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Efficiency of the use of resource potential of livestock enterprises in the Carpathian region of Ukraine

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Purpose. *The purpose of the study is to determine and comprehensively assess the main indicators of the efficiency of resource potential use of livestock enterprises in the Carpathian region of Ukraine and justify the corresponding reserves for their increase to ensure the growth of production of competitive products and export opportunities.*

Methodology. *The study was based on general scientific research methods, namely: the monographic method was used during a comprehensive study of the theoretical and practical foundations of the formation and effective use of resource potential of livestock enterprises; methods of analysis and synthesis were applied in the study of the dynamics of livestock development indicators in enterprises; the calculation-constructive method was used when determining the influence of the main factors on the indicators of the efficiency of resource potential use of enterprises, the system method was taken into account to build cause-and-effect relationships between factors and values of indicators of the effective use of resource potential of enterprises in the industry.*

Results. *The article examines the dynamics of the main components that form resource potential in livestock enterprises. The main factors that determined the change in the quantitative and cost indicators of the resource potential of the enterprises of the industry for the studied period were established and substantiated. A system of indicators for assessing the resource potential of the enterprises of the industry was proposed, which include: the volume and cost of products produced per average annual head of productive animals of different species, as well as per average annual conditional head for a more objective comparison; per hectare of forage land area taking into account different levels of potential yield; per ton of feed used, taking into account the conversion level for each direction of animal husbandry; per unit of capital cost.*

Originality. *The main reserves for increasing the efficiency of resource use in the enterprises of the animal husbandry industry of the Carpathian region were substantiated, which include the implementation of a system of organizational and economic, information and advisory and financial and investment levers to promote technological modernization of production. According to the results of the study, it was found that the efficiency of resource potential use is highest in enterprises that produce eggs, milk and raise pigs for meat with significant justified opportunities for further growth in the cost of produced products per unit of cost or the number of resources involved.*

Practical value. *The study consists in determining the values of the main types of indicators of the efficiency of resource potential use in enterprises of the livestock industry, as well as identifying important growth reserves for adjusting and improving the system of supporting the development of a balanced agricultural sector of the Carpathian region with an increasingly large share of livestock production in the inter-sectoral balance in order to optimally use the resources involved and increase the export opportunities of products with higher added value.*

Keywords: *resource potential, enterprises, livestock, efficiency, product cost, feed base, fodder lands, financial resources, growth reserves.*

Introduction

Agriculture in Ukraine is one of the most prioritized and strategically important sectors of the economy, ensuring the generation of more than half of export revenues and contributing to the strengthening of the country's food and economic security, particularly under the conditions of a full-scale war. The significance of the agricultural sector in Ukraine's economy is favorable natural and climatic conditions as well as vast areas of arable land with high fertility, which enables the development of agricultural entrepreneurship across many promising directions, provided that resources are used rationally.

The development of the agricultural sector is characterized by numerous specific features that encompass various approaches to the organization and specialization of production, as well as the influence of socio-economic conditions and resource provision. One of the most promising regions for intensifying agricultural development in Ukraine, given its favorable climatic conditions, is the Carpathian region, which includes Lviv, Ivano-Frankivsk, Zakarpattia, and Chernivtsi oblasts.

Although the resource potential of the region in agriculture is somewhat lower in terms of the area of arable land compared to other regions of the country, it is characterized by some of the highest levels of efficiency in land use. This contributes to a high level of economic efficiency and competitiveness of local agricultural enterprises. In the intersectoral balance of agriculture in the Carpathian region, due to limited arable land, livestock production has historically occupied a larger share in the structure of the value of produced output compared to southern and eastern regions, which has consistently influenced the specialization of local agricultural enterprises.

Accordingly, the study of the efficiency of resource potential utilization in enterprises of the Carpathian region is important and relevant for identifying and substantiating unused reserves for improving their performance efficiency in the long-term strategic perspective.

Literature Review

The study of theoretical and practical aspects of the formation of resource potential in the agricultural sector of Ukraine and the assessment of its efficiency has been presented in the works of many scholars. In particular, research focuses on the analysis of the main components of the resource potential of agricultural enterprises and substantiates mechanisms for their effective combination based on modern determinants of global economic growth (Stepanenko, S., 2022). Directions for improving the efficiency of resource potential utilization in agricultural enterprises with consideration of innovative development have been identified (Sulima, N., Gutsul, T., & Borovyk, N., 2024).

The main features of the formation of the resource potential of agricultural enterprises under the conditions of the information society have been substantiated, taking into account a set of environmental, social, economic, production, and financial factors that act as key elements in the system of efficiency enhancement (Zgurska, O.M., 2016). The resource potential has also been studied in the context of investment support for agricultural enterprises (Levandivskyi, O., Balaniuk, I.F., Matkovsky, P.Y., & Matskiv, V., 2023).

Scholars I. I. Vinichenko and Yu. O. Soroka define a system of indicators for evaluating the efficiency of resource potential utilization in agricultural enterprises (Vinichenko, I., & Soroka, Yu., 2015). The main components of the resource potential of agricultural enterprises have been further detailed, along with the classification of methods for analyzing and evaluating resource potential, including simulation and optimization modeling (Khodakyvskyy, V., 2025). L. V. Yarema and O. I. Zamora examine the problems of efficient use of resource potential in agricultural enterprises and substantiate the increase in efficiency based on the growth of production capacity with lower unit capital costs (Yarema, L.V., & Zamora, O.I., 2017).

Further development has been achieved in studies related to methodological approaches to determining the components of the resource potential of agricultural enterprises (Hryvkivska, O., & Volianiuk, V.,2025), identifying key directions for improving resource use efficiency (Bahan, N., 2021), generalizing methods for optimizing enterprise resource potential (Zhmudenko, V., & Lishchuk, R., 2021), and assessing resource potential in the context of strategic management (Alyokhina, Y., 2025), digital transformation (Kalyna, T., Stupen, R., Arzumanian, T., 2024).), and employment provision (Alieksieieva, O., 2022).

However, the aforementioned studies mainly address general theoretical and practical aspects of the formation and evaluation of resource potential efficiency at the level of the agricultural sector or enterprises in Ukraine as a whole, without distinguishing between livestock and crop production and without considering the regional specifics of the Carpathian region. This substantiates the relevance of the present study, which takes into account both sectoral and regional specialization in

order to identify differences in the efficiency of the use of key types of resources, particularly for enterprises engaged in livestock production.

It should also be noted that the presented results of assessing the efficiency of resource potential utilization in livestock enterprises of the region represent a logical and substantive continuation of our previous research, which focused on modeling the economic potential of agricultural enterprises in the Carpathian region, taking into account available resources and the levels of their utilization efficiency (Maksym, V., Chemerys, V., Kunytska-Iliash, M., Borshchevskyi, V., & Dushka, V., 2025).

