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INTEGRATED ANALYSIS OF THE SHEEP AND GOAT SECTOR IN ROMANIA IN THE PERIOD 2019–2024

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Abstract. The paper analyses the sheep and goat sector in Romania during 2019–2024, highlighting its strategic importance in the context of modern agriculture. The study highlights the high potential of sheep and goat farming, due to the favorable natural conditions, long tradition and high demand for products specific to these species. Spatial and statistical analysis reveals an uneven distribution of livestock and a general growth trend, especially in the case of goats. Milk production is stable, but the low level of profitability highlights a major dependence on subsidies. The study provides a detailed assessment of costs and the break-even point, showing that farms need to adopt efficient feeding and management strategies to remain sustainable. Comparatively, goat farming can be more profitable, but involves higher risks, while sheep farming is more financially stable. In conclusion, the sustainable development of the sector requires public support, digitalization, access to financing and continuous training of farmers.

Keywords: sheep and goat sector, sustainable development, economic profitability threshold, milk production

1. The importance of the sheep and goat sector

In all countries of the world, due to the accelerated growth of the human population, there is a call for rational use of resources, applying the most efficient technologies for raising and exploiting animals of zootechnical interest. The European integration of the Romanian agri-food sector takes place only under conditions of product competitiveness in a competitive environment.

The quantitative and qualitative increase in sheep and goat milk production must be based on clear information to ensure profitability. In the context of socio-economic instability and climate change, the sector is increasingly exposed to risks. Research must identify technically and economically efficient methods to achieve profitability and sustainable profit on the market.

Milk production and consumption have expanded globally, and trade in dairy products has experienced significant growth (Wiley, 2007). However, the multiple challenges currently facing the dairy sector affect the efficiency of farms and their level of profitability (Bórawski et al., 2020). Sustainable milk production is essential for ensuring

human nutrition and health (Tricarico et al., 2020), but faces economic risks caused by price volatility, rising costs and the effects of climate change. Efficient use of production factors can significantly contribute to increasing the economic efficiency of dairy farms (Florence et al., 2018).

Low levels of economic efficiency in dairy production can have various causes, especially managerial ones, and can therefore have important economic consequences (Hogeveen et al., 2019). The current growing challenges and increased competition in the dairy industry highlight the need for farmers to analyze in depth the economic sustainability of farms (Fiorillo & Amico, 2024).

Those who decide to intensify their farm production systems can achieve higher levels of profit, but they must be able to sustain high investments and profit variability, which is influenced by the level of product value prices, or climate risks (Baudracco et al., 2022). The most important risks perceived by farmers are those of an economic and production nature, which requires the adoption of specific risk management strategies (Schaper & Theuvsen, 2014).

In this sense, the small ruminant sector in Romania presents considerable potential, due to the favorable pedoclimatic conditions, the long tradition in raising these species and the increasing demand for products derived from them, both on the domestic and foreign markets. In addition to the economic contribution, the sector also contributes significantly to maintaining the ecological balance, by valorizing pastures and lands with low agricultural potential, which cannot be exploited efficiently through other forms of agriculture. At the same time, these activities support employment in rural areas and the preservation of local traditions, playing an important role in the sustainable development of disadvantaged areas.

2. Spatial analysis of the dynamics of sheep and goat herds, as well as sheep and goat milk production

2.1. General information about the dynamics of sheep and goat farming in Romania

Sheep have experienced a steady increase in Romania due to the tradition of shepherds, geographical conditions and the quality of the products (milk and meat). The first official data show a herd of 4.4 million in 1860, which increased to 14 million in 1990. Subsequently, in 2001 the herd was halved, but between 2001 and 2024 it increased again by over 3 million heads, reaching about 74% of the maximum level in 1990. This evolution reflects the dynamics and importance of the sheep sector in Romania.

Goat herds in Romania have increased significantly, from about 364 thousand heads in 1938 to over 1,162 thousand heads after 1989. This increase was supported both by the reproduction of native populations and by imports of breeds specialized for milk production. However, most farmers use traditional growing and feeding technologies, and the development of this sector represents a challenge and a responsibility for optimizing the nutritional and technological process at the national level.

2.2. Analysis of statistical indicators calculated for sheep and goat herds

The analysis of statistical indicators related to sheep herds in Romania, distributed across the eight development regions, over the period 2019-2024, highlights a series of essential aspects related to their distribution and dynamics. Table 1 shows that the largest average sheep herds are recorded in the Center Region, followed by the North-West and North-East.

