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SHEEP FARMING IN UKRAINE: FINANCIAL, ECONOMIC, MANAGERIAL AND SOCIO-CULTURAL ASPECTS OF SUSTAINABLE DEVELOPMENT

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Abstract. In conditions of active hostilities, there is a need to preserve national and cultural identity while ensuring the economic development of the state. This necessitates the study of those spheres of production that are historical and traditional, yet capable of producing economic effects. Therefore, the purpose of the manuscript is to study sheep farming as a historical, economic, national and cultural value of the Ukrainian people, as well as a source of food, materials for processing, medical goods, income of the state, communities, and citizens, a place of work in rural areas and to provide the recommendations for support and development of this industry in Ukraine. During the research, a number of scientific research methods were used, in particular: formal and legal assessment, comparison, graphic, tabular, and cartographic analysis, synthesis, regression analysis, and branched fraction theory. The article analyzes the regulatory and legal framework for the development and support of sheep farming in Ukraine at the state and community levels; a comparison of the current sheep population in Ukraine and wool production volumes with similar indicators of world leaders in sheep farming was conducted; the distribution of agricultural animals by regions of Ukraine was studied and mapped; key indicators of the spread of sheep farming within Ukraine were analyzed; regression tools and branched continued fractions were used to build a forecast of the sheep and goat population and wool production volumes in Ukraine in 2025 and 2026; a critical analysis of domestic and foreign studies of the problems and prospects for the expansion of the sheep farming industry was conducted; relevant recommendations were formulated regarding the support and future progress of sheep farming as a component of economic activity and a means of preserving the national and cultural identity of Ukrainians.

Keywords*:* sheep farming, agriculture, economy, management, organization, strategic governance, cultural value, sustainable development.

JEL Classification:Q10, L60, M21, O1

1. INTRODUCTION

As one of the key branches of agriculture, sheep farming offers undeniable advantages and produces a wide range of food and non-food products in demand in the market and among consumers. This creates the prerequisites for the industry to take an essential place in the national economic system, offering consumers high-quality, competitive products that utilize all production capacities.

Even though sheep breeding is traditionally viewed through the prism of economic feasibility and modern trends in its development (innovative technologies, environmental sustainability, integration

into global wool and meat markets), it is essential to consider this industry's cultural dimension. Sheep breeding has long been an important part of Ukrainian culture, leaving a deep mark on literature, art, folklore, and cinema. Images of shepherds and shepherd life can be traced in the writers' works, as well as in folklore plots and traditional songs. The artistic interpretation of sheep breeding not only recorded the realities of economic life but also symbolized man's spiritual connection with nature, forming the ethnocultural code of Ukrainians. That is why it is worthwhile to supplement the study of the modern economic prospects of sheep farming with an analysis of its cultural heritage, which allows a better understanding of the sustainability and significance of this industry in social development.

In addition, the industry can become an effective tool for the rehabilitation of veterans and other war victims. Sheep farming should also be considered as a source of development of rural areas, through the preservation and dissemination of traditions, the revival of national memory and historical heritage, increasing interest in a healthy lifestyle, ensuring social stability in rural areas, which will ultimately ensure the sustainable development of the agricultural sector and territorial communities.

According to the "Strategy for the Development of Agriculture and Rural Areas in Ukraine for the Period up to 2030" (Strategy, 2024), it is determined that today's challenges caused by military actions have significantly worsened national and international food security, exacerbated many other issues related to providing the population with food, in particular due to restrictions on the use of land for agriculture (mined, contaminated with harmful substances or occupied). Local communities with a traditional or historical focus on livestock farming have identified sheep farming as a significant and promising direction for agricultural development (Strategy for the development of Kosiv Urban Territorial Community for 2022 – 2027).

Therefore, food security issues, the valuable use of land, providing other industries with raw materials for economic stability, and creating new jobs require a systematic review. Under these circumstances, sheep farming is of strategic importance as a branch of livestock farming, since Ukraine has appropriate resources and climatic conditions for its development, which is outlined in the "Concept of the State Targeted Economic Program for the Development of Livestock for the Period Until 2033" (Concept, 2025).

This differs significantly from the agricultural production structure in European Union countries, where 43% is livestock, with a specific share in dairy products (Strategy, 2024). This significantly differs from the European Union countries' agricultural production structure, where 43% is livestock with a specific share of dairy products (Strategy, 2024).

The issue of increasing consumer prices for food products with a parallel decrease in income and purchasing power of the population that did not leave the country during the military aggression of 2022-2025 is also drawn in the "Strategy for the Development of Agriculture and Rural Areas in Ukraine for the Period up to 2030".

Several existing problems in the development of livestock farming determine the strategy:

- increased risks of loss of income, reduction in production volumes (in particular, mountainous areas and temporarily occupied territories);
- difficult conditions for the resumption of agricultural work in de-occupied territories due to mining, destruction of production potential, machinery, and equipment.
- lack of financial resources for the implementation of an effective state agrarian policy and promoting an increase in the number of agricultural producers;
- reduction in exports of finished products due to mining and blockade of domestic seaports in the Azov and Black Seas, complication of logistics operations for transporting finished products;
- low level of innovation and scientific research aimed at the modernization of agriculture and its digitalization;
- demographic crisis in rural areas, insufficient support for farmers at the initial stage.

The outlined trends require effective measures to improve state policy, mitigate their negative impact on employment and population well-being, and reduce the risks to food and environmental

security (Strategy, 2024).