Methodology

The information base of the study consists of the works of Ukrainian scholars devoted to the theoretical and practical aspects of the formation and efficiency of resource potential utilization in agricultural enterprises, as well as statistical data on the dynamics of livestock numbers in enterprises of the region, volumes of production of main livestock products, feed consumption, average selling prices, production productivity indicators, book value of capital, and other relevant data.

Based on the analyzed materials, the value of livestock production per standardized head was determined and substantiated. A comparative analysis of indicators across enterprises in the oblasts comprising the Carpathian region was conducted, and reserves for improving the efficiency of resource potential utilization in livestock enterprises of the region were identified.

The study is based on general scientific research methods. In particular, the monographic method was applied for a comprehensive examination of the theoretical and practical foundations of the formation and efficient use of resource potential in livestock enterprises, taking into account socio-economic and natural-climatic conditions. Methods of analysis and synthesis were used to examine the dynamics of input indicators of livestock development in enterprises when assessing the efficiency of resource potential utilization.

The calculation and constructive method was applied to determine the significance of the influence of key factors on efficiency indicators of resource potential utilization in livestock enterprises. The systemic approach was used to establish cause-and-effect relationships between factors of efficient resource use and performance indicators, including the value of livestock production per standardized head, per hectare of forage land, and per unit of capital value of enterprises.

Purpose of the Article

The purpose of the study is to determine and assess the indicators of efficiency of resource potential utilization in livestock enterprises of the Carpathian region of Ukraine and to substantiate the main reserves for their improvement in order to ensure growth in the production of competitive products and export potential.

The main objectives of the study, in accordance with the stated purpose, include: defining the essence and key components of resource potential and the efficiency of its use in agricultural enterprises; analyzing the resource potential of livestock enterprises in the region; identifying the main indicators of efficiency of resource potential utilization; and substantiating the key reserves for improving the efficiency of resource potential utilization in livestock enterprises of the region.

Results

The formation of the resource potential of agricultural enterprises is a highly relevant issue today. Modern agricultural enterprises face numerous challenges and require efficient utilization of available resource potential to ensure sustainable and innovative development (Sulima, N., Gutsul, T., & Borovyk, N., 2024). The resource potential of agricultural enterprises forms the basis of their stable development

and competitiveness and includes land, labor, material-technical, financial, and information resources, the combination of which ensures the development of the agricultural sector (Alyokhina, Y., 2025; Hryvkivska, O., & Volianiuk, V., 2025).

In our view, the resource potential of enterprises is the aggregate of all available means and objects of labor that can be utilized to increase production volumes under conditions of their most productive use. In the agricultural sector, depending on specialization, the resource potential of enterprises is formed on the basis of available agricultural land, livestock numbers, qualified personnel, means of production, and objects of labor which, when rationally combined with the selected technology, enable the organization of agricultural production aimed at generating profit. The resource potential of enterprises depends on the level of utilization of all available resources and the possibilities of their additional inflow into the production system.

For livestock enterprises, the foundation of resource potential, which determines production volumes, includes: the number of productive animals from which livestock products are obtained (offspring, live weight gain, milk, eggs, etc.); areas of agricultural land under forage crops forming the raw material base for balanced feeding; production facilities of livestock complexes; specialized machinery and equipment for animal husbandry; objects of labor, including materials and feed stocks; financial resources of enterprises as a combination of own, attracted, and borrowed funds at their disposal; information resources; and qualified production personnel who integrate these resource groups according to the chosen technology to ensure livestock production.

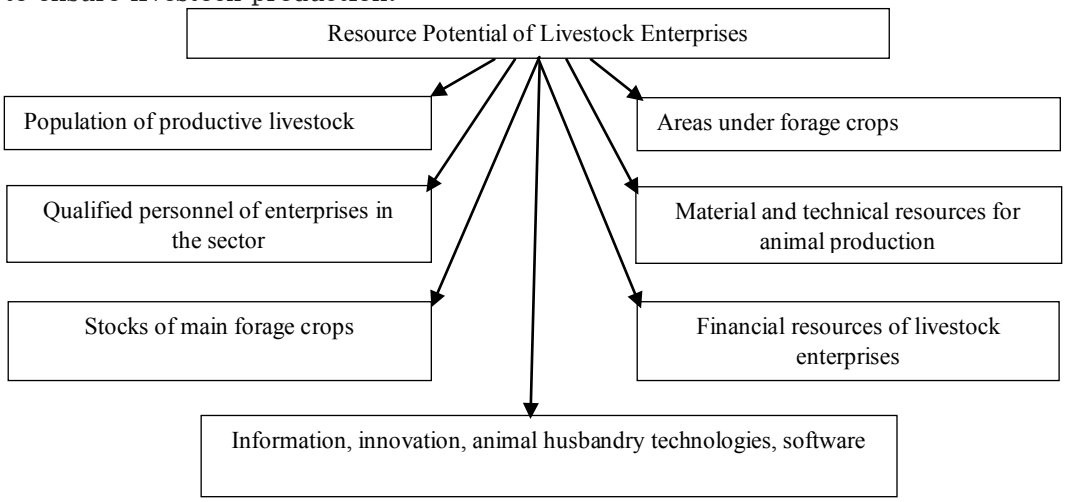

Fig. 1. Main Components of the Resource Potential of Livestock Enterprises

**Developed by the authors*

The resource potential of enterprises increases with the growth of the quantitative inflow of the specified types of resources into the production system and, conversely, decreases with the reduction of the quantitative parameters of the involved resources.

For the development of livestock production in enterprises of the Carpathian region, based on strengthening the main components of resource potential, it is necessary to: expand production facilities for keeping and raising productive animals with appropriate equipment and machinery; increase the area of land under forage crops to boost gross yields of key feed components, taking into account the structure of livestock production; increase the number of high-productivity animal breeds; and provide training and attract additional qualified personnel to support the production of larger volumes of livestock products.

An increase in the volume of incoming resource components of livestock enterprises will contribute to the expansion of production and sales volumes, which will, in turn, enhance their overall economic potential.

The efficiency of resource potential utilization in livestock enterprises is based on a system of physical and monetary indicators which, when considered comprehensively, provide an objective assessment of productivity for each component. These indicators enable comparison of production results, expressed in physical or monetary terms, per unit of resources used. The main indicators for assessing the resource potential of livestock enterprises include:

– the volume (value) of produced output, revenue from sales, or profit calculated:
– per average annual head of productive livestock, or per standardized head;
– per hectare of land under forage crops;
– per centner of feed units used in animal production;
– per employee or per unit of labor cost;
– per unit of the average annual value of capital employed in specialized enterprises.

