supply of cattle meat by large agricultural companies in Ukraine is formed by holdings that specialize in milk production or have significant production resources in meat and dairy farming. At the same time, the latter form the volume of production due to the consolidation of a large number of small and medium-sized farms.

The first category of holdings includes Astarta agricultural holding – one of the leaders in the dairy sector of Ukraine, “Kernel”, “Svarog”, “Agroproinvest” and others. For each of these companies, milk production has a higher priority in livestock, although, in fairness, we note that some companies in these companies are considering opportunities for development and meat production. A similar approach is already being implemented in the Svarog Corporation, as well as the Astarta agricultural holding.

The second category includes enterprises that are part of large multidisciplinary agricultural associations. The most striking examples of this group are the holdings representing the large agricultural business of eastern Ukraine HarvEast, Agrofirma Shakhhtar, Agroton, Privat Agro Holding.

It should be noted that the degree of vertical integration and concentration of production in livestock is much lower in terms of development of the largest pig holdings. And in the near future, this situation is unlikely to change dramatically. The problem is not so much the lack of necessary technologies, but the low solvency of demand in the domestic market, which can actually offset the competitive advantages that the company receives by building a vertically integrated production. But even so, the largest holdings are trying to increase their presence not only in the commodity market, but also in the market of finished products. In particular, in 2020 the share in the production of chilled and frozen beef by meat processing enterprises that are part of agricultural holdings was almost 19%.

In livestock at the present stage, most medium and large producers focus on the development of high-yielding dairy and meat-dairy areas of livestock, gradually removing from circulation unproductive and inefficient livestock resources. In this situation, in the next two or three years, agricultural enterprises are expected to further gradually reduce the number of cattle with a possible stabilization of 1.45-1.47 thousand heads. At the same time, the number of cows will be at least 40%. Given that livestock production is refocusing on the development of highly productive dairy products, the stabilization of cattle in the short term will be accompanied by a further reduction in the supply of beef from agricultural enterprises.

At the same time, the degree of vertical integration and concentration of production in livestock is much lower in terms of development than the largest pig holdings, in order to dramatically improve the situation with regard to a significant increase in the supply of goods in the near future. This is due not only to the lack of necessary technologies, but also to the low solvency of demand in the domestic market, which can actually offset the competitive advantages obtained by a vertically integrated manufacturer. However, even in spite of this, the largest holdings are trying to increase their presence not only in the commodity market, but also in the market of finished products.

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In developed countries, the level of concentration of production is also high. For example, in the US, the 4 largest producers owned 35% of meat and meat products, and the 8 largest producers controlled 50% of the market [10, p. 67].

According to the results of the study, livestock farming of agricultural enterprises and households forms the raw material base for meat processing enterprises.

The total inflow of livestock and poultry in live weight to processing enterprises in 2021 compared to the corresponding period of 2020 decreased by 6.0% (113.5 thousand tons) (Table 6).

The volume of purchases of livestock and poultry by meat processing enterprises decreased compared to last year by 22% (38.5 thousand tons), in particular in agricultural enterprises – by 9.1% (27.3 thousand tons), in households by 53, 3% (11.4 thousand tons).

Table 6

### Dynamics of receipt of farm animals and poultry at processing enterprises (thousand tons)

Indicator	Year					2020 in % to	
	2010	2016	2019	2020	2021	2010	2019
Total revenue	1442.9	1689.9	1752.3	1891.5	1778.2	123.2	94.0
Bought – all	512.7	395.2	327.5	321.3	282.7	55.1	88.0
including in							
enterprises	406.6	376.5	302.7	300	272.7	67.1	90.9
households	106.1	18.7	24.8	21.3	10	9.4	46.9
Of the total by species							
cattle	224.7	123.8	124.4	120.6	83.6	37.2	69.3
pigs	230.4	325.3	308.5	317.3	303.1	131.6	95.5
bird	947.8	1203.3	1317,8	1451.7	1389.4	146.6	95.7
Received for processing of animals actually raised by processing enterprises	894.3	1258	1380.8	1532.1	1459.1	163.2	95.2
Accepted on a tolling basis	35.9	36.7	44	38.1	36.4	101.4	95.5

Source: formed by the author according to the State Statistics Service of Ukraine [3]

There was an increase in purchases of poultry meat processing plants by 27.3% (6.1 thousand tons), but decreased: cattle by 29.6% (33.4 thousand tons), pigs – by 6.1 % (11.3 thousand tons).