2. THEORETICAL BACKGROUND

Further growth of the agricultural sector, particularly sheep farming, depends on practical measures, including the application and rapid development of new technologies. This necessitates the creation of regulatory, organizational, and socio-economic conditions that will facilitate expanded reproduction. The state support for livestock producers is of primary importance here. It is carried out in accordance with the Law of Ukraine "On State Support for Agriculture of Ukraine," namely, through budget livestock subsidies. When planning state budget expenditures for the next year, the Cabinet of Ministers of Ukraine allocates funds for subsidies to livestock producers. Sheep are among the objects of budget subsidies (Law of Ukraine "On State Support for Agriculture of Ukraine"). Under conditions of subsidies, on the other hand, the strategy of competition policy can be effectively implemented at the level of territorial communities (Zinchuk et al., 2025; Boussakra,& Abdeslam, S., 2025). The level of qualification among the local public officials plays a vital role in the efficiency of implementing such strategic plans (Danyliuk et al., 2023). Effective state police, under conditions of decentralization, through the implementation of effective organizational and economic instruments, may exert direct and indirect influence on sustainable rural development (Patyka et al., 2023; Dmytryshyn et al., 2021).

Sheep breeding in Ukraine is undergoing a transformation, combining a decline in livestock numbers with the search for new development directions. The loss of certain breeds and the limited use of modern artificial reproductive technologies pose risks to the preservation of genetic diversity.

The study showed that over the past 25 years, the number of sheep and goats has decreased by more than 2 times (1.9 million in 2020, 0.8 million in 2025). The livestock industry of Ukraine is currently facing increased systemic problems, especially in conditions of full-scale war: the indicators of livestock and production of milk, meat, and eggs are deteriorating (Dukhnytskyi& Dukhnytskyi, 2025). In recent years, 15 breeds of farm animals have disappeared in Ukraine, including three sheep breeds and two goat breeds (Glushkov, 2025).

Despite the reduction in livestock, experts note the prospects for developing sheep breeding. This is not only about producing meat and wool, but also about providing military clothing, using wool as a strategic raw material, and applying it in therapeutic practices for war survivors. The industry's existing potential remains underutilized due to a lack of state support and long-term investments (Tyrunskiy & Bogdanova, 2025). To increase the effectiveness of the state aid, it must be focused primarily on small and medium-sized farms.

In the global context, sheep farming thematic research starts from the origin of sheep breeds and their evolution (Yang et al, 2024) to the nutritional value of the sheep meat (Ding et al, 2024; Liu, et al, 2024) and wool as an efficient industrial material (Hetimy et al, 2024; Midolo et al, 2024). The economic efficiency of utilizing and preserving livestock products was studied by Kuzenbayeva and Tuleshova (2025), and the modern conditions for implementing renewable energy in agriculture to achieve sustainable development, considering climate change, were investigated by (Ibrayeva,2025). A model of economic security management for agricultural enterprises, accounting for market changes, was proposed by Kramarenko et al. (2025). Farms' ability to adapt to changing economic conditions in Ukraine was investigated by Shpykuliak et al. (2025).

At the same time, an analysis of European experience shows that the industry can successfully integrate into sustainable agriculture strategies focused not only on meat and wool production, but also on the formation of strategic resources, "solar sheep breeding", the development of the textile industry and the use of livestock products in medical and rehabilitation practices.

3. RESEARCH OBJECTIVE, METHODOLOGY AND DATA

During the research, the following sources of information were processed and used:

- scientific publications of leading Ukrainian and foreign scientists and interdisciplinary research;
- the latest Ukrainian and world statistical information;
- the legislative framework of Ukraine, strategies, and programs of territorial communities;
- data from official websites of state authorities, local governments, and territorial communities;

The methods of scientific research that were used during the research are given in Table 1.

Tab. 1

Research methods

Method	Objective	Limitations
Formal and legal evaluation	To examine the current regulation system regarding the sheep farming in Ukraine	Limited to the availability of valid regulatory documents
Comparison	To evaluate and review the previously obtained results	Has only a theoretical basis and limited to the available results
Graphical method	To draw the figures	Needs special tools
Tabular method	To arrange the given data	Requires data that meets certain conditions
Analysis	To compare the data from different countries and Ukrainian regions	Limited to available statistics
Synthesis	To understand the general role of sheep farming in different spheres	Limited to agricultural production
Cartography	To show the regional dissemination of the students.	Needs special tools
Regression analysis	Forecast the sheep population and wool production in Ukraine	Require normalization in case of low forecast realism
Theory of branched continued fraction	To build the econometric models	Require specific knowledge of the mathematical tools

4. RESULTS AND DISCUSSION

To find out the Ukrainian role in sheep farming worldwide, let us first analyze the general quantity of sheep (Figure 1).

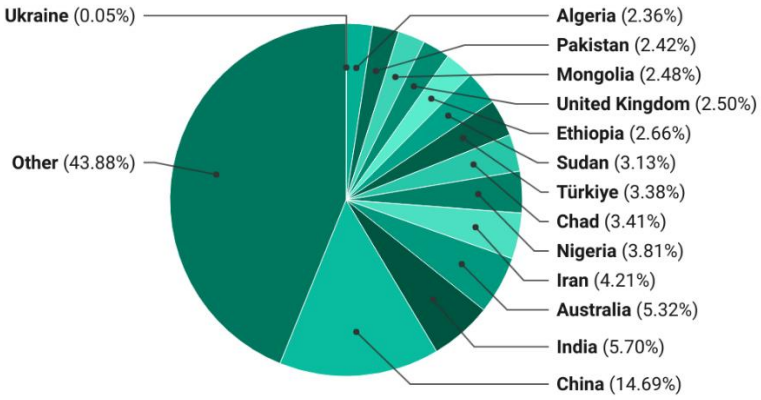

Fig. 1. World leaders' and Ukraine's share in sheep population as of 2023 (updated in 2025), %
Source: developed by the authors based on Sheep Population by country 2025 (Updated list)
Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/gy1g5/?v=7

Figure 1 shows that China is a world leader in sheep population; India and Australia also have a significant share of the sheep population. As of the beginning of 2023, Ukraine has 607 thousand sheep, which is equal to 0,05% of the world sheep population (1,3 billion) and has the potential for its growth.