The efficiency of resource potential utilization is determined not only by the quantity and quality of available resources (factors), but also by their proportionality, adequacy, and alignment with the requirements of the tasks being performed (Stepanenko, S., 2022).

The Carpathian region of Ukraine possesses significant unrealized potential for the development of livestock enterprises. One of the distinctive features of agricultural development in the region is the relatively small share of enterprises in total livestock numbers and production volumes, alongside the dominant role of household farms, which account for the majority of livestock and total output in the sector.

However, positive trends are observed in the gradual shift in the structure of livestock production toward specialized enterprises, which demonstrate higher levels of resource productivity and greater growth potential.

Table 1 presents statistical data on the dynamics of livestock numbers in enterprises of the region. According to the data, over a five-year period, the number of poultry increased with an average annual growth rate of 11%, exceeding 10 million heads by the end of 2024. This trend is expected to continue due to the construction of new egg and meat poultry enterprises, particularly in Lviv and Zakarpattia oblasts.

Additionally, the number of pigs in regional enterprises increased by 26.7% during the study period, reaching over 680 thousand heads, with an average annual growth rate of about 6%. The number of cattle remained relatively stable, amounting to approximately 34 thousand heads by the end of the period.

Table 1

Livestock Population in Enterprises of the Region, 2020-2024 (thousand heads)

Agricultural animals of all species	2020	2021	2022	2023	2024	2024 vs 2020, %	Average annual rate of change
Cattle	34,3	32,9	34,7	33,2	33,6	97,96	0,99
Pigs (swine)	537,1	568,3	640,8	631,8	680,8	126,75	1,06
Poultry	6734,1	7807,9	7652,7	7809	10223,4	151,82	1,11
Other livestock	15,6	18,6	23	23,4	21,5	137,82	1,08

Source: developed based on data from (State Statistics Service of Ukraine, 2026).

To generalize information on livestock numbers in enterprises across different species, it is advisable to convert them into a single criterion – namely, standardized livestock units, which represent a unified measurement unit used for grouping animals of different species and age categories for further comparison (Table 2).

Table 2

Livestock Population in Enterprises of the Region in Standardized Livestock Units, 2020–2024 (thousand heads)

Agricultural animals by species and applied conversion coefficients into standardized livestock units	2020	2021	2022	2023	2024	2024 vs 2020, %
Cattle (0,8)	27,4	26,3	27,8	26,6	26,9	97,96
Pigs (swine) (0,3)	161,1	170,5	192,2	189,5	204,2	126,75
Poultry (0,014)	94,3	109,3	107,1	109,3	143,1	151,82
Other livestock (0,1)	1,6	1,9	2,3	2,3	2,2	137,82
Total	284,4	308,0	329,4	327,8	376,4	132,34

Source: calculated based on data from (State Statistics Service of Ukraine, 2026).

The total number of agricultural animals kept in enterprises of the region as of the end of 2024 showed significant growth and, according to our calculations, amounted to approximately 376 thousand standardized livestock units, which is 32% higher than in 2020, based on the applied conversion coefficients.

In the structure of standardized livestock units, more than half is accounted for by pigs, while poultry represents nearly 40%, which determines the specialization of enterprises in the region with a focus on pork production compared to other regions of Ukraine, where poultry production enterprises dominate in terms of output. However, with the construction of new poultry farms in the region, their share in the structure of standardized livestock units is expected to increase.

The share of enterprises in the region within the total livestock population of Ukraine has been increasing over the study period. The highest share is observed in pig farming – over 23%, which is nearly 10 percentage points higher than in 2020 (Figure 2).

Enterprises engaged in poultry production in the region are also strengthening their positions, reaching a share of up to 9.3%. The region's share in the cattle population among Ukrainian enterprises remains relatively stable at 3.6%, with a slight increase of 0.2 percentage points over five years.

The growth in the share of regional enterprises in livestock numbers and production volumes is primarily associated with the onset of the full-scale war in 2022 and the occupation of significant parts of eastern and southern regions. This led to the loss of resource potential of many enterprises, material damage, and subsequent reductions in livestock numbers and production volumes.

The number of the main biological asset in livestock production – the population of productive animals – and the efficiency of their breeding directly affect production volumes, which, according to the data in Table 3, have increased across all major areas except cattle breeding.

Thus, over the study period, the volume of live weight production of pigs and poultry increased by 44-49%, with an average annual growth rate of about 10%. Poultry meat production is the most developed in the Carpathian region, while cattle breeding represents the smallest share among the main livestock

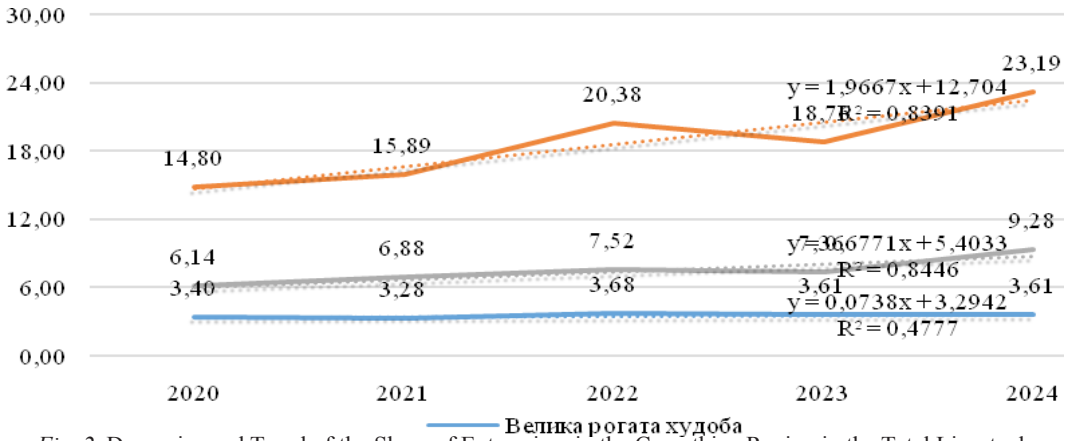

Fig. 2. Dynamics and Trend of the Share of Enterprises in the Carpathian Region in the Total Livestock Population by Main Types Maintained by All Enterprises of Ukraine, 2020-2024

Source: calculated based on data from (State Statistics Service of Ukraine, 2026).