The largest suppliers of raw meat for processing this year were farms in Vinnytsia and Cherkasy regions.

In the current year, the highest marketability of meat was formed in farms of all categories of Vinnytsia, Dnipropetrovsk and Cherkasy regions (average marketability of meat is defined as the total supply of livestock and poultry to processing enterprises in 2021 before total meat production), respectively 93.2; 82.7 and 74.9%.

Livestock – an industry that was once the raw material base for the entire meat processing industry of Ukraine, is now taking on the last role, annually reducing the supply of products to meat processing plants. Thus, compared to the early 90's, the volume of purchases of cattle for slaughter decreased by more than 10 times, amounting to only 83.6 thousand tons in 2021.

As we noted earlier, the decline in consumer demand for cattle from meat processing is the combined effect of a large number of interrelated socio-economic and production factors that have also determined the current state of livestock in Ukraine. Among the main factors we can identify the following:

- shortage of supply and instability of supplies of commodity consignments of cattle for slaughter;
- reduction of consumer demand in the segment of finished meat products with high added value;
- general decrease in the share of beef and veal in the structure of meat consumption due to their replacement by poultry and pork;
- loss of positions in export markets due to reduced competitiveness of Ukrainian beef compared to Brazilian and Argentine beef;
- gradual increase in imports of beef and beef by-products.

As a result of the influence of these factors – the manufacturing industry, which consumed about 70% of total output, went through a gradual decline in effective demand.

Now about the largest buyers-processors of cattle in Ukraine. First of all, we note that the lack of visible prospects in animal husbandry (its meat component) inhibits the process of consolidation and creation of integrated production models, such as those currently implemented in pig farming [11, p. 337].

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Most often, the main buyers of cattle are some independent meat processing plants that use beef and veal in the recipe of their meat products, such as “Yatran”, “Kremenchuk meat”, “Agroproduct” and others.

Among the main holdings operating directly in the meat processing sector, we can single out the largest cattle processor – Kozyatyn Meat Processing Plant (part of OSI Group), Druzhba Narodiv (part of MHP), Tulchin Meat “(part of Terra Food),” Globin Meat Plant “(part of the corporation” Globine“). It should be noted that these companies are working in the meat processing segment, but are also actively developing their own raw material base. With the exception of Globino Corporation, the rest of the companies are sufficiently provided with raw materials of their own production.

In January-December 2021 compared to the corresponding period of 2020 there was an increase in production: frozen pork by 53.8%, frozen poultry by 16.1, fresh or chilled pork by 7.4 and sausages by 1.9%. At the same time there was a reduction in production: frozen beef by 32.8%, fresh or chilled beef by 22.9 and fresh or chilled poultry meat by 9.2% (table 7).

Table 7

### Dynamics of production of the main types of meat products

Indicator	Year					2021 in % to	
	2010	2016	2019	2020	2021	2010	2021
Beef and veal, fresh or chilled	62.3	50.0	56.3	55.8	41.5	66.6	74.4
Pork is fresh or chilled	197	235	223	226	225	114.2	99.6
Beef and veal are frozen	17.8	20.7	20.2	16.6	11.7	65.7	70.5
Frozen pork	8.3	12.4	6.7	11.8	14.0	168.7	118.6
Chicken, chicken, fresh or chilled	450	326	267	249	227	50.4	91.2
Chicken, chicken, fresh or chilled	228	362	412	391	349	153.1	89.3
Meat of chickens, hens, frozen	31.9	145	104	128	154	482.8	120.3
Sausage and similar products	286	229	248	237	236	82.5	99.6

*Source: formed by the author according to the State Statistics Service of Ukraine [3]*

The sausage production sector is the second most important in the meat industry of Ukraine after meat production. It accounts for more than 20% of the total volume of meat and meat processing and 2/3 of the total number of finished meat products. The total range of sausages produced in Ukraine



covers more than 12 varieties, but only a few types are in demand in the domestic market.

The most popular are cooked sausages and semi-smoked sausages, these products account for more than 80% of the market for all sausages.

Currently, about 500 companies operate in the production of sausages. In recent years, the industry is undergoing processes of modernization of enterprises through investment, consolidation of production and the gradual displacement of small and medium-sized producers.