Next, we show total wool production by world leaders and Ukraine (Figure 2).

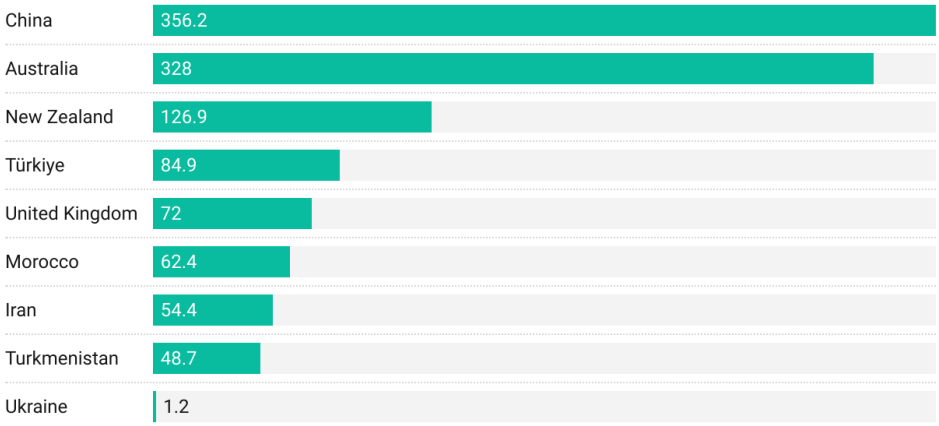

Figure 2. World leaders' and Ukraine's wool production as of 2023 (updated in 2025), thousand tons
Source: developed by the authors based on Wool Production by Country 2025
Note: created with datawrapper, interactive version is available athttps://www.datawrapper.de/_/dCgMU/?v=3

In wool production, China and Australia maintain their leading positions; India, with 36,4 thousand tons, has risen to 15th place. Ukrainian wool production is relatively high compared to the number of sheep; we have 2 kilograms of wool per 1 sheep. This is more than in China, India, Iran, Türkiye, Ethiopia, Mongolia, Pakistan and Algeria. Among the world sheep farming leaders, Australia and New Zealand (Table 2).

Let us move on to studying domestic statistics. Sheep breeding is an economic activity of agro-industrial production, namely animal husbandry. Based on this, it is advisable to start the numerical analysis by considering data on the cultivation of agricultural animals. In Figure 4, using the Datawrapper resource (https://www.datawrapper.de/), data on the live weight of agricultural animals' distribution by regions of Ukraine as of the first half of 2025 are plotted on the map of Ukraine.

Tab. 2

Sheep population and wool production comparison in Ukraine and the world's leading countries

Country	**Sheep** *thousand heads*	**Wool** *thousand tons*	**Wool production per 1 sheep** *kilograms*
China	194000	356,2	1,84
India	75300	36,4	0,48
Australia	70200	328,0	4,67
Iran	55600	54,4	0,98
Türkiye	44700	84,9	1,90
Ethiopia	35100	7,3	0,21
United Kingdom	33100	72,0	2,18
Mongolia	32700	14,8	0,45
Pakistan	32000	43,5	1,36
Algeria	31200	33,9	1,09
New Zealand	25300	126,9	5,02
Morocco	21800	62,4	2,86
Turkmenistan	14300	48,7	3,41
Ukraine	600	1,2	2,00

Source: developed by the authors based on Sheep Population by country 2025 (Updated List);
Note: world production per 1 sheep calculated by the authors

The figure shows the wool production per 1 sheep (Figure 3).

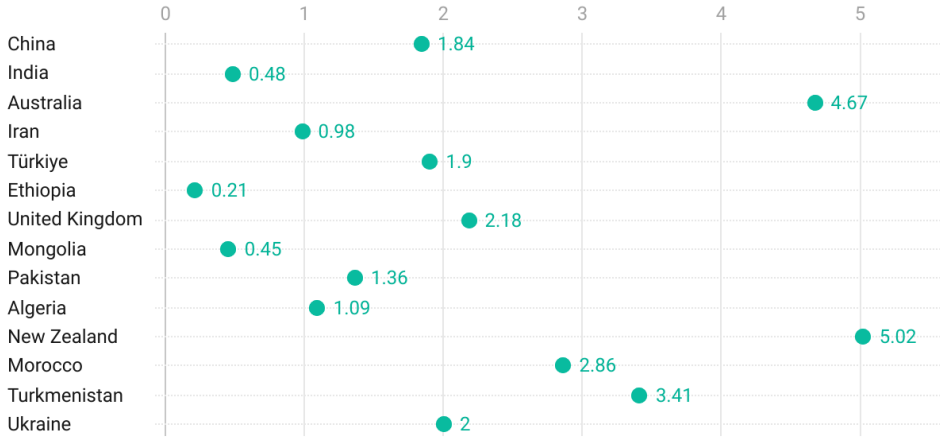

Fig. 3. Wool production per 1 sheep, kilograms

Source: calculated by the authors based on Wool Production by Country 2025

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/LTvbt/?v=2

In compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information and excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted, the statistical data from the State Statistics Service of Ukraine is limited to some extent. Other restrictions are related to the publication of data on sheep breeding in combination with goat breeding, respectively, the size of these animals, and the similarity of their feeding.