Table 3

Live Weight of Livestock Sold for Slaughter by Enterprises of the Carpathian Region, 2020-2024 (thousand tons)

Types of agricultural animals	2020	2021	2022	2023	2024	2024 vs 2020, %	Average annual rate of change
Average annual rate of change	5	5,4	4,4	5,7	4,4	88,0	0,97
Pigs (swine)	81,9	92	99,7	110,7	122,1	149,1	1,10
Poultry	107,2	122,7	118,4	129,8	154,5	144,1	1,10
Other livestock	1,1	0,7	0,9	0,8	6,5	6 раз	1,56
Agricultural animals of all species	195,2	220,8	223,4	247	287,5	147,3	1,10

Source: developed based on data from (State Statistics Service of Ukraine, 2026).

sectors in enterprises. Over five years, cattle production declined by 12%, reaching 4.4 thousand tons by the end of 2024, which is associated with relatively lower profitability compared to pig and poultry production.

It is also worth noting the rapid increase in the production volumes of other types of agricultural animals in the region, particularly in the final year of the study period.

Examining the dynamics of the share of enterprises in the region in the total volume of live weight gain of agricultural animals of all species, it is important to note positive trends across the main production areas (Figure 3).

Overall, enterprises in the region accounted for up to 12% of the total live weight gain as of 2024, which is nearly 3 percentage points higher than at the beginning of the period. A similar increase is observed in the share of regional enterprises in poultry meat production. However, the most significant growth in the importance of regional enterprises occurred in pig production, where the share increased to 20.3%, which is 5 percentage points higher than in 2020.

Due to its relative distance from the frontline, the Carpathian region has been less affected by the negative consequences of the war. As a result, it is more

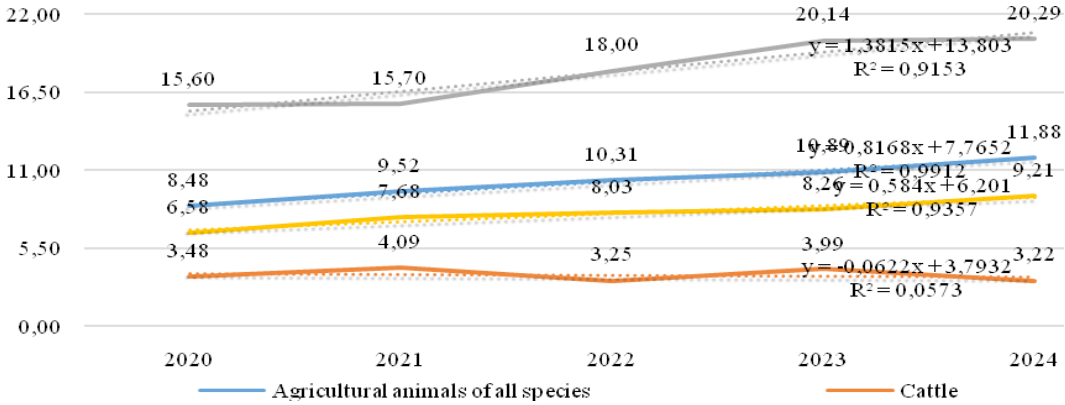

Fig. 3. Dynamics and Trend of the Share of Enterprises in the Carpathian Region in the Total Volume of Live Weight Sales of Agricultural Animals by Main Types across All Enterprises of Ukraine, 2020-2024

Source: calculated based on data from (State Statistics Service of Ukraine, 2026).

attractive for investment in livestock production, contributing to the emergence of new specialized enterprises in the sector and ensuring further long-term growth in the share of regional enterprises in the total production of livestock products in the country.

Positive trends have also been observed in the dynamics of milk production volumes by enterprises in the region, particularly in the context of a rapid decline in the number of cows in household farms, which shifts the structure of supply in favor of enterprises.

Overall, milk production in enterprises exceeded 60 thousand tons in 2024 (Figure 4). However, the share of enterprises in milk production within the region remains relatively low (around 6%), whereas the average share of enterprise-produced milk in Ukraine has already exceeded 30%.

The upward trend in the share of enterprise-produced milk in the total supply is expected to continue in the coming years, driven by the need to replace supply from household farms with higher-quality production.

Egg production in the Carpathian region is also largely concentrated in household farms; however, the share of enterprises in total output continues to increase due to the construction of new specialized egg production complexes.

According to the results of 2024, enterprises in the region produced approximately 180 million eggs, the majority of which were generated by enterprises in Lviv oblast (Figure 5). Specialized industrial poultry production is virtually absent in Zakarpattia oblast, which negatively affects the uniformity of production concentration and the ability to meet local market demand.

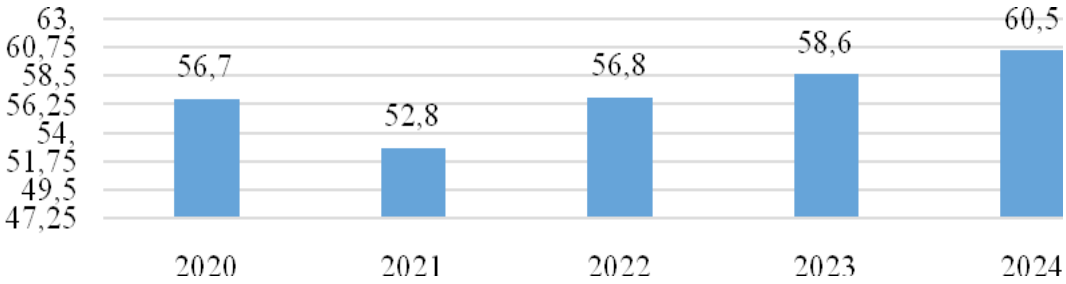

Fig. 4. **Dynamics of Milk Production Volumes in Enterprises of the Carpathian Region, 2020-2024 (thousand tons)**

Source: *developed based on data from (State Statistics Service of Ukraine, 2026).*

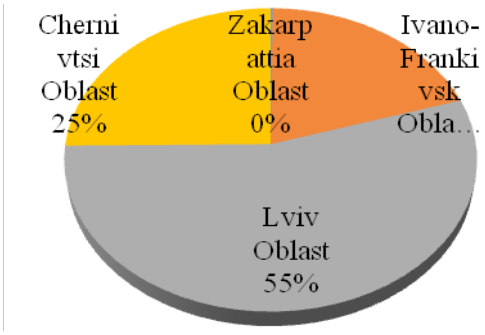

Fig. 5. Structure of Egg Production Volumes in Enterprises of the Carpathian Region by Oblast, 2024 (values – million units, structure – %)

Source: developed based on data from (State Statistics Service of Ukraine, 2026).

At the same time, given the overall declining trends in livestock production volumes among household farms, the share of enterprises in the structure of supply is expected to continue increasing. Poultry farming remains one of the key drivers of growth in the agricultural sector of the region.

An important indicator of the efficiency of resource potential utilization in livestock enterprises is meat production per average annual head, which is determined by the level of development of production technologies for different types of agricultural animals (Table 4).