These concentrate an important part of Romania's herds (53.10%), indicating a long tradition and favorable conditions for sheep breeding. The South-East and West regions have moderate average herds. On the other hand, the South-Muntenia, South-West Oltenia and Bucharest-Ilfov regions have the lowest average herds, with values below 1 million heads, especially the Bucharest-Ilfov Region, where the average herd is only 17,527 heads, which reflects the predominantly urban and industrial specifics of this region.

The Center region presents the highest standard deviation (60.03), suggesting a high fluctuation of sheep numbers in these years. Also, significant deviations are observed in the Southwest Oltenia (40.22) and Northeast (30.13) regions, which indicate local instabilities caused by climatic, economic or farm management factors. In contrast, the Bucharest-Ilfov and Southeast regions record lower values of the standard deviation, which reflects a relative stability of the numbers, but the numbers are small.

The coefficient of variation provides an insight into the degree of relative dispersion in each region. The Bucharest-Ilfov region presents the highest coefficient of variation (0.46), indicating a very high instability of the numbers, which may be related to the urban character of this area. In contrast, the Southeast region has the lowest coefficient of variation (0.02), reflecting the high stability of the number of sheep. Regions with coefficients of variation between 0.016 and 0.062 show moderate stability, which is expected for areas with traditional agricultural activities.

Table 1. Indicators regarding sheep herds in Romania, by development regions in the period 2019-2024

	Min	Max	Average	Deviation	C.var.*	Annual rate
	thousands of heads					
North-West	1,765	1,839	1,813	29.32	0.01	0.40
Center	2,160	2,304	2,233	60.03	0.03	0.20
North-East	1,372	1,444	1,398	30.13	0.02	-0.25
South-East	1,565	1,620	1,598	20.44	0.02	0,17
South-Muntenia	930	1,004	978	30.11	0.03	-1.90
Bucharest-Ilfov	10	27	18	8.07	0.46	-21.88
South-West Oltenia	609	693	645	40.22	0.06	-3.02
West	1,538	1,620	1,572	38.18	0.02	1.09
Total	10,087	10,359	10,255	101.95	0.01	-0.14

Source: INSSE database, accessed 06.08.2025

The annual rate of variation shows the trend of sheep herds during the analyzed period. The North-West, Center, South-East and West regions register positive rates, which indicates a slight increase in herds in these areas. In particular, the West region has a positive annual rate of +1.09%, being the only one with a more consistent increase in this interval. In contrast, the North-East, South-Muntenia, Bucharest-Ilfov and South-West Oltenia regions show negative rates, a sign that sheep herds are decreasing in these areas.

It is worth noting the sharp decline in the Bucharest-Ilfov Region (-21.88%), which reflects strong urbanization and a decrease in traditional agricultural activities. The decrease in South-Muntenia (-1.90%) and South-West Oltenia (-3.02%) can be correlated with structural problems in agriculture, lack of investments or climate change affecting pastures and animal reproduction. Looking at the total per country, the average sheep population in the analyzed period is about 10.25 million heads, with a standard deviation of approximately 101,948, which indicates a relatively small variation compared to the total average, and the annual rate of - 0.14% suggests a general slightly downward trend at the national level.

In conclusion, the analysis by regions shows an uneven distribution of sheep herds in Romania, with traditionally strong areas in the Center and North-West, while other regions, especially those with urban characteristics or agricultural problems, are experiencing declines. These data can be useful for planning interventions and policies to support the sheep sector, by allocating resources, stimulating investments and developing infrastructure in regions with high potential, but also by finding adapted solutions for areas with declining herds.

Table 2. Indicators regarding goat herds in Romania, by development regions in the period 2019-2024

	Min	Max	Average	Deviation	C.var.*	Annual rate
	thousands of heads					
North-West	91	95	92	1.58	0.02	-0.42
Center	107	122	111	6.27	0.06	2.96
North-East	171	194	186	9.88	0.05	-3.03
South-East	268	334	306	26.97	0,09	-5.39
South-Muntenia	206	239	227	12.93	0.06	-3.68
Bucharest-Ilfov	4	13	8	4.19	0.55	-18.83
South-West Oltenia	236	253	243	7.43	0.03	-1.32
West	60	66	63	2.39	0.04	-1.01
Total	1,162	1,294	1,236	56.18	0.05	-2.66

Source: INSSE database, accessed 06.08.2025

During the period 2019-2024, the distribution of goat herds in Romania showed significant variations between development regions, highlighting both the zootechnical po-

tential specific to each area and the trends in the evolution of the goat sector at national level. Goat herds in Romania recorded a constant increase, with a national average of approximately 1,236 thousand heads and an annual rate of +2.65%.