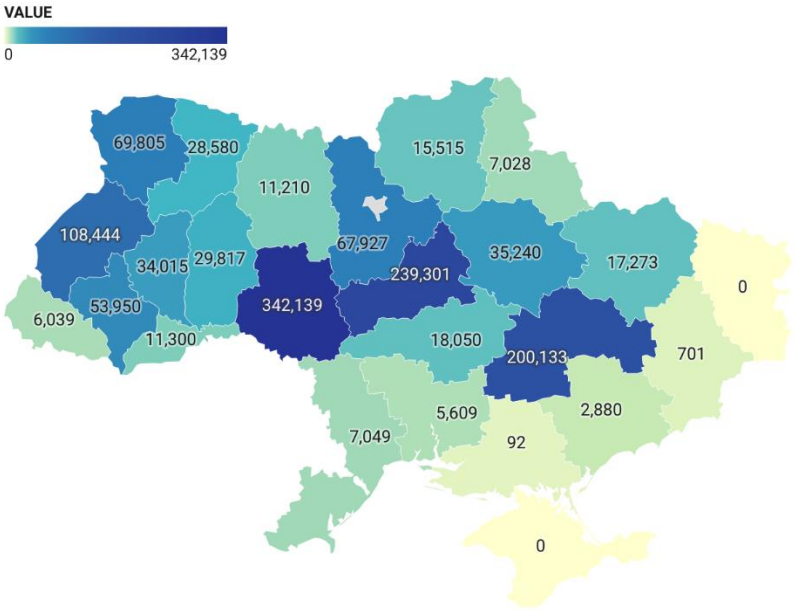

Fig. 4. Live weight of agricultural animals' distribution by regions of Ukraine as of the first half of 2025, tons

Source: developed by the authors based on Live weight of agricultural animals breeding in enterprises in January -July 2025, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/CrhNs/?v=3

According to the data presented in Figure 4, we can record that the most significant volumes of livestock farming are localized in Vinnytsia, Cherkasy and Dnipropetrovsk regions.

In Figure 5, we will continue the study of the number of sheep and goats (live weight) in the central distribution regions of Ukraine as of the first half of 2025, noting the regions of their most excellent distribution.

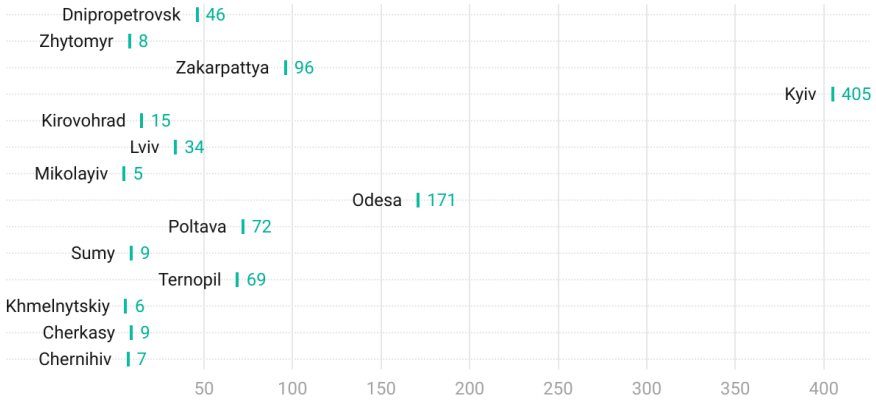

Fig. 5. Number of sheep and goats (live weight) breeding in the enterprises of Ukraine in the main distribution regions as of the first half of 2025, tons

Source: developed by the authors based on Live weight of agricultural animals breeding in enterprises in January -July 2025, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/59kOW/?v=4

According to the data in Figure 6, the regions with the greatest spread of sheep and goat fattening are Kyiv, Odesa, and Zakarpattia. In addition, the Kyiv region also leads in weight gain during fattening and grazing.

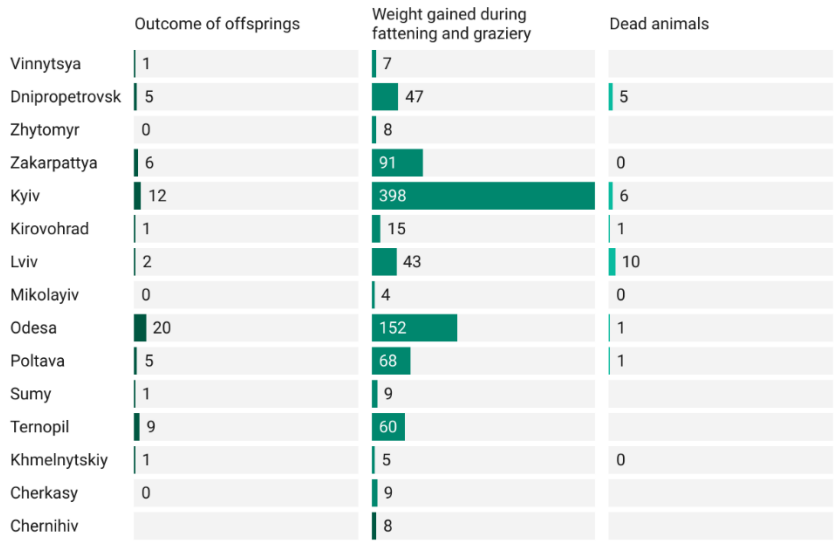

Fig. 6. Number of sheep and goats breeding (live weight) in the main distribution regions of Ukraine as of the first half of 2025, tons

Source: developed by the authors based on Live weight of agricultural animals breeding in enterprises in January -July 2025, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/ZFcx8/?v=4

Sheep and goat farming is widely spread among both enterprises and households (Figure 7).