Table 4

Meat Production per Average Annual Head of Agricultural Animals by Main Types, 2020-2024 (thousand tons)

Types of agricultural animals	2020	2021	2022	2023	2024	2024 p. Vs 2020, %	Average annual rate of change
Cattle	146	164	127	172	131	89,83	0,97
Pigs (swine)	152	162	156	175	179	117,62	1,04
Poultry	15,9	15,7	15,5	16,6	15,1	94,93	0,99

Source: calculated based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research on production cyclicality in livestock enterprises across different areas of specialization.

Meat production per head is influenced by the cyclical nature of the production process and the intensity of animal growth, which largely depend on the level of average daily weight gain at all stages of rearing.

During 2020-2024, the average meat output per average annual head of pigs in enterprises of the region amounted to approximately 180 kg, with an average annual increase of about 4%, according to our estimates.

However, in cattle and poultry production, a declining trend in meat output per head is observed. In poultry production, enterprises obtain approximately 15-16 kg per average annual head per year, which, taking into account production cycles, exceeds 2 kg per production cycle.

It should be noted that the value of this indicator in poultry farming may vary significantly depending on specialization. However, since more than 90% of poultry meat is produced by enterprises engaged in broiler production, the calculated indicators are close to actual values.

One of the key resources determining the potential of livestock production is the volume of cultivated forage crops and the efficiency of their use in animal feeding.

Table 5

Feed Consumption of All Types per 1 kg of Livestock Output in Enterprises of the Carpathian Region by Oblast, 2020–2024 (feed units)

Zakarpattia Oblast							
Type of product	2020	2021	2022	2023	2024	100,2	1
Milk	0,9	1,31	1,66	-	1,28	142,22	1,09
Live weightof cattle		5,51	6,95	-	6,52	-	-
Live weightof Pigs (swine)	4,45	6,29	6,64	-	3,75	84,27	0,96
Poultry	3,2	3,2	3,2	3,2	3,2	-	-
Eggs	0,16	0,16	0,16	0,16	0,16	-	-
Ivano-Frankivsk Oblast							
Type of product	2020	2021	2022	2023	2024	100,2	1
Milk	1,14	1,19	1,14	1,07	1,02	89,47	0,97
Live weightof cattle	16,9	15,68	15,62	14,76	13,04	77,16	0,94
Live weightof Pigs (swine)	3,26	3,16	3,19	3,04	3,08	94,48	0,99
Poultry	3,2	3,2	3,2	3,2	3,2	-	-
Eggs	0,16	0,16	0,16	0,16	0,16	-	-
Lviv Oblast							
Type of product	2020	2021	2022	2023	2024	100,2	1
Milk	1,11	1,12	0,86	0,89	0,84	75,68	0,93
Live weightof cattle	15,08	13,26	13,35	12,25	13,36	88,59	0,97
Live weightof Pigs (swine)	4,03	4,04	3,55	3,58	3,31	82,13	0,95
Poultry	3,2	3,2	3,2	3,2	3,2	-	-
Eggs	0,16	0,16	0,16	0,16	0,16	-	-
Chernivtsi Oblast							
Type of product	2020	2021	2022	2023	2024	100,2	1
Milk	1,08	0,91	0,76	0,7	0,7	64,81	0,9
Live weightof cattle	12,31	11,84	10,69	11,27	11,61	94,31	0,99
Live weightof Pigs (swine)	5,06	7,42	4,54	5,48	8,22	162,45	1,13
Poultry	3,2	3,2	3,2	3,2	3,2	-	-
Eggs	0,16	0,16	0,16	0,16	0,16	-	-

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research on normative feed consumption in poultry production.

Table 5 presents statistical data on feed consumption of all types per unit of output, including live weight gain of cattle and pigs, as well as milk production in enterprises of the Carpathian region.

Due to the lack of complete statistical data, feed consumption indicators for poultry production and egg production are presented as normative values based on our research. Specifically, these amount to 3.2 feed units per 1 kg of weight gain in meat poultry production and 0.16 feed units per egg.

Analyzing the data, it should be noted that feed consumption, and consequently its efficiency, differs significantly among enterprises across the oblasts.

In particular, the lowest feed consumption in cattle production is observed in Zakarpattia oblast– only 6.52 feed units per 1 kg of live weight gain, which is twice lower than in other oblasts of the region. Feed consumption for milk production is characterized by a high level of efficiency in enterprises of Lviv and Chernivtsi oblasts – within the range of 0.7-0.84 feed units per 1 kg of output, which is significantly lower than in Ivano-Frankivsk and Zakarpattia oblasts.

Relatively lower feed conversion efficiency is observed in pig production in Lviv and Ivano-Frankivsk oblasts, in contrast to enterprises in Chernivtsi oblast, which are characterized by significant overconsumption of feed in pig farming.

In general, enterprises of the Carpathian region used more than 1 million tons of feed of all types for livestock production, according to our calculations, taking into account the indicated average conversion rates. The increase in feed consumption is mainly driven by the development of poultry and pig production, which together account for more than 90% of total feed resources used in the region.

Over the study period, feed consumption of all types in livestock enterprises increased by approximately 200 thousand tons, according to our estimates (Figure 6).

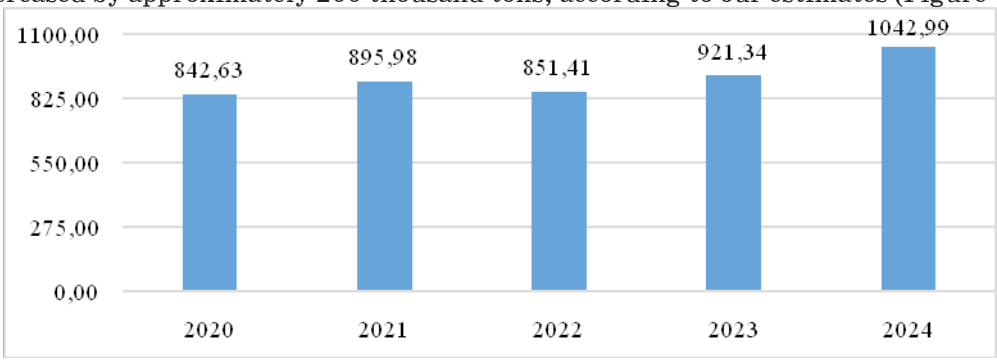

Fig. 6. **Estimated Feed Consumption of All Types for Livestock Production in Enterprises of the Carpathian Region, 2020–2024 (thousand tons of feed units)**

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

It should be noted that feed costs constitute the largest share in the cost structure of all types of livestock production and may vary depending on specialization – from about 50% in meat and dairy cattle production to up to 90% in egg poultry production.