In 2021 it was produced 225 thousand tons of pork, mostly companies produce fresh or chilled pork, the share of which in the total structure of pork production was at 96%.

The share of frozen pork has been gradually declining in recent years. Thus, in 2006 it accounted for 17%, and in 2021 – 4%. Such trends are due to the predominant use of chilled raw materials in industrial processing. It is also influenced by the intensive development of large retail chains (METRO, Auchan, Billa, Fozzy Group and others), which are interested in the refrigerated product and provide retail space for its sale. At the same time, they set certain requirements for the regularity of deliveries, quality, appearance and packaging of goods. Only large vertically integrated enterprises that also raise pigs are able to meet such requirements.

Such tendencies lead to intensive processes of consolidation of enterprises in the industry. Thus, if in 2010 small enterprises (up to 2 thousand tons) accounted for about 70% of the market, in 2016 their share decreased to 40%, and in 2021 – to 23%. In total, TOP-20 accounts for 67% of all pork production.

In 2021, the trend of decreasing beef production due to a shortage of raw materials due to the reduction of the cattle population continued. Beef production in Ukraine was represented by two product segments: chilled and frozen products. In 2010–2021, the share of frozen products ranged from 28%.

Note also the regional specifics of the location of beef producers: in the west of the country are concentrated producers who sell it as a final product – export or sell to meat processing enterprises from the south-eastern regions of Ukraine, which in turn also produce beef, but not for sale, and for own consumption – further for the production of meat and sausage products.

The reduction in beef production is taking place against the background of rapid market consolidation. Thus, the top 20 companies in 2008 produced 38%, in 2010 – 58%, and in 2021 this figure was 66%.

The trend of annual increase in poultry production, which has remained unchanged over the past ten years, continued in 2021. Compared to 2010. Poultry meat production (chilled and frozen) increased by 2.4% to 730 thousand tons. the trend of increasing production in the poultry processing sector will continue.

Poultry production in Ukraine is represented by two product segments: chilled and frozen products. In 2010–2021, the share of frozen products ranged from 10-14%.

The increase in poultry meat production in recent years has taken place against the background of rapid market consolidation and a reduction in the number of small and medium-sized producers. In 2021, TOP-20 of the largest enterprises in the industry produced 94% of production.

It should be noted that currently the products of the meat product subcomplex are the object of foreign trade.

According to the State Customs Service of Ukraine in January – December 2020, Ukraine:

- exported meat and meat products in the amount of 665.1 million dollars. USA. Compared to the same period last year (USD 722.4 million), this figure decreased by USD 57.3 million. The United States (by 7.9%);

- imported meat products in the amount of 201.7 million dollars. US dollars, which is 16.6 million dollars. US dollars (9%) more than in January-December 2020 (185.1 million US dollars).

The trade balance for this product group is positive and amounts to 463.4 million dollars. USA. Compared to last year (USD 537.3 million), it decreased by USD 73.9 million. USA.

The largest share of exports of meat products in January – December fell on meat and poultry meat offal 431.1 thousand tons (87% of total exports of meat and meat products in terms of meat), frozen beef 22, 4 thousand tons (4.5%), by-products of cattle and other animals 7.6 thousand tons (1.5%), canned meat products 3.4 thousand tons (1%), pork 2, 9 thousand tons (0.6%) and chilled beef 2 thousand tons (0.4%).

Export meat and meat products in terms of meat in January – December 2020 amounted to 487.4 thousand tons, which compared to January – December 2019 (487.7 thousand tons) less by 0.3 thousand tons, or 0.1%.

In January-December 2021, Ukraine exported meat products worth \$ 665.1 million. USA in 114 countries. In January – December 2020 –

722.4 million dollars. USA in 115 countries. The main buyers of meat products were Saudi Arabia, the Netherlands, the United Arab Emirates and Belarus, which accounted for 20.5% of the total (\$ 665.1 million) of exports, respectively (\$ 136.1 million), 14.1% (93.7 million), 8.1% (54.2 million) and 6% (\$ 40.1 million).

This year, exports of meat products to Slovakia decreased by 4.5%, Armenia by 2.6%, Vietnam – by 2.1%, Turkey – by 2.1% and Oman by 2%. At the same time, exports to Saudi Arabia increased by 7.1%, the United Arab Emirates by 3.4% and Kyrgyzstan by 1.1% and.