Comparing the data given in Figure 7 and Figure 4, it can be assumed that sheep and goat farming is mainly located in households.

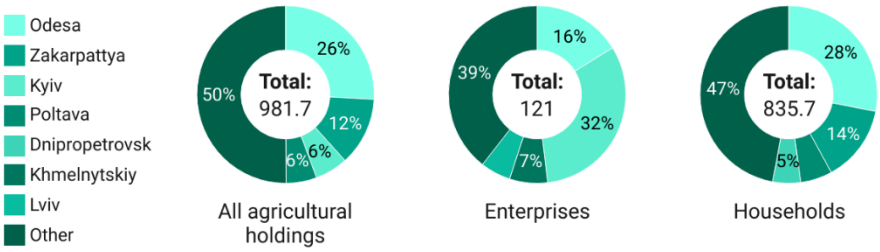

Fig. 7. Share of sheep and goats by enterprises in the main distribution regions of Ukraine as of the first half of 2025, %

Source: developed by the authors based on Number of agricultural animals as of August 01, 2025, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/lFfCp/?v=4

Let us compare the share of households and enterprises in sheep and goat farming with other agricultural animals breeding (Figure 8).

As can be seen from Figure 8, the sheep and goat group of animals is the most widespread among households. On the contrary, cattle, pigs, and poultry are more often located in the enterprises.

Grouping of the enterprises by the number of sheep and goat by regions of Ukraine is given in Figure 9.

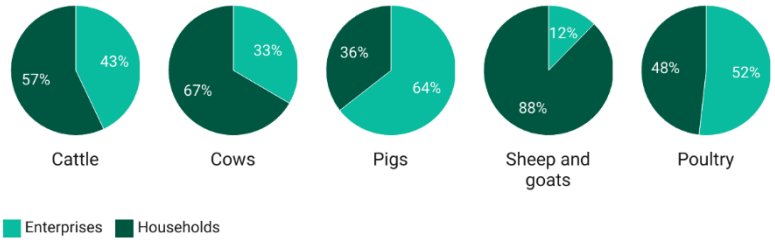

Fig. 8. Share of the agricultural animals by type as of August 2025, %

Source: developed by the authors based on Number of agricultural animals as of August 01, 2025, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

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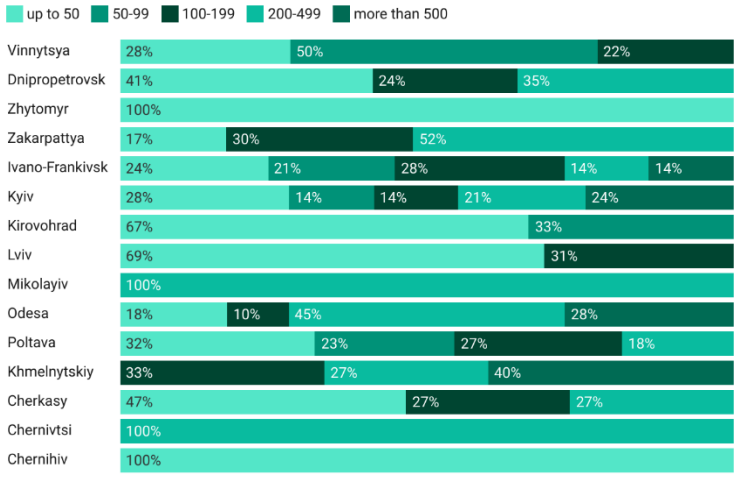

Fig. 9. Share of the agricultural enterprises by their number of sheep and goats as of January 2025, %

Source: developed by the authors based on Grouping of enterprises by animal production and agricultural animals in 2024, excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/nKppv/?v=3

To follow the previous conclusion on the spread of sheep and goat among households, from Figure 8, it can be assumed that in most Ukrainian regions, this type of farming is arranged chiefly in small enterprises, except in the Kmelnytskiy region.

After, let us make a forecast of the total number of sheep and goats in Ukraine using the branched continued fraction model (Figure 10) and total wool production in Ukraine (Figure 11).

Branched continued fraction model (Fig. 10)

$$y = y(\mu, x) = F(\mu) - \frac{0.056x}{F(-\mu)} - \frac{0.056\alpha_2 x}{F(\mu)} - \frac{0.056\alpha_3 x}{F(-\mu)} - \ldots, R^2 = 0.8066 \quad (1)$$

where

$$F(\mu) = 1 + \frac{\mu}{1} + \frac{\alpha_2\mu}{1} + \frac{\alpha_3\mu}{1} + \ldots, \mu = 8.672, \alpha_{2k} = \frac{1}{2-4k}, \alpha_{2k+1} = \frac{1}{2+4k}, k \geq 1. \quad (2)$$

$$y = (v, x) = G(v) - \frac{0.08x}{G(-v)} - \frac{0.08b_2 x}{G(v)} - \frac{0.08b_3 x}{G(-v)} - \ldots, R^2 = 0.8113 \quad (3)$$

where

$$G(v) = 1 + \frac{v}{1} + \frac{b_2 v}{1} + \frac{b_3 v}{1} + \ldots, v = 9.73, b_{2k} = \frac{1}{2-4k}, b_{2k+1} = \frac{1}{2+4k}, k \geq 1. \quad (4)$$