Therefore, the efficient use of feed is one of the key reserves for increasing the economic potential of livestock enterprises, especially when feed conversion ratios significantly deviate from optimal levels.

According to our research, the total value of livestock production generated by enterprises in the region amounted to approximately €420 million, which exceeds €1,100 per average annual standardized head per year (Figure 7).

The largest share is accounted for by pig production – 45%. The second position is occupied by poultry meat production – over 40%, while other livestock sectors collectively account for approximately 15%.

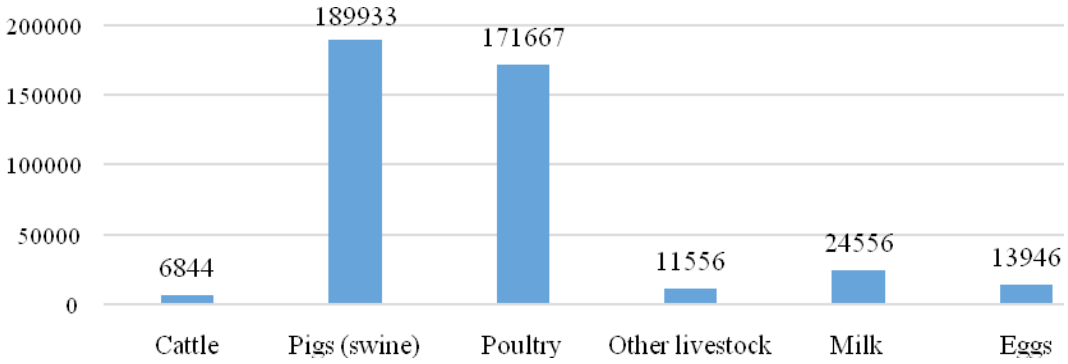

Fig. 7. Estimated Value of Livestock Production by Enterprises of the Carpathian Region by Main Types, 2024 (thousand euros)

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

The value of produced output is determined by two key factors: the level of selling prices and production volumes. While price levels represent a dynamic category that continuously changes and depends on various market factors – such as the balance of supply and demand, inflation, and production costs – production volumes in livestock enterprises depend on the number of agricultural animals and their productivity.

Together, these factors determine the efficiency of resource potential utilization.

Taking into account the volume of livestock production per average annual head in enterprises of the region, the estimated income based on average prices of 2024 has been determined (Figure 8).

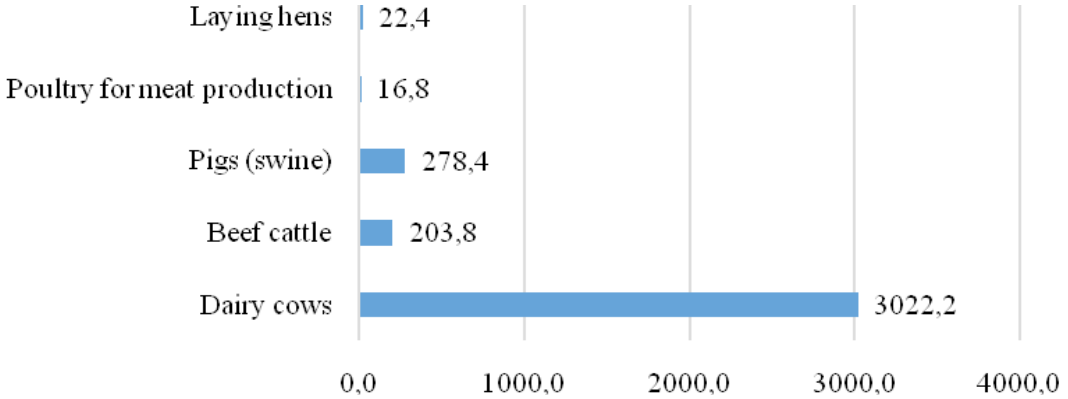

Fig. 8. Income per Average Annual Head of Agricultural Animals by Main Types in Enterprises of the Carpathian Region, Calculated at 2024 Prices (euro per head)*

*Income per dairy cow is calculated based on an average marketable milk yield of 8,000 kg per lactation, and for laying hens based on an average annual egg productivity of 280 eggs.

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

The highest level of annual income (over €3,000) is calculated for dairy cows, with an average marketable milk productivity of 8,000 kg or more. One average annual head of pigs generates up to €280 of income; however, considering a two-cycle production system per year, this corresponds to approximately €140 per actually raised and sold pig.

According to our estimates, poultry meat production in regional enterprises generates about €17 of income per average annual head, particularly in broiler

production under a seven-cycle production system per year. For other types of poultry production, income levels may differ due to lower production cyclicality.

In egg production, one laying hen generates over €22 of income per year, assuming a productivity level of at least 280 eggs per hen.

The efficiency of feed utilization can be assessed based on the level of income per ton of consumed feed units across different livestock production areas in specialized enterprises (Figure 9).

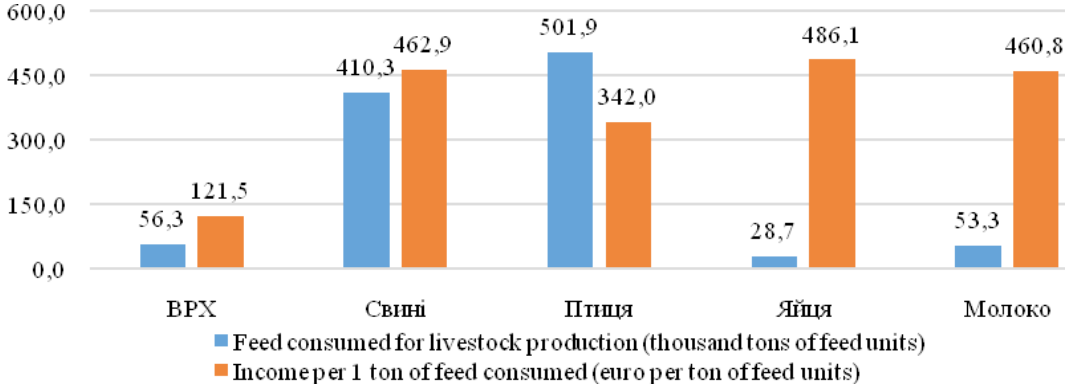

Fig. 9. Estimated Efficiency of Feed Utilization in Livestock Enterprises of the Carpathian Region, Calculated at 2024 Prices (euro per ton of feed units)

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

According to our research, the highest feed return is observed in egg production – up to €490 per ton of feed units. Relatively high values are also recorded in milk production and pig farming –around €460.

In poultry meat production, enterprises generate approximately €342 per ton of feed units, whereas the efficiency of feed use in cattle production is 3–4 times lower compared to other livestock sectors. This is обусловлено technological особенностями production processes and a relatively small difference in live weight selling prices compared to pig and poultry production.

