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Economic aspects of production of livestock products in agricultural enterprises

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The subject of research is the scientific and practical aspects of livestock production in Ukraine. The purpose of the article is to determine the economic principles of livestock production in agricultural enterprises. The data of the State Statistics Service of Ukraine, the results of research by scientists and our own developments were used. The following methods of scientific research were applied: abstract-logical, monographic, statistical-economic and systematic approach.

Trends in production were established in three strategically important subsectors of livestock farming in the agrarian formations of Ukraine: poultry farming, pig breeding and cattle breeding. Based on the analysis, it was found that the production of livestock products in agricultural enterprises is a specialized area and is concentrated mainly in large and medium-sized livestock complexes.

To solve the problematic issues of agribusiness development in Ukraine, which are related to logistics and sales of agricultural products on foreign markets, the need to diversify the directions of production in agricultural enterprises through the combination of crop production and more labour-intensive livestock and processing production units were confirmed. This will make it possible to reduce production risks and seasonality of labour, to increase the wage funds in enterprises, etc.

Based on the analysis of the impact of technological factors on the economic efficiency of livestock production in agricultural enterprises, the need for intensification of production through improving the feed base and organizing breeding work, optimizing the turnover and reproduction of the main livestock of livestock and poultry during the year, etc., were substantiated. For the effective development of livestock in agricultural enterprises, it is necessary to improve marketing and sales activities, organization and motivation personnel.

Key words: livestock products, agricultural enterprise, production specialization, production diversification, efficient production, production intensification, labour organization.

Problem statement and analysis of recent research. Livestock production in the agricultural formations of any country in the world is the object of its agricultural and food policy. This issue is given special attention by various international institutions (UN, FAO,

EU and other international organizations and associations of states) in order to prevent significant volatility of price fluctuations, supply volumes on the world consumer food market, etc. The state of livestock production is especially relevant for ensuring and supporting

the food security of each country, since it determines the satisfaction of the primary needs of the population in food products with a high content of proteins (proteins, essential amino acids), necessary for the normal functioning of the human body. In Ukraine, despite the almost three-year war with the Russian Federation and the occupation of part of the territories, livestock production continues, which has great potential for increasing its volumes for corresponding supplies to the domestic and foreign agricultural markets. Therefore, scientific research on the justification of promising directions for the effective production of the main types of livestock products in agricultural enterprises, which remain the main employers in rural areas, is relevant in the current difficult period of development of Ukraine.

Many scientific works of scientists are devoted to the problems of the agricultural market development, the formation of the livestock supply of products and the efficiency of its production. Thus, the importance of regulating the functioning of the logistical agri-food supply chains of meat products by producers for meat processing enterprises is proven by scientists Kopytets N.G. and Voloshin V.M., who insist on increasing the share of producers' participation by concluding fair contracts with meat market participants, creating service cooperatives and other associations, operating a network of wholesale markets and short supply chains, etc. [1]. Taking into account the price factor, poultry farming is more profitable for producers, where there is a rapid turnover of capital and an increase in the population's demand for dietary poultry meat and eggs. Vertical integration in poultry farming from feed production to product sales ensures the efficiency of production [2]. Having conducted a SWOT analysis of the development of poultry farming in enterprises that suffered from the war with the Russian Federation, scientist Avercheva N.O. identified its strategic directions, in particular, the use of resource-saving technologies, expanding the range of products produced and improving their quality, activating integration ties with service, processing, and trading enterprises, attracting investment and credit resources to the poultry farming subsector [3].

Researcher Pavlenko O.S., taking into account the global increase in demand for agricultural products, has identified scientific and practical approaches to decarbonization of the livestock industry, which include biogas production, improving animal feeding rations, genetic editing, etc. Among the sub-sectors of

livestock farming, cattle breeding has the most negative impact on the environment, while other sub-sectors have a lesser impact [4]. The importance of intensification of livestock farming for ensuring effective production is proven by scientist Shiyan N.I. Having conducted a grouping of farms, she determined the maximum costs per head of livestock in meat and dairy cattle breeding, at which the best indicators of management efficiency in enterprises are ensured [5]. Researchers Svinous I.V. and others argue that information support for planning and management in dairy cattle breeding enterprises will lead to its more effective development. They also assign a large role to material incentives for production personnel on livestock farms to increase labor productivity [6].