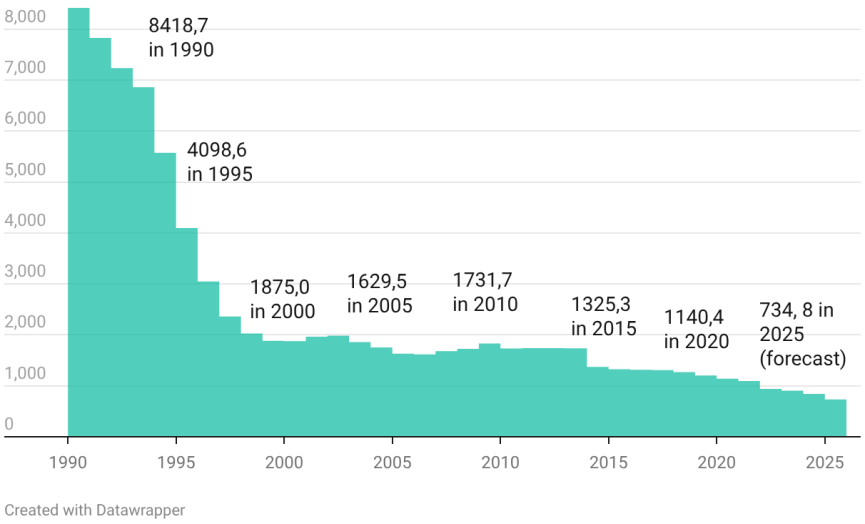

Fig. 10. Fact and forecast of the sheep and goats' population in Ukraine (1990-2026), thousand heads

Source: developed by the authors based on Livestock (1990-2024), excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/jrAYe/?v=3

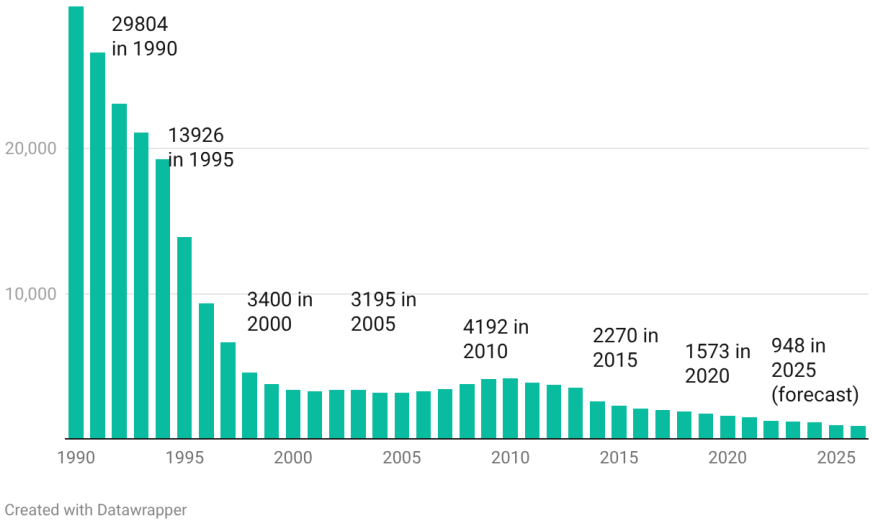

Fig. 11. Fact and forecast of the wool production in Ukraine (1990-2026), thousand tons

Source: developed by the authors based on Livestock (1990-2024), excluding the territories which are temporarily occupied and part of the territories where the military actions are/were conducted and unpublished data to ensure compliance with the requirements of the Law of Ukraine "On the State Statistics" regarding confidentiality of statistical information.

Note: created with datawrapper, interactive version is available at https://www.datawrapper.de/_/kUEwQ/

In (Dmytryshyn, 2004), a method for constructing branched continued fraction models based on special functions using the correspondence principle between a double power series and a functional branched continued fraction is described. Models (1)-(2) and (3)-(4) are constructed using the representation of an exponential function by a two-dimensional regular C-fraction with independent variables (Dmytryshyn, 2020). Some problems of convergence of this branched continued fraction can be found in (Antonova & Dmytryshyn, 2020;Dmytryshyn, 2019). Note that models like these can also be constructed using the representation of special functions into corresponding two-dimensional A and J-fractions with independent variables (Dmytryshyn & Sharyn, 2025).

According to the data given in Figure 10 and Figure 11, sheep population and wool production are expected to decrease in 2025, and this tendency is expected to continue in 2026.

In recent decades, there was a steady trend towards a reduction in the number of sheep, as well as the decline of the wool processing industry. This is due to a complex of economic, social, environmental and management factors, including a decrease in the profitability of production and in demand for natural wool, competition from synthetic materials, as well as an insufficient level of state support. Among other things, several factors should be highlighted:

- insufficient state support for the industry;
- lack of effective programs for the development of sheep farming;
- difficulty in obtaining subsidies or grants;
- imperfect agrarian policy for small farmers;
- outflow and aging of the population engaged in sheep farming;
- lack of effective programs for the development of sheep farming.

An analysis of two sheep farms in Greece using different reproductive management systems showed that introducing artificial intelligence can be economically feasible and effective, provided it is used correctly and responsibly (Liagka et al., 2025). The experience of Greece shows that educational and organizational measures, subsidies, and farmer cooperation in artificial insemination can significantly increase the economic efficiency and sustainability of the sector. In Ukraine, artificial insemination is practically not used (Glushkov, 2025). At the same time, research into the economic efficiency of different sheep farming systems shows that the strategic choice of management methods also plays a central role.

Thus, based on cost-benefit analysis, Merida et al. (2024) compared organic and non-organic sheep farming in Iceland, concluding in favor of the former. The analysis was carried out across four cost categories to determine the economic feasibility of the two sheep farming systems. Organic sheep farming was found to be more attractive in terms of investment, as it demonstrates a higher net present value and benefit-cost ratio, and offers environmental advantages. Investing in sheep farming is essential to the sustainable development of rural regions and the agricultural sector as a whole, thereby increasing food security and strengthening the national economy. Thus, the experience of Icelandic farmers encourages the development of organic sheep farming, but the environmental impact of this practice remains open and requires further research. In this context, scientists are also drawn to new approaches that combine traditional livestock farming with renewable energy sources.