However, the continued decline in beef production in Ukraine, including in the Carpathian region, is expected to lead to an increase in beef prices, which will contribute to reducing the gap in feed utilization efficiency compared to other livestock sectors.

Another key indicator of the efficiency of resource potential utilization in livestock production is the calculated value of output per 1 hectare of land under forage crops.

Taking into account feed consumption norms for livestock production and different yield levels of forage grain crops, the potential income from livestock production based on the feed base obtainable from 1 hectare of land has been determined.

According to our research, the highest profitability is observed in egg production, which at 2024 prices amounts to approximately €2,900-4,860 per hectare at yields of 6–10 tons of feed units (equivalent to about 5–9 tons of forage grain crops).

A high level of profitability is also characteristic of pig production and milk production – within the range of €2,700-4,600 per hectare, depending on yield levels. Poultry meat production generates approximately €2,000-3,400 per hectare, while the lowest productivity is observed in cattle production – around €700-1,200 per hectare. This represents a critically low level for value creation, as the value of harvested forage crops per hectare exceeds the value of the live weight of cattle produced on their basis.

Table 6

Estimated Profitability of Production of Main Types of Livestock Products in Enterprises of the Carpathian Region per 1 Hectare of Forage Land Depending on Yield Levels, at 2024 Prices

Livestock products	Yield of forage crops per hectare (tons of feed units)			
	6	7	8	10
Cattle, euro	729,0	850,5	972,0	1215,0
Pigs (swine), euro	2777,6	3240,6	3703,5	4629,4
Poultry, euro	2052,2	2394,2	2736,3	3420,3
Eggs, euro	2916,7	3402,8	3888,9	4861,1
Milk, euro	2764,7	3225,5	3686,3	4607,9
Average indicator weighted by the share of each product in total production (euro)	2407,5	2808,8	3210,0	4012,5

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

Overall, the average profitability of livestock production in enterprises of the region per 1 hectare of forage land ranges from €2,400 to €4,000 at 2024 prices.

To assess the efficiency of capital utilization in livestock enterprises of the region, it is necessary to analyze the dynamics of the value of current and non-current assets, as well as equity (Table 7).

Table 7

Book Value of Capital of Livestock Enterprises in the Carpathian Region of Ukraine (million euros)

	2020	2021	2022	2023	2024	2024 vs 2020	Average growth rate
Current assets	164,36	241,79	284,70	287,25	249,61	151,86	1,11
Non-current assets	203,43	220,94	229,27	230,84	248,00	121,91	1,05
Equity	223,89	263,59	289,85	312,58	301,50	134,67	1,08

Source: developed based on data from (State Statistics Service of Ukraine, 2026).

Overall, during the study period, enterprises in the sector accumulated nearly €500 million in total current and non-current capital, of which approximately 60% is equity.

The ratio of current to non-current capital approached a balanced structure in 2024, which distinguishes this year from previous periods when current assets, with the exception of 2020, accounted for a larger share than non-current assets.

It should be noted that a positive trend in capital growth is observed compared to 2020, with the exception of a decline in current assets in 2024. However, the average growth rate of this indicator over the five-year period amounted to 11%.

An increase in the value of non-current assets is also observed, reaching up to 22% over the study period, with an average annual growth rate of about 5%.

The efficiency of capital utilization in livestock enterprises of the region is assessed based on the indicator of income per unit of capital value (Figure 10), which averaged approximately €0.87 per €1 of total non-current and current assets as of 2024.

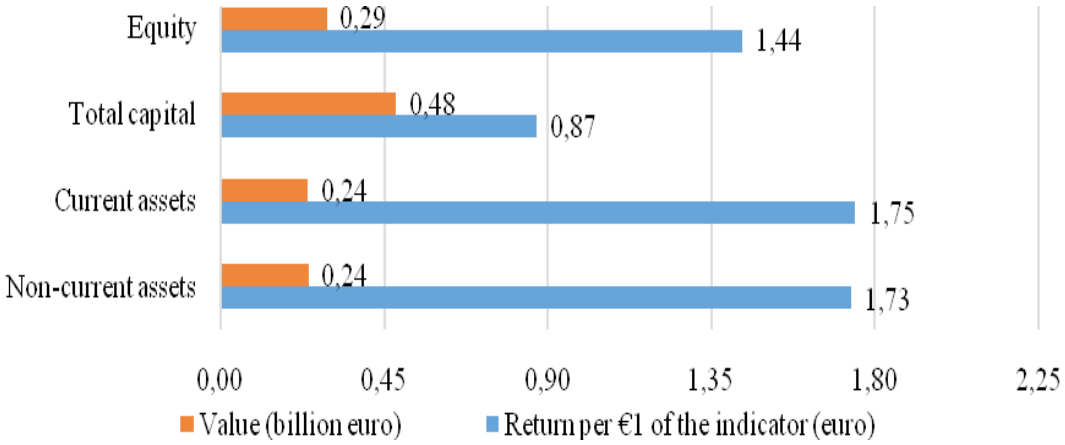

Fig. 10. Efficiency of Capital Utilization in Livestock Enterprises in the Carpathian Region of Ukraine, 2024

Source: developed based on data from (State Statistics Service of Ukraine, 2026) and the authors' own research.

Accordingly, given the nearly equal shares of these two types of assets in the structure, each €1 of their value corresponds to approximately €1.73-1.75 of generated income, and about €1.44 in terms of equity.

The increase in capital efficiency for the production of main types of livestock products in regional enterprises is closely related to the results of their economic activity, particularly production and sales volumes, average selling prices, achieved levels of technological productivity, and other factors.

Therefore, to ensure an increase in capital efficiency, enterprises should implement a комплекс of organizational and technological measures aimed at reducing feed conversion rates, as feed constitutes the largest share in the structure of current assets and directly affects capital returns.

It is also necessary to optimize the use of other raw materials and inputs, improve energy efficiency through technological modernization based on resource-saving principles, and determine and substantiate the optimal capital structure, including the balance between current and non-current assets, taking into account the specifics of different livestock production activities.

Improving the efficiency of resource potential utilization in livestock enterprises of the Carpathian region requires the application of a systemic approach to planning the optimal structure of production, taking into account the existing feed base and the possibilities for its expansion through increasing the area under forage crops.

It is also important to continuously compare the dynamics of profitability relative to crop production. In most cases, livestock production is more profitable than the main export-oriented grain and industrial crops widely cultivated in the region. Accordingly, in order to increase the efficiency of resource potential utilization – particularly in terms of income per hectare of agricultural land – it is advisable to expand the production of key livestock products. In the long term, this will also contribute to the growth of the overall economic potential of the agricultural sector.