Scientists Zainchkovsky A.O., Kryvun M.V., studying the economic mechanism of relations between participants in the dairy market, established the scale of the decrease in demand and supply indicators and proposed directions for the development of mutually beneficial relations between dairy and agricultural enterprises (dynamics of milk purchase prices, quality monitoring, etc.) [7]. In continuation, scientists Kalinchyk M.V. and others argue that the problems of milk production should be solved comprehensively in the chain of «production-processing-sale». Harmonization of economic relations between participants in integrated production in the dairy subcomplex is required, which involves the coordination of prices, an increase in the volume of milk-raw material production to increase the capacity utilization of dairy enterprises with further state support [8]. Researcher Stepasyuk L.M. substantiated the directions of organizing milk production and processing, in particular through cooperation of households and the creation of family dairy farms to increase the volume of production and improve its quality. Attention is also drawn to the continuation of state subsidies and the provision of various grants for the development of entrepreneurship in dairy farming [9]. In the meat product sub-complex, in order to avoid price disparities between counterparties, production and economic relations should be based on coordinated cooperation at the stages of raw material production, its processing, consumption of finished products, as well as the creation of integrated production units, etc. [10].

In the context of agrarian economy globalization, it is also worth considering the results of research by foreign scientists who study various aspects of effective production of livestock products in agrarian units. Thus,

Italian scientists Cerrato M. and others conducted a thorough study of the economic and environmental sustainability of livestock development. As a result of comparing different sub-sectors of livestock farming, it was proposed to continue subsidizing family farms, which play an important role in investing in livestock production, ensuring the development of entrepreneurship and local communities in rural areas, etc. [11]. In this perspective, Chinese scientists Cheng M. and others have concluded that to meet the growing demand for livestock products, it is necessary to intensify the corresponding production, pursuing the effective use of available resources and agricultural space for conducting agribusiness. To provide information on the economic and ecological state of development of livestock sub-sectors and its control, scientists have developed a model for mapping the corresponding production systems on the territory of the state [12].

Thus, in the works of scientists, considerable attention is paid to the economic aspects of the development of livestock sub-sectors in enterprises, the development of the market for meat and milk, eggs, etc. Summarizing the above, it can be noted that the production of livestock products allows to provide a large part of the range of food products necessary for consumption by the population. And in the face of permanent non-economic challenges due to climate change, epidemics, neighborhood with hostile Russia, etc., it is necessary to determine conceptual directions for ensuring effective production of livestock products in agricultural enterprises of Ukraine in the current and near future periods.

The aim of the research is to substantiate the economic principles of livestock production in agricultural enterprises of Ukraine based on the analysis of their economic activity indicators over the past years.

Important scientific and practical tasks of the study are: 1) establishing the scale of livestock production and relevant export-import operations in Ukraine; 2) analysis of economic indicators of livestock production in agricultural enterprises; 3) substantiation of conceptual directions of effective livestock production in agricultural enterprises.

Material and methods of research. In the process of scientific research, statistical data of the State Statistics Service of Ukraine, results of scientific research of Ukrainian and foreign scientists, own scientific and practical developments were used. The methodological tools of the research include general scientific and

special research methods, in particular: abstract-logical (to substantiate the main provisions and conclusions); monographic (taking into account the results of research by scientists in this area of research); statistical-economic (to construct series of dynamics, comparisons, correlation-regression analysis), systemic approach (to substantiate promising directions of ensuring the production of livestock products in the war and post-war periods), etc.

Research results and discussion.

Agricultural production provides humanity with essential commodities and thereby forms the food security of each state. This is given great attention by many international institutions in order to prevent significant price jumps in the world and national agri-food markets. Since the introduction of martial law in Ukraine in February 2022, the further development of Ukrainian agriculture, in particular the production of livestock products, has been increasingly discussed in academic circles, among practitioners, and representatives of state and local authorities. After all, the logistics chains for the sale of crop products have been disrupted in the country, a large part of which is exported. Therefore, in order not to lose Ukraine's agricultural potential and increase the volume of added value and the number of jobs in rural areas and in related types of economic activity (food and processing industry, transport, trade, etc.), it is worth developing livestock production units in agricultural enterprises.

In the controlled territory of Ukraine, agribusiness continues to be conducted, crops are grown, and livestock and poultry are kept. Therefore, by developing the livestock subsector in agricultural holdings, it is possible to increase their gross income, wage funds with the corresponding motivating bonus part, the level of wages and the absolute amount of labor income, pay more taxes and fees to the state and local budgets and thereby help fill them to continue financing the state's defense capability.

In the pre-war period (2018-2021), the production of agricultural products in actual prices in general, in particular in enterprises, gradually increased in the state. The latter are the main producers of agricultural products, as they provide about 2/3 of its total gross production in Ukraine (Table 1).