In January-December, 107.7 thousand tons of meat and poultry by-products (49.8% of total imports of meat and meat products in terms of meat), lard, lard and poultry fat were the most imported – 35,6 thousand tons (16.5%), pork – 28 thousand tons (12.9%), by-products of cattle and other animals – 24.3 thousand tons (11.2%) and canned meat. meat products – 6 thousand tons (4%).

Importsmeat and meat products in terms of meat in January – December 2020 amounted to 220.3 thousand tons, which is less than in 2019 (243.7 thousand tons) by 23.4 thousand tons, or by 9.6%.

In January-December 2021, meat products worth \$ 201.7 million were imported to the customs territory of Ukraine. USA from 42 countries. In January-December last year, meat products worth \$ 185.1 million were imported. USA from 33 countries. Imports to Ukraine came mainly from Poland – 38.9% (USD 78.4 million) of the total amount of imported meat products, Spain – 10.8% (21.9 million), Denmark – 9% (18,2 million), Germany – 7.9% (16 million) and France – by 6.9% (14 million USD).

In January-December 2021, imports of meat products from Germany decreased by 7.6%, Poland – by 6.4% and Hungary – by 4.7%. At the same time, during this period they increased the presence of their meat products on the Ukrainian market, from the total amount of imported products Denmark – 7%, Spain – by 4.7%, France – by 3.7% and Italy – by 1.1%

Ukraine is implementing a model for the development of the meat product subcomplex, which is based on vertically integrated industrial complexes with a full production cycle from feed mills to deep meat processing. Vertical integration is typical mainly for poultry, pig and processing enterprises, as these industries have a high level of concentration

and mechanization, which contributes to efficiency due to the scale of production in big business.

The development of integration processes in the industry, skipping the stage of contractual relations characteristic of world practice, immediately began with the most “hard” version of integration, based on the transfer of ownership and centralization of management in the hands of the integrator.

Many countries, such as European countries, do not use vertical integration due to ownership, but implement another way, based on feed mills and self-operating meat plants, and livestock farming, which provides meat processing with the necessary raw materials. The integration of farming into big business is done by concluding long-term contracts for the supply of products. In our country, small forms of management are not integrated into vertical production chains, occupying some narrow niches in the food market. The results of the agricultural holdings of the domestic meat product subcomplex fully demonstrate the realization of the benefits of large-scale production:

- availability of financial opportunities to purchase modern technologies and equipment; increasing the productivity of agricultural production; obtaining more favorable terms of credit borrowing;
- ability to influence the competitive situation due to a significant market share; possibility of delivery to large retail chains; higher activity in the implementation of innovative ways of development; opportunities to attract highly qualified specialists; availability of funds to improve working and living conditions, professional and cultural development of employees, etc. [12, p. 11].

In addition, the vertical integration of production makes it possible to provide the raw material base of meat processing in the required amount and guaranteed quality; reduce transaction costs in the form of transfer of operations from market structures to internal divisions of the enterprise; minimize logistics costs by clustering the full production cycle in a given area; to optimize the tax burden by removing taxes on intermediate products and relocating production in areas with more favorable tax conditions; reduce business risks by allocating them to different market segments and controlling the entire supply chain; by ensuring full quality control of raw materials and its comprehensive processing to expand the range, respond to changing consumer demands, increase the competitiveness of products,

reduce costs; to improve the information security of activities; solve environmental problems with the help of waste-free technologies.

As a result of the combination of these advantages there is the previously mentioned synergetic effect – the emergence of the integrated formation of new systemic properties that increase the overall effect to a value greater than the sum of the effects of participants acting alone. The advantages of large-scale production and its high resistance to adverse or unexpected changes in the external environment of the business were particularly pronounced crisis in the country's economies over the years.