One of the significant reserves for improving the efficiency of resource potential in livestock enterprises of the region is, in our view, the deepening of diversification through the in-house production of key feed components for animal nutrition. This is driven by the substantial difference between market prices of feed crops and their production costs, which contributes to increased value added.

It is also important to improve technologies for keeping and raising agricultural animals in order to achieve higher productivity indicators, including through the

adoption of innovative technologies, which directly affects the efficiency of resource potential utilization in enterprises of the sector.

Additionally, effective veterinary support and animal care at all stages of production must be ensured to prevent potential losses caused by animal mortality due to dangerous infectious diseases, particularly avian influenza and African swine fever, and to prevent their spread.

A leading role in achieving higher efficiency of resource potential utilization in livestock enterprises is played by the development of advisory services and other forms of information and consulting support for businesses. This enables the implementation of best international practices in livestock production, taking into account the natural, climatic, and environmental characteristics of the Carpathian region.

To stimulate the growth of efficiency in resource potential utilization in livestock enterprises, sufficient financial support is required for low-profit sectors, particularly cattle, sheep, and goat production. This is necessary to ensure their technological modernization through the introduction of innovative livestock production technologies aimed at achieving higher productivity of utilized resources.

In modern conditions of agricultural business, it is also important to implement innovative technologies and effective management solutions to enhance the productivity of employed resources, taking into account environmental and social aspects of enterprise functioning, which contributes to the development of sustainable agriculture (Hryvkivska, O., & Volianiuk, V., 2025).

Conclusions

According to the results of the study, it has been established that livestock enterprises in the region are characterized by significant potential for improving the efficiency of resource utilization. This potential can be realized through the implementation of a комплекс of measures aimed at improving animal production technologies, providing financial support for low-profit livestock sectors, optimizing production structure, developing the feed base, and ensuring informational support for enterprises in the sector.

Key indicators of resource potential utilization efficiency have been calculated, including the volume and value of output per average annual head and per standardized livestock unit, as well as the value of output per hectare of forage land. The highest efficiency levels were observed in egg production, milk production, and pig farming.

Overall, according to our research, enterprises in the sector generated approximately €1.1 thousand per average annual standardized head, while the average profitability per hectare of forage land may reach up to €4,000 at a yield level of 10 tons in feed units, corresponding to about €400 of livestock output per ton of feed consumed.

The efficiency of capital utilization in the sector was also assessed, amounting to approximately €1.73-1.75 for current and non-current assets, which corresponds to about €0.9 per unit of their total value as of 2024.

The increase in efficiency indicators of resource utilization is a necessary condition for realizing the economic potential of enterprises in the sector and enhancing their competitiveness.

Prospects for Further Research

It is important to continue and further deepen research on the impact of key technological and economic factors on the efficiency of resource potential utilization in livestock enterprises of the Carpathian region, with the aim of identifying and substantiating potential reserves for growth across specific areas of specialization.

It should also be noted that the available regional statistics related to the dynamics of labor resources, wages, and working time include only aggregated data covering all types of agricultural enterprises, without distinguishing enterprises engaged specifically in livestock production. Therefore, due to the lack of sufficiently detailed and specialized data, it was not possible to analyze the productivity of labor resource utilization.

Accordingly, this area of research will be addressed in future studies in a comprehensive manner, without differentiation by types of economic activity within the agricultural sector of the region, and will constitute a subject for further scientific work.

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Максим В. Л., Куницька-Іляш М. В., Березівський Я. П. Ефективність використання ресурсного потенціалу підприємств галузі тваринництва Карпатського регіону України

Мета. *Мета дослідження полягає у визначенні та комплексному оцінюванні основних показників ефективності використання ресурсного потенціалу підприємств галузі тваринництва в Карпатському регіоні України та обґрунтування відповідних резервів щодо їх підвищення для забезпечення зростання виробництва конкурентоспроможної продукції та експортних можливостей.*

Методологія. *Дослідження базувалося на загальних наукових методах дослідження, а саме: монографічний метод використовувався під час комплексного вивчення теоретичних і практичних основ формування та ефективного використання ресурсного потенціалу підприємств галузі тваринництва; методи аналізу та синтезу застосовані в дослідженні динаміки показників розвитку тваринництва у підприємствах; розрахунково-конструктивний метод використаний під час визначення впливу основних чинників на показники ефективності використання ресурсного потенціалу підприємств, системний метод враховували для побудови причинно-наслідкових взаємозв'язків між чинниками та значеннями показників ефективного використання ресурсного потенціалу підприємств галузі.*

Результати. *У статті досліджено динаміку основних складових, які формують ресурсний потенціал у підприємствах з виробництва продукції тваринництва. Встановлено та обґрунтовано основні чинники, які визначали зміну кількісних і вартісних показників ресурсного потенціалу підприємств галузі за досліджуваний період. Запропоновано систему показників для оцінювання ресурсного потенціалу підприємств галузі, які включають: обсяг та вартість виробленої продукції у розрахунку на одну середньорічну голову продуктивних тварин за різними видами, а також в перерахунку на одну середньорічну умовну голову для більш об'єктивного порівняння; у розрахунку на один га площ кормових угідь з врахуванням різних рівнів потенційної урожайності; на одну т використаного корму, з врахуванням рівня конверсії за кожним напрямом тваринництва; у розрахунку на одиницю вартості капіталу.*

Оригінальність. *Обґрунтовано основні резерви зростання ефективності використання ресурсів у підприємствах галузі тваринництва Карпатського регіону, які охоплюють впровадження системи організаційно-економічних, інформаційно-консультативних і фінансово-інвестиційних важелів для сприяння технологічній модернізації виробництва. Відповідно до результатів дослідження встановлено, що ефективність використання ресурсного потенціалу найвища у підприємствах, які виробляють яйця, молоко та вирощують свиней на м'ясо із значними обґрунтованими можливостями для подальшого зростання вартості виробленої продукції на одиницю вартості чи кількості залучених ресурсів.*

Практична цінність. *Дослідження полягає у визначенні значень основних видів показників ефективності використання ресурсного потенціалу у підприємствах галузі тваринництва, а також виявленні важливих резервів зростання для коригування та удосконалення системи підтримки розвитку збалансованого аграрного сектору Карпатського регіону із щораз більшою часткою виробництва продукції тваринництва у міжгалузевому балансі з метою оптимального використання залучених ресурсів і нарощуванні експортних можливостей продукції з вищою доданою вартістю.*

Ключові слова: *ресурсний потенціал, підприємства, тваринництво, ефективність, вартість продукції, кормова база, кормові угіддя, фінансові ресурси, резерви зростання.*

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