Thus, Xu et al. (2024) developed a theoretical game model of solar sheep farming, an innovative concept combining sheep farming and solar energy. Two powerful solar power plants were analyzed: the Talatan PV solar farm and the Cascadilla community solar farm. The participants in the game were the government, investors, and sheep farmers. The study showed that the effectiveness of developing the "solar sheep farming" model depends on the chosen policy and strategy. The feed-in tariff (FIT) provides the most significant income to the state and contributes to an increase in the number of "solar sheep".

In contrast, sheep farming can stimulate the broader adoption of solar panels and may be more profitable for investors. The policy choice should consider the cost of photovoltaic panels and their impact on grazing conditions. Sheep farmers' incomes increase under the implemented FIT when the panels are inexpensive and improve grazing conditions. In the long term, a conservative approach means gradual, deliberate changes in decision-making that maintain the system's stability. An aggressive policy involves frequent, sharp adjustments to tariffs or subsidies to increase profits, but it also increases the risk of instability and unpredictable consequences. Under these conditions, an aggressive government approach to adjusting the FIT is more advantageous for investors. In contrast, the government earns higher revenues from an aggressive strategy when implementing the sheep farming policy.

In Ukraine, solar sheep farming has not yet become widespread and is in the early stages of development. However, several separate initiatives have contributed to the development of the sheep industry. In particular, according to Vasyl Stefurak, a founder of NGO "Shepherds' Association" (A flock of sheep under solar panels saves 73% on territory maintenance) a case study was implemented in the Ivano-Frankivsk region, which helped achieve 73% savings and increase livestock for the following year. Despite the advantages (dual use of land, environmental friendliness, reduced technical maintenance of the land, safe interaction with panels), this case study also has drawbacks. In particular, limited scalability (only 12 heads per 3 hectares of land) and dependence on seasons (from spring to autumn) make it difficult to assess effectiveness under other conditions, with a significant increase in the number of heads. Under such conditions, it is necessary to establish cooperation between panel owners and sheep farmers, taking climatic conditions into account. Support from the state for similar initiatives can ensure the sustainable development of the agricultural sector.

Thus, new approaches see opportunities to increase the efficiency and sustainability of sheep farming through its integration with renewable energy sources. At the same time, it is equally important to consider the sector's structural diversity, as different types of farms demonstrate varying adaptability to economic incentives, environmental challenges, and political framework conditions.

In this context, Ayala et al. (2024) identified six farm types within the Irish beef and sheep sector, two of which are clearly sheep-based: extensive sheep farms and medium-sized sheep farms. In addition, medium-sized mixed farms also partly engage in sheep farming. This highlights the sector's high heterogeneity and the need for tailored policies that account for different farm types and their specific capabilities in production, resource management, and environmental sustainability.

Ukrainian sheep farming shares some similarities with the Irish sector but has some specificities. For

example, in the Ukrainian version, the target priorities focus on farm survival and economic profitability, while environmental aspects are less integrated.

At the same time, experience from other countries, particularly Southern Benin, demonstrates that integrating crop and livestock production, along with training farmers in modern feeding practices and circular resource use, can significantly improve feed and nutrient use efficiency and contribute to sustainable farming (Koura et al., 2024).

Sheep farming is also an important segment of Pakistan's agrarian economy, contributing significantly to food security and rural employment. However, its development is constrained by limited infrastructure, a lack of veterinary services, market volatility, and environmental challenges (Ahmad et al., 2024). Similar problems are common in Ukraine, where the industry also faces insufficient technological capacity and instability in market sales channels. At the same time, both countries have the potential to strengthen the competitiveness of sheep farming by introducing innovative technologies (genomic breeding, precision livestock farming, digital management systems), optimizing feeding, and improving support policies. Thus, combining traditional practices with modern tools enables increased sustainability and efficiency in the sheep farming industries of Pakistan and Ukraine. Using abandoned real estate property (Danyliuk & Dmytryshyn, 2021; Dobrucká et al., 2024) in consultation with community inhabitants (Dmytryshyn, 2022) may strengthen local farming infrastructure and improve the territory's image.

Analyzing sheep health management practices, Boyd-Weetman et al. (2024) emphasize the importance of establishing collaboration between farmers, veterinarians, government agencies, and other stakeholders to increase the effectiveness of herd health management, improve productivity, and ensure the sustainability of sheep farming. The experience of individual European farms confirms the practical benefits of such approaches. In the Ukrainian Carpathians, sheep farming plays an essential role in regional food safety (Rudyk et al., 2023), local entrepreneurship (Kaputa et al., 2026), and nature-based tourism (Apollo et al., 2021).

Considering Pardo et al. (2023) results, transhumance is shown to have a low carbon footprint, as it reduces the need for external feed while making the most of local pastures that would otherwise remain unused. Considering the natural emissions of wild animals further reduces the "anthropogenic" footprint. This suggests that pastoralism can be named a "climate-smart" system, which, in the case of Spain, demonstrates a lower environmental impact due to the efficient use of local resources. At the same time, abandoning pastoralism can lead to increased numbers of wild herbivores or more frequent fires, both of which are accompanied by significant emissions. Pastoralism, therefore, has the potential to be a key component of a strategy to reduce agricultural emissions.