At the same time, integration processes in the meat subcomplex had negative economic and social consequences. These include monopolizing the market and reducing competition, narrowing opportunities for development and displacement of small and medium-sized businesses, creating barriers to market entry; inaccessibility for small producers and owners of personal subsidiary farms of fertile lands, which have passed into the disposal of integrated structures and in some cases formed latifundia; political and economic lobbying, including in receiving state support; the emergence of contradictions in the economic interests of members of integrated formations; growth of unproductive costs for management of branched organizational structures of agricultural holdings; sharp polarization of the rural population in terms of employment opportunities and income levels, violation of the principles of traditional rural way of life, deterioration of the ecological situation in the territories of large livestock complexes, which cause protests of the local population and increase social tensions, etc. To prevent and reduce the negative impact of these phenomena, state regulation of the development of integration processes at all levels of government is needed. Currently, the state has paid attention to the most problematic and specific area of the meat product subcomplex – beef cattle. A balanced approach is needed to the development of integrated structures in this area. Due to the extended production cycle, the expediency of the existence of vertically integrated formations in it raises questions. On the other hand, it is in meat cattle breeding without the effect of scale of production that it is difficult to recoup investment costs and reduce unit costs, which are the highest in the meat industry. In foreign beef cattle breeding vertical integration is not widespread, but in our country producers face the problem of lack of agricultural outsourcing, which arose in the 1990s in pig breeding

and led to the creation of integrated structures in the industry. Perhaps an effective option would be the creation of regional cooperation centers for beef cattle breeding, the integration of small and medium-sized businesses, specialization in the cultivation and processing of standardized red beef production. which emerged in the 1990s in pig farming and led to the creation of integrated structures in the industry. Perhaps an effective option would be the creation of regional cooperation centers for beef cattle breeding, the integration of small and medium-sized businesses, specialization in the cultivation and processing of standardized red beef production. which emerged in the 1990s in pig farming and led to the creation of integrated structures in the industry. Perhaps an effective option would be the creation of regional cooperation centers for beef cattle breeding, the integration of small and medium-sized businesses, specialization in the cultivation and processing of standardized red beef production.

#### 4. Conclusions

Analysis of industry trends shows a reduction in the production of cattle, pigs, sheep, goats and horses. That is, the cultivation of these products is mostly occupied by households. Therefore, one of the problems facing the subcomplex is the reduction of volumes and unprofitable production. The situation with regard to cattle breeding is particularly difficult. This industry requires significant capital expenditures for the restoration and organization of production (restoration of breeding and commodity herds, buildings, equipment, machinery). It is established that the only industry that successfully operates and actually operates is the poultry industry, which has the features of intensive poultry technology, which provides high productivity, relatively lower labor costs and material costs per unit of output.

The increase in sales of products in general in the meat subcomplex confirms that the constant population growth in the world generates a stable demand for food. Increasing the pace of urbanization leads to a reduction in the share of the world's population capable of self-sufficiency in food, as well as contribute to the expansion of the consumer market.

It should also be noted that there is a need for a reasonable combination in the subcomplex of large agro-industrial formations, medium-sized agricultural organizations, farmers and personal subsidiary farms, which

allows to realize the benefits of each form of management, economic growth and sustainable rural development. The results of the study provide grounds to identify the following areas of effective development of integration processes and integrated structures in the meat subcomplex of the agricultural sector, which are proposed to focus on government, business, industry associations and the scientific community:

- ensuring effective access of integrated structures to the world agri-food market;
- implementation of full-scale anti-epizootic measures to combat animal diseases, especially ASF, which is a major threat to the development of pig farming;
- creation of a legal framework for property and distribution relations between members of integrated structures, including the adoption of a law on holdings;
- development of scientific and methodological support in the field of organizational and economic mechanism of integrated formations, taking into account the interests of all participants;
- organization of state statistical monitoring of the functioning of integrated structures in order to form a system of statistical indicators that comprehensively characterize their activities;
- concentration of investment activity of integrated formations on modernization of production and sales, development of selection-genetic and fodder base;
- vertical integration of producers with research structures with the creation of research and production associations in order to form an innovative direction of industry development;
- creation and expansion of contractual forms of integration, inter-organizational interactions and institutional formations;
- development of diversification of integrated formations (towards deep processing, coverage of new regions, meat cattle-breeding projects), increase of production volumes for developing market segments, increase of safety and quality of products;
- use of modern scientific and methodological support of corporate strategic management, business process and quality management, marketing;
- state regulation of the activities of integrated structures, including through the improvement of land legislation in order to reduce the negative

impact on the competitive environment, environmental situation, socio-economic situation in rural areas;

– strengthening attention to corporate social responsibility of agro-industrial integrated formations, solving their social problems;

– development of mechanisms of public-private partnership in the creation of integrated structures in the “growth points” and the implementation of integrated formations of large investment projects.