However, due to the occupation of part of the state's territories and inflationary processes, the output of agricultural products in comparable 2016 prices for 2018-2022 decreased slightly - to UAH 534.4 billion, or by 20.4%. At 2016 prices, the total volume of agricultural products

in Ukraine produced by enterprises at the end of 2022 amounted to UAH 348.4 billion, including livestock products, which accounted for only 18.7%. Taking into account the production and resource potential of the state (natural and climatic conditions, natural pastures, fodder base, human resources and scientific and educational system for training specialists and specialists), the potential additional demand within and outside the state, such an indicator of gross production of livestock products is too small for Ukraine.

Over the past few decades, the following specialization of farms for the production of livestock products has developed in the state. In absolute terms, enterprises produce the following types of products more: poultry meat, eggs, pork, milk and to a lesser extent beef and veal (Table 2). This main list of livestock products is the production results, respectively, of the following important sub-sectors of the agricultural sector of the economy, such as poultry farming, pig farming and cattle breeding.

Table 1 – Agricultural production volumes in Ukraine

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Agricultural output in actual prices, billion UAH	847,6	842,8	892,9	1366,5	1073,9	226,3
Including agricultural enterprises, %	62,8	63,1	63,4	68,0	65,9	3,1
Agricultural output at constant prices in 2016, billion UAH	671,3	681,0	612,1	712,6	534,4	-136,9
Including, % Crops	78,9	79,1	77,3	81,4	78,2	-0,7
Livestock	21,1	20,9	22,7	18,6	22,8	1,7
Output of agricultural products by agricultural enterprises at constant prices in 2016, billion UAH	438,0	449,8	395,7	484,1	348,4	-89,6
Including, % Crop production	83,9	83,8	81,7	85,3	81,3	-2,6
Livestock	16,1	16,2	18,3	14,7	18,7	2,6
Share of livestock products of agricultural enterprises in gross livestock production, %	47,5	51,3	52,3	53,7	56,1	8,6

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [13-16].

Table 2 – Volumes of livestock production in agricultural enterprises, thousand tons

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Meat of farm animals (in slaughter weight)	1533,6	1697,9	1704,0	1720,4	1608,1	74,5
Including: beef and veal	93,7	101,7	84,8	77,9	80,7	-13,0
Pork	400,3	384,8	385,1	431,9	407,4	7,1
lamb and goat meat	0,6	1,2	1,3	1,2	0,6	0,0
poultry meat	967,7	1209,7	1232,2	1208,5	1118,7	151,0
Rabbit	0,9	0,5	0,6	0,7	0,7	-0,2
Horsemeat	0,2	0,0	0,0	0,2	0,0	-0,2
Milk	2755,5	2728,6	2761,2	2767,7	2644,2	-111,3
Eggs, million pcs	8900,3	9357,6	8913,5	7012,8	5786,1	-3114,2
Wool, t	236	200	146	151	94	-142,0
Honey, t	890	787	655	685	576	-314,0

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [13-16].

Among the main types of public sector livestock products of the agrarian economy, on the basis of which the largest sales batches on the domestic and foreign agricultural markets or for further processing are formed at domestic enterprises of the food and processing industry, the following are received (2022): poultry meat (89.3%), pork (61.8%), eggs (48.5%). A smaller share in the total production of livestock products is occupied by enterprises under the following commodity positions: beef and veal - only 30.1%, milk - 34.0%, etc. (Table 3).

Thus, the traditional sub-sectors of animal husbandry in Ukraine: poultry farming, pig farming and cattle breeding can be considered strategic, since they significantly affect the current food security of the state, financial and economic indicators of agricultural enterprises, labor incomes of the population, development of rural areas and communities, etc. These include, first of all, poultry farming of meat and egg directions, meat pig farming and dairy cattle breeding. The data confirm that such goods as chicken meat and eggs, dairy products, beef and veal constitute the basis of export supplies of livestock products of Ukraine (Table 4), therefore there are prospects for increasing the volumes of production and export of these types of agricultural products in view of the gradual increase in the population in the world, in particular in Asia and Africa, and globalization integration processes in the world economy, in particular on the European continent.