Given the current challenges of sheep farming, associated with insufficient technology, unstable markets, and limited infrastructure, the modern sector needs to implement innovative approaches to increase the efficiency and sustainability of production. One such promising area is the use of advanced technologies in precision animal husbandry, in particular non-invasive monitoring, which can improve animal health, production efficiency, and sheep welfare (Wang et al., 2025).

5. CONCLUSIONS

The "Concept of the State Targeted Economic Program for the Development of Livestock Breeding for the Period Until 2033" defines sheep farming as an important branch of agriculture, which ensures the production of high-quality goods in demand on the market and has the potential to make a significant contribution to the national economy.

Analysis of the regulatory framework indicates the presence of shortcomings in the state policy on the development of sheep breeding (fragmentation of regulatory legal acts, insufficient funding, low level of investment attractiveness, lack of incentives for modernization and innovation, etc.), which limit the efficiency of the industry and create a negative impact on the socio-economic well-being of the

population.

Based on statistical data, three leading regions of Ukraine (Vinnytsia, Cherkasy and Dnipropetrovsk regions) were identified, which are characterized by the largest volumes of livestock farming. At the same time, the share of agricultural enterprises by the number of sheep and goats kept was determined, which shows that sheep and goat farming is mainly carried out in households.

The application of the branched continuous fraction model enabled the prediction of the total number of sheep and goats and the volume of wool production in Ukraine for 2025 and 2026, indicating a further reduction in livestock numbers and in the production indicators of this industry.

The study provides data on the state of sheep farming in Ukraine. It suggests methodological approaches for assessing the current situation, forecasting the development of the industry, and forming effective strategies to support and restore this sector's economic and cultural value. The following recommendations are proposed to ensure the sustainability of the development of sheep farming: improving state support programs; developing investment and credit mechanisms focused on small and medium-sized farms; the use of digital technologies, the effectiveness of which is confirmed by European experience, for grazing (virtual fencing), reproduction (biotechnology) and health management (electronic monitoring) of sheep; the creation of educational courses and trainings for farmers and young people on innovative methods of keeping sheep, product processing and the implementation of the principles of organic sheep farming; the establishment of cooperation between farmers, veterinarians and government agencies for effective management of herd health.

Sheep breeding is not only a source of livestock products, but also a factor in preserving cultural heritage and the historical continuity of traditions. The revival of traditional forms of sheep breeding, combined with modern strategies for the development of the agro-industrial sector, is one of the effective tools for sustainable development, manifested in the strengthening of communities, the development of local economies, and the growth of the tourist attractiveness of regions. Thus, sheep breeding should be considered not only an economic activity but also a socio-cultural phenomenon.

The development of sheep farming can contribute to the progress in the territorial communities of its location by creating jobs and increasing the purchasing power of farmers and their employees, replenishing the local budget of the community and, accordingly, opportunities to improve its management, attract foreign investment, ensure food security of the territory, and preserve the national identity and cultural heritage of Ukrainians during the armed defense of the state’s existence.

Solving the problem of reducing the number of sheep, as well as the decline of the wool processing industry is possible through:

- introduction of state subsidies for maintenance;
- compensation for the costs of purchasing feed, veterinary services, and equipment;
- formation of guaranteed product sales channels (through state orders);
- modernization or creation of mini-enterprises for wool processing in communities;
- support for local textile producers (carpets, bedspreads, clothing);
- stimulation of deep processing (not just raw materials, but finished products with higher added value);
- development of local product brands.

A promising direction for further research is the assessment of the impact of environmental conditions on the development of sheep farming in wartime, which involves studying the state of natural resources, soil and water ecosystems, interaction with local biodiversity, as well as the development of practical measures to ensure sustainable, safe, and cost-effective functioning of the industry in crisis conditions.

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Дмитришин Марта, Горан Тетяна, Данилюк Марія. Вівчарство в Україні: фінансово-економічні, управлінські та соціально-культурні аспекти сталого розвитку. *Журнал Прикарпатського університету імені Василя Стефаника*, **13** (2) (2026), 181-197.

В умовах активних бойових дій виникає потреба збереження національної та культурної ідентичності із одночасним забезпеченням економічного розвитку держави. Це зумовлює потребу дослідження тих сфер виробництва, які є історичними та традиційними, але, водночас, здатні давати економічний ефект. Тому метою статті є дослідження вівчарства як історичної, економічної, національно-культурної цінності українського народу, а також джерела продовольства, матеріалів для переробки, товарів медичного призначення, доходів держави, громад, та громадян, місця роботи на сільських територіях та напрацьовання рекомендацій із підтримки та розвитку цієї галузі в Україні. Під час проведення дослідження було застосовано ряд методів наукових досліджень, зокрема: формальної та правової оцінки, порівняння, графічний, табличний, та картографічний, аналіз, синтез, регресійний аналіз, теорія гіллястих ланцюгових дробів, регресійний аналіз. У статті проаналізовано нормативно-правову базу розвитку та підтримки вівчарства Україні на рівні держави та громади; проведено порівняння поточного поголів'я овець в Україні та обсягів виробництва вовни із аналогічними показниками світових лідерів із вівчарства; досліджено та нанесено на карту розподіл агропромислових тварин за регіонами України; проаналізовано ключові показники поширення вівчарства в межах України; інструментами регресійного побудовано прогноз поголів'я овець та кіз та обсягів виробництва вовни в Україні у 2025 та 2026 роках; проведено критичний аналіз вітчизняних та закордонних досліджень проблем та перспектив розвитку галузі вівчарства; сформульовано релевантні рекомендації щодо підтримки та майбутнього розвитку вівчарства як складової економічної діяльності та засобу збереження національної та культурної ідентичності українців.

Ключові слова: вівчарство, сільське господарство, економіка, організація, стратегічне урядування, культурна цінність, сталий розвиток.