### References:

1. Salkova I. Y., Fushtei L. L. (2018) Theoretical bases and possibilities of development of meat product subcomplex of Ukraine. *Economics and management of the national economy*, issue 22, pp. 226–230.

2. Kernasyuk Yu. V. (2020) How to ensure the profitability of livestock. *Agribusiness today*, no. 20 (435), pp. 12–18.

3. State Statistics Service of Ukraine. Available at: [http://www.ukrstat.gov.ua/druk/publicat/kat\\_u/publ7\\_u.htm](http://www.ukrstat.gov.ua/druk/publicat/kat_u/publ7_u.htm)

4. Palapa N. V., Pron B., Ustimenko O. V. (2016) Industrial livestock: environmental and economic consequences. *Balanced nature management*, no. 3, pp. 64–67.

5. Kishchak I. T., Korneva N. O., Novikova O. E. (2015) Livestock of Ukraine in the world branch development. *Bulletin of Agrarian Science of the Black Sea Coast*, vol. 3. pp. 10–21.

6. Shestakova P. Yu., Ozhelevskaya T. S. (2018) The agricultural market of Ukraine in the context of European integration. *Young scientist*, no. 3(2), pp. 720–722.

7. Dorosh M. M. (2019) Poultry farming of Ukraine: current status, problems and prospects of development. *Scientific Bulletin of Lviv National University of Veterinary Medicine and Biotechnology*. Gzhytsky, t. 16, no. 1(2), pp. 7–17.

8. Shpikulyak O. G., Ignatenko M. M., Shvets A. A. (2021) Conceptual assessments of the implementation of the principles of inclusive development of rural areas with the participation of agro-holding integrated formations. *Economics of agro-industrial complex*, no. 3, pp. 97–111.

9. Pidgrebelna M. (2013) Agroholdings as large-scale enterprises in agrarian business. *Bulletin of Lviv National Agrarian University. Series: Economics of agro-industrial complex*, no. 20(1), pp. 101–108.

10. Pavlov O. I. (2020) Inclusive development of agricultural holdings in the food security system of Ukraine. *Economics and management of agro-industrial complex*, no. 2, pp. 64–72.

11. Skupsky R. M., Melikh T. G. (2016) Food industry: aspects of research of modern problems and development trends. *Bulletin of KhNAU. Series: Economic Sciences*, no. 2, pp. 335–347.

12. Lupenko Yu. O., Kropivko M. F. (2014) Agricultural holdings in Ukraine and strengthening the social orientation of their activities. *Exchange market monitoring*, no. 7, pp. 8–18.



13. Fushtei L. L. (2019) The current state of development of the meat product subcomplex of Ukraine. *Regional business economics and management: scientific, industrial and practical journal*, no. 1, pp. 50–55.

14. Pucenteilo P. R. (2012) The development of integration relations is a factor in increasing the competitiveness of livestock enterprises. *Bulletin of Sumy National Agrarian University*, no. 8(53), pp. 57–62.

15. Boltovska L. L. (2021) Organizational and economic principles of management of dynamic processes of the meat product subcomplex: dis. for the degree of Doctor of Philosophy in Economics: 051. Vinnytsia, 189 p.

16. A practical guide for meat exporters. Available at: <https://regionet.org.ua/files/Meat20direc-tory20for20exporter1.pdf>

17. European Green Course: Opportunities and Threats for Ukraine. DiXi Group 2020 Institute for Economic Research and Policy Consulting and Analytical Center. P. 24–27. Available at: <https://rpr.org.ua/news/yevropeys-kyy-zelenyy-kurs-mozhlyvosti-ta-zahrozy-dlia-ukrainy>

18. Pucenteilo P. R. (2011) Estimation of competitiveness of the beef market. *Sustainable economic development*, no. 5(8), pp. 205–215.

19. Demyanenko S. I. (2004) Agrarian policy of Ukraine and its strategy: directions of development. *Offer*, no. 7, pp. 24–28.

20. Small Farmers and Households in Agriculture and the Rural Economy: Assessing Their Role and Measures to Support Their Sustainable Development. Available at: <https://kse.ua/wp-content/uploads/2021/07/Smallholders-KSE.pdf>