Ukraine remains a permanent and important trading partner for the sale of agricultural products abroad, even during the war period. And this is of particular importance for balancing the state's external trade balance, stabilizing the currency exchange rate and reducing inflationary processes. After all, about half of Ukraine's exports abroad are occupied by agricultural products. However, during the years under study, domestic agricultural producers failed to ensure a significant increase in the export of animal products. Thus, in the export of agricultural products from Ukraine, only 5-6% are products of animal origin. In the future, it is worth establishing logistical schemes for the export of not only crop, but also livestock products and finished products from them thanks to the liberalization of the customs policy of many European and foreign countries. Ukraine exports, unfortunately, mainly agricultural raw materials. The development perspective of strategically important sub-sectors of livestock breeding and processing industries in agricultural enterprises of Ukraine still lies in the need for import substitution of products of animal origin. After all, in the structure of a small volume of imports of agri-food products in 2018-2022, livestock products account for about 1/5, in particular, in 2022 3.5% - meat, 10.4% - fish, 4.1% - dairy products, 2.4% - meat and fish products, etc. (Table 5).

Table 3 – Share of livestock production in agricultural enterprises in gross production in Ukraine, %

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Meat of farm animals (in slaughter weight)	65,1	68,1	68,8	70,6	72,9	7,8
Including:						
Beef and veal	24,4	27,5	24,6	25,1	30,1	5,7
Pork	51,2	54,3	55,2	59,7	61,8	10,6
Mutton and goat meat	6,3	8,6	11,3	9,8	5,6	-0,7
Poultry meat	86,2	87,6	87,7	88,0	89,3	3,1
Rabbit meat	4,9	4,3	5,3	6,4	7,6	2,7
Horse meat	0,0	0,0	0,0	2,8	0,0	0,0
Milk	27,4	28,2	29,8	31,8	34,0	6,6
Eggs, million pcs	55,2	56,1	55,1	49,8	48,5	-6,7
Wool, t	12,4	11,5	9,3	10,1	7,6	-4,8
Honey, t	1,2	1,1	1,0	1,0	0,9	-0,3

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [13-16].

Table 4 – Data on exports of agri-food products of animal origin from Ukraine

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Exports of goods, billion USD	47,3	50,1	49,2	68,1	44,1	-3,2
Including: agri-food products, %	39,3	44,1	45,1	40,7	53,0	13,7
agri-food products, billion USD	18,6	22,1	22,2	27,7	23,4	4,8
Including: Animal products, %	6,5	5,8	5,4	4,9	6,3	-0,2
of which: meat and edible offal	3,5	3,8	2,9	3,1	3,9	0,4
fish and crustaceans	0,1	0,2	0,2	0,1	0,2	0,1
milk and dairy products, poultry eggs; honey	2,6	2,0	1,9	1,4	1,9	-0,7
Fats and oils of animal or vegetable origin	24,2	21,4	25,9	25,4	25,4	1,2
Ready-made food products	16,2	14,5	15,2	13,7	10,7	-5,5
of which: meat, fish products	0,1	0,1	0,1	0,1	0,1	0,0
various food products	0,7	0,6	0,7	0,6	0,5	-0,2

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [13-16].

Table 5 – Data on imports of agri-food products of animal origin into Ukraine

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Imports of goods, billion USD	57,2	60,8	54,3	72,8	55,3	-1,9
Including: agri-food products, %	8,8	9,4	12,0	10,6	10,9	2,1
agri-food products, billion USD	5,1	5,7	6,5	7,7	6,0	0,9
Including: Products of animal origin, %	18,2	18,7	19,4	20,6	19,5	1,3
of which: meat and edible offal	3,3	2,8	2,5	2,8	3,5	0,2
fish and crustaceans	10,9	11,2	10,5	11,3	10,4	-0,5
milk and dairy products, poultry eggs; honey	2,1	3,0	4,7	5,0	4,1	2,0
Fats and oils of animal or vegetable origin	5,3	4,4	4,3	5,7	4,9	-0,4
Ready-made food products	46,3	45,6	45,7	46,2	43,8	-2,5
of which: meat, fish products	1,9	2,2	2,5	2,5	2,4	0,5
various food products	8,1	7,7	7,5	7,2	6,9	-1,2

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [13-16].

It can be noted that within the state, it is necessary to comprehensively support and promote the development of primary and deep processing of agricultural products of animal origin. This will contribute to an increase in the volume of added value in the production of agro-food

products, and, consequently, an increase in demand for labor (creation of additional jobs, stimulation of the development of entrepreneurship in animal husbandry) and labor income of the population, saturation of the domestic food market with domestic products of animal origin.

As for production characteristics, the majority of the total cattle population of agricultural enterprises of Ukraine in 2022 was kept mainly in medium and large livestock complexes of enterprises, where the herd numbers 100-499 heads. (505 enterprises), 500-999 heads. (294), more than 1000 heads. (273 enterprises). A similar situation is observed with the number of cows, since in Ukraine there is an acceptable level of profitability of running a dairy business. The majority of the cow population is also concentrated in medium and large livestock complexes of enterprises that keep cows, forming their herd with a number of 100-499 heads. (614 enterprises), 500-999 heads. (140) and more than 1000 heads. (74 enterprises).

According to the grouping of agricultural enterprises by pig population, the largest number of them is concentrated in large specialized pig complexes, where on average one such farm keeps more than 10000 heads. (63 enterprises), as well as with a pig population from 1000 to 9999 heads. (252 enterprises). As for poultry farming, in Ukraine 85% of the existing poultry population of enterprises is concentrated in highly specialized poultry farms with a population from 100000 to 499999 heads. (48 enterprises) and more than 500,000 heads. (28

enterprises). Since poultry farming is a high-tech and capital-intensive type of production, such enterprises are mainly located near large cities to quickly meet the consumer demand of the population [15-16].

The livestock population in agricultural enterprises at the end of 2022 was only 942.2 thousand heads, including 394.2 thousand heads. cows. Unfortunately, throughout the entire period under study, there is a negative trend towards a decrease in the livestock population (by 17.2%), including cows (by 15.7%) (Table 6). A similar situation occurs with the pig population, which decreased by the end of 2022 to 3,144.6 thousand heads., as well as poultry (chickens) - 101.8 thousand heads.

The share of livestock and poultry of agricultural enterprises in the structure of the total livestock of agricultural formations of Ukraine is: pigs and poultry - about 60%, cattle - about 40%, cows - only up to 30% (Table 7). This indicates that rural households have accumulated significant potential for the development of dairy and meat livestock, which should be used and supported by state and local authorities to form small forms of agribusiness in rural areas for the production, primary and deep processing of livestock products.

Table 6 – Livestock in agricultural enterprises, thousand heads

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Cattle	1138,1	1049,5	1008,4	1003,4	942,1	-196,0
including cows	467,8	438,6	423,9	424,6	394,2	-73,6
Pigs	3395,6	3300,1	3629,5	3576,9	3144,6	-251,0
Sheep and goats	182,3	168,6	151,3	168,5	140,8	-41,5
Horses	14,2	14,2	10,8	9,4	8,7	-5,5
All types of poultry	118812,9	127773,2	109737,0	113478,9	101819,6	-16993,3
including chickens and roosters	115280,8	125837,4	107901,8	111706,0	99623,2	-15657,6

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [15-16].

Table 7 – Share of livestock of agricultural enterprises in the total livestock and poultry in Ukraine, %

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Cattle	34,1	33,9	35,1	38,0	40,8	6,7
including cows	24,4	24,5	25,3	27,5	29,1	4,7
Pigs	56,4	57,6	61,8	63,8	63,5	7,1
Sheep and goats	14,4	14,0	13,3	15,4	15,0	0,6
Horses	5,8	5,5	5,3	5,2	5,5	-0,3
All types of poultry	56,1	58,0	54,7	56,1	56,4	0,3
including chickens and roosters	60,1	62,1	58,8	59,9	60,2	0,1

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [15-16].

Thus, for a long time now, three areas of specialization in the production of livestock products have been identified in the agricultural sector of the economy. First of all, these are poultry products (meat and eggs of chickens), pig farming (pork) and dairy farming (milk, beef and veal). Given the difficult situation with the logistical mechanisms for exporting crop products abroad during the period of martial law and the expected post-war recovery in Ukraine, it is necessary to pay attention to adjusting and focusing areas of agrarian policy support on the production of beef and veal, milk, which is currently more concentrated in households and is based on primitive technologies. Livestock farming should be developed in many agricultural enterprises as a direction of diversification of agribusiness, which will ensure a reduction in product sales risks, increase the number of jobs for the rural population of Ukraine, and reduce the seasonality of agricultural work. Thus, we will have positive economic and social effects from the combined development of crop and livestock units in agricultural enterprises. In turn, this will ensure the social directions of development of rural communities (employment of the population, its motivation and labor income, development of farming, tax revenues to local budgets of territorial communities, etc.).

Production indicators of livestock and poultry farming in agricultural enterprises are presented in Table. 8.

livestock and poultry in enterprises, optimize the optimal turnover and reproduction of the main herd of livestock and poultry, feed base in terms of quality and cost of production, and thus ensure an increase in the technological efficiency of livestock production. In farms, it is necessary to carefully calculate optimal feed rations, conduct alternative calculations using various combinations of feed types, effective means of preventing and treating animal and poultry diseases, skillfully apply relevant innovative technical and technological solutions, etc. Such conclusions are confirmed by the assessment of the closeness of the factors relationship influencing the economic indicators of livestock production in agricultural enterprises using correlation analysis.

For the reliability of the analysis and the reliability of the initial data for calculating the correlation coefficients (r) and determination, indicators of livestock development in agricultural enterprises of the regions of Ukraine, except for the temporarily occupied ones: Kherson, Zaporizhzhia, Donetsk and Luhansk and the Autonomous Republic of Crimea, which are given in the statistical collections of the State Statistics Service of Ukraine [15-16]. Thus, among the most influential factors on the efficiency of production - the cost value of livestock products obtained in agricultural enterprises (thousands of UAH/ha) were the following: 1) the resulting offspring per 100 cows, head (correlation coefficient $r=0.4551$); 2) the consumption of concentrated

Table 8 – Production indicators of livestock and poultry farming in agricultural enterprises

Indicator	Year					2022/ 2018, ±
	2018	2019	2020	2021	2022	
Slaughter weight of agricultural animals, kg 1 head: CATTLE	222	229	228	224	225	3,0
Pigs	77	80	81	82	82	5,0
Sheep and goats	19	19	20	21	18	-1,0
Horses	214	257	277	272	234	20,0
Poultry	1,8	1,9	1,8	1,8	1,8	0,0
Milk yield from 1 cow, kg	6190	6101	6634	6863	6611	421,0
Livestock yield per 100 cows, head	67	64	66	67	65	-2,0
Livestock yield per 100 sows, head	2181	2126	2352	2177	2340	159
Wool sheared from 1 sheep, kg	1,5	1,5	1,5	1,6	1,2	-0,3

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [15-16].

In recent years, Ukraine has been tracking the same level of fattening indicators of animals slaughtered for meat and meat products, as well as milk yields and offspring in livestock farming, the wool shearing rate per 1 sheep is deteriorating. To increase the productivity of livestock and poultry, it is necessary to improve: breeding work with

feeds, c. feed units per 1 head of livestock ($r=0.4184$); 3) consumption of concentrated feed, c. feed units per 1 c. of live weight gain of cattle ($r=0.3606$); 4) offspring obtained per 100 sows, head ($r=0.2972$); 5) consumption of concentrated feed, c. feed units per 1 c. of milk ($r=0.2712$); 6) consumption of concentrated feed, c. feed units

per 1 c. of live weight gain of pigs ($r=0.2140$), etc. In addition, in dairy cattle breeding of agricultural enterprises, the most influential factors for obtaining higher milk yields from 1 cow (kg) were: 1) consumption of concentrated feed, c. feed units per 1 standard head of livestock (correlation coefficient $r=0.7014$), consumption of all feeds, c. feed units per 1 standard head of livestock ($r=0.4930$); 3) the resulting offspring per 100 cows, heads ($r=0.4802$).

For reference: feed consumption per one conditional head of livestock is the ratio of the total mass of feed spent on feeding farm animals of all species to their average annual conditional livestock. The conditional livestock of farm animals is defined as the sum of the products of the number of farm animals by sex and age groups and the corresponding conditional livestock coefficients. The conditional livestock coefficients are: for cows, breeding bulls of the dairy herd, buffaloes, horses, working oxen - 1.0; other cattle - 0.6; pigs - 0.3; sheep and goats - 0.1; poultry of all species - 0.02 [15-16].

The conducted correlation-regression analysis of the influence of factors on the effective characteristic ($r=0.7555$) and these factors among themselves to determine the levels of multicollinearity allowed us to select the most influential factors on the level of economic efficiency of livestock production in agricultural enterprises based on the general production indicators of livestock in agricultural enterprises of the regions of the state. Thus, a close relationship is observed between the volumes of livestock production in agricultural enterprises in the controlled regions of Ukraine (yh, thousand UAH/ha) and the following six factor indicators:

$$y_x = -115,66 + 9,93 x_1 + 5,49 x_2 + 462,79 x_3 + 2,52 x_4 + 60,51 x_5 + 0,07 x_6, \quad (1)$$

where x_1 – consumption of concentrated feeds, c feed. units. per 1 head of livestock; x_2 – consumption of concentrated feeds, c feed. units. per 1 c of live weight gain of cattle; x_3 – consumption of concentrated feed, c feed units per 1 c of milk; x_4 – offspring, head. per 100 cows; x_5 – consumption of concentrated feed, c feed units per 1 c of live weight gain of pigs; x_6 – offspring, head. per 100 sows.

Thus, to increase the economic efficiency of livestock production in agricultural enterprises, more attention should be paid to the technological process of feeding cattle and poultry, the formation of the optimal structure of their food ration, a cheaper and higher-quality feed base, so that livestock farming develops on an intensive basis. Much attention should be paid to breeding work in livestock farming in order to obtain healthy

and highly productive reproductive livestock of cattle, pigs and poultry, etc.

In agricultural enterprises, with the beginning of the Russian-Ukrainian war, the general situation in terms of financial and economic indicators of agricultural enterprises has deteriorated somewhat. Thus, agribusiness remains profitable in 79.1% of agricultural enterprises in 2022, and the overall level of profitability of agricultural enterprises is 14.1%, and operating activities - 21%. The most profitable, as evidenced by the latest data of the State Statistics Service of Ukraine on the profitability of agricultural production, remains the cultivation of grain crops, sunflower and other plant products. While various types of livestock products, except for milk, have low profitability indicators, and sometimes unprofitable [15].

One of the reserves for improving the financial and economic indicators of livestock farming of agricultural enterprises is the improvement of marketing and sales activities. It is necessary to actively monitor the prices of agricultural products of counterparties (food and processing enterprises) and carry out appropriate sales in a more favorable period and to reliable (verified) buyers, avoiding large amounts of receivables. To do this, it is necessary to analyze the dynamics of fluctuations in the purchase prices of raw livestock products by food and processing enterprises during all months of the calendar year for the last 3-5 or more years and determine the best periods for slaughtering animals and poultry for meat, selling milk, and eggs. Thus, according to the analysis of fluctuations in the prices of livestock products sold by agricultural enterprises during the calendar year, it will be most profitable from a financial point of view for them to ensure the sale of live animals for slaughter to meat plants during July-December, milk to dairies - September-February, eggs - September-March (Table 9).

Lower prices for livestock products in other months of the calendar year are explained by an increase in the supply of agri-food products of animal origin on the market from small producers - rural households. With this economic principle, conducting agribusiness requires coordination of the technological professional work of the enterprise's specialized zootechnical service when planning the turnover of livestock and poultry in the production and technological process during the calendar year. This approach should be taken into account when forming a plan for the turnover of the main (fattening) herd of the corresponding livestock and poultry, so that a greater yield of livestock products falls on those parts of the year when product prices are above the average annual prices.

Table 9 – Average ratios of sales prices of livestock products by enterprises to average annual prices for 2018-2022, %

Month	Type of livestock product		
	Animals (live weight)	Milk	Eggs
January	94	101	111
February	95	100	100
March	97	99	103
April	96	97	91
May	96	95	80
June	99	94	75
July	100	95	79
August	105	97	90
September	107	101	101
October	105	105	118
November	99	107	112
December	108	109	140

Source: compiled and calculated based on data from the State Statistics Service of Ukraine [15].

Livestock plays a significant role in providing the population with food, and also supplies raw materials for food industry enterprises. The efficiency of livestock production can be increased by implementing various innovative solutions in the technique and technology of producing high-quality products, as well as the organization of labor of livestock farm personnel, which consists in improving working conditions, work and rest regimes, equipping and servicing workplaces, optimizing the salary structure through the use of various supplements and allowances, material assistance, bonus payments depending on the quantitative and qualitative indicators of the obtained livestock products, etc. One of the main areas of scientific labor organization in livestock complexes of enterprises is labor rationing [17-20], its tariffication [21], which ensures the effective use of human resources, staffing and the necessary need for qualified specialists in zootechnical and veterinary services of enterprises, production personnel: livestock breeders, machine operators, drivers, etc. For the most objective and reliable calculation and/or clarification of the necessary need for relevant employees, determination of tariff categories of work to pay for their work, it is necessary to apply scientific and methodological provisions of labor rationing in sub-sectors of livestock farming, which are developed and updated taking into account the modernization of livestock complexes by researchers of the Ukrainian Research Institute of Agro-Industrial Complex Productivity.

Their application will allow for a correct approach to the calculation of livestock and poultry maintenance standards, number standards for production personnel and technological specialists of specialized services. And further work tariffing for livestock farmers will allow for a fair differentiation of the level and optimization of the salary structure for employees of agricultural enterprises livestock complexes.

Conclusions. The scale, specialization and concentration of production by agricultural enterprises in three strategically important sub-sectors of animal husbandry have been established: poultry farming, pig farming and cattle breeding. Up to 70% of gross agricultural output in Ukraine is produced by enterprises, which in 2022 amounted to UAH 348 billion in comparable prices of 2016, including the share of livestock products was only 19%. Large and medium-sized livestock complexes in agricultural enterprises produce mainly raw materials of animal origin, and therefore require an increase in the capacity of its primary and deep processing to increase the volume of added value in rural communities to create new jobs, increase labor incomes of the population and import substitution of products of animal origin.

The production of domestic livestock products is oriented more towards the domestic consumer market. After all, in recent years, livestock products have occupied only 5-6% in the structure of agricultural exports from Ukraine. However, given the potential demand

on the world food market, there are conditions for increasing the production volumes of the specified products. The modern development of livestock farming in agricultural enterprises is concentrated in specialized farms. This is most evident in poultry and pig farming, and cattle breeding is concentrated in large and medium-sized livestock complexes of enterprises.

A promising direction for ensuring effective production of agricultural products is the diversification of agribusiness within agricultural enterprises, in particular through the combination of crop and livestock divisions through the increase in production capacities in certain strategic sub-sectors of livestock farming, as well as the processing of livestock products in agricultural enterprises. This will ensure a reduction in risks related to the sale of certain types of crop products on the domestic and foreign agricultural markets.

The correlation-regression analysis conducted allowed us to determine the factors influencing the efficiency of livestock production, in particular, these are measures to intensify livestock production through improving the feed base and feed costs for livestock and poultry, breeding work, etc. To increase the efficiency of livestock production in enterprises, it is necessary to improve the technical equipment of livestock production and the appropriate organization of labor, in particular through methodically correct labor rationing and clarification of need quantitative indicators for production personnel of livestock farms, as well as specialists of specialized zootechnical and veterinary services of enterprises.

One of the reserves for improving the financial support of the economic activities of agricultural enterprises is the improvement of marketing and sales activities. It is necessary to monitor prices and detect their fluctuations in the domestic and foreign agricultural markets in order to determine the best periods and planned volumes of agricultural products sales at more favorable prices and ensure an increase in the profitability of the production of various types of livestock products in agricultural enterprises. Revenue from the sale of livestock products to enterprises can be increased if the zootechnical services of enterprises, when planning and coordinating the turnover of the herd of the animals corresponding species and poultry, ensure a greater output of products in those months of the year when higher sales prices are observed.

A logical continuation of scientific economic research will be the issue of the development of livestock farming individual sub-sectors

in agrarian formations: poultry farming, pig farming, cattle breeding, sheep breeding, etc. - and the determination on this basis of relevant scenarios and promising directions for their development in the conditions of martial law and/or the post-war period in Ukraine.

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Економічні засади виробництва продукції тваринництва в сільськогосподарських підприємствах

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Предметом дослідження є науково-практичні аспекти виробництва продукції тваринництва в Україні. Метою статті є визначення економічних засад виробництва продукції тваринництва в сільськогосподарських підприємствах. Використано дані Держстату України, результати досліджень учених та власні розробки. Застосовано наступні методи наукового дослідження: абстрактно-логічний, монографічний, статистико-економічний і системний підхід.

Встановлено тенденції виробництва продукції у визначених трьох стратегічно важливих підгалузях тваринництва аграрних формувань України: птахівництві, свинарстві й скотарстві. На основі проведеного аналізу виявлено, що виробництво тваринницької продукції в сільськогосподарських підприємствах є спеціалізованим напрямом і сконцентрований переважно у великих і середніх тваринницьких комплексах.

Для вирішення проблемних питань розвитку агробізнесу в Україні, які пов'язані з логістикою і збутом сільськогосподарської продукції на зовнішніх ринках, підтверджено необхідність диверсифікації напрямів виробництва продукції в сільськогосподарських підприємствах через поєднання рослинницьких і більш трудомістких тваринницьких, переробних виробничих підроз-

ділів. Це дозволить зменшити виробничі ризики й сезонність праці, наповнити фонди оплати праці підприємств тощо.

На основі аналізу впливу технологічних факторів на економічну ефективність виробництва продукції тваринництва в сільськогосподарських підприємствах обґрунтовано необхідність інтенсифікації виробництва через поліпшення кормової бази й організацію селекційної роботи, оптимізацію обороту й відтворення основного поголів'я

худоби та птиці протягом року тощо. Для ефективного розвитку тваринництва в сільськогосподарських підприємствах потребує вдосконалення маркетингово-збутової діяльності та організації праці персоналу.

Ключові слова: продукція тваринництва, сільськогосподарське підприємство, спеціалізація виробництва, диверсифікація бізнесу, ефективне виробництво, інтенсифікація виробництва, організація праці.



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