The South-East region stands out with the largest herds, with an average of 306 thousand heads and a rapid annual growth of +5.39%, reflecting a dynamic goat sector with high potential. South-Muntenia recorded a stable evolution, with an average of 227 thousand heads and a growth rate of +3.68%, supported by favorable conditions and diversified agriculture. The North-East of the country reported an average of 186 thousand heads and an increase of +3.03%, due to pastoral traditions and a large rural population (Table no. 2).

In South-West Oltenia, the average livestock was 243 thousand heads, with a more modest increase of +1.32%, indicating a constant but slow development. The Center Region recorded an average of 111 thousand heads, with a pace of +2.96%, supported by the growing demand for goat milk products. In contrast, in the North-West a slight decrease in livestock was observed (-0.42%), with an average of 92 thousand heads, which shows a weaker orientation towards goat breeding. The West Region has small livestock, around 63 thousand heads, but with a modest increase (+1.01%). The Bucharest-Ilfov region has a very low herd (7,550 heads) and a high fluctuation, although the annual rate is high (+18.83%), this aspect being influenced by the small numerical base and the urban character of the area.

In conclusion, the analysis by regions of the evolution of goat herds in the period 2019–2024 shows that the sector is in sustained growth in most areas, with an emphasis on the Southeast, Southeast Muntenia and Northeast. Goat farming is becoming an increasingly viable alternative for small farmers, due to lower costs, growing demand and the adaptability of goats to various environmental conditions.

Table 3. Indicators regarding sheep and goat milk production in Romania, by development regions in the period 2019-2023

	Min	Max	Average	Deviation	C.var.*	Annual rate
	thousands of heads					
North-West	863	1,031	915	66.59	0.07	0.60
Center	1,075	1,335	1,159	109.76	0.09	2.79
North-East	884	1,046	959	74.07	0.08	1.32
South-East	1,146	1,181	1,162	14.67	0.01	0.67
South-Muntenia	764	833	792	36.09	0.05	-2.05
Bucharest-Ilfov	18	40	29	9.88	0.34	-17.04
South-West Oltenia	653	737	700	31.87	0.05	-0.95
West	598	694	639	37.76	0.06	1.85
Total	6,060	6,585	6,355	200.12	0.03	0.69

Source: INSSE database, accessed 06.08.2025

The third indicator analyzed concerns the production of sheep and goat milk, which is treated as a unit, as there are no separate official reports for each species. The statistical data provided by the National Institute of Statistics present this production in a cumulative form, which requires an aggregate approach at the level of interpretation. Consequently, the analyzed indicators together reflect the production resulting from the exploitation of both species, without the possibility of quantitative dissociation between sheep and goat milk. Sheep and goat milk production is an essential indicator for evaluating the performance of the sheep and goat sector in Romania, reflecting not only the size of the herds, but also the operating efficiency, the technological level and the capacity to capitalize on livestock production. During the period 2019–2024, an average annual production of 6,355 thousand hectoliters was recorded at the national level, with a minimum of 6,060 thousand hl and a maximum of 6,585 thousand hl. This narrow range and the relatively small coefficient of variation (0.03) indicate good stability of total production (Table 3).

The Center region has consistently been among the leaders in sheep and goat milk production, with an annual average of 1,159 thousand hl and a growth rate of +2.79%. The coefficient of variation, of 0.09, shows a slight fluctuation, but the overall evolution is positive. This performance can be explained by the existence of large herds, favorable pedoclimatic conditions and a consolidated milk processing network. The Southeast region stands out with an average production of 1,162 thousand hl, but with a much lower variability (C.var 0.01) and an annual rate of +0.67%. These data suggest a remarkable stability of the sector in this region, probably due to the efficient organization of farms and adaptability to market requirements. North-East Romania recorded an average of 959 thousand hl, with a positive evolution of +1.32% annually. The coefficient of variation (0.07) indicates a slight fluctuation, reflecting moderate changes in production conditions. The North-West of the country had an average production of 915 thousand hl and a moderate annual rate of +0.60%. The coefficient of variation (0.07) suggests a decent stability, but with a slight tendency to expand.

The region benefits from varied relief and solid traditions in animal husbandry, but investments are more modest compared to the Center or the Southeast. The West region presents an average of 639 thousand hl and a positive rate of +1.85%, with a coefficient of variation of 0.06, a sign that the sector is in a slow but sustained growth. Despite a relatively small number of goats in this region, the yield per head of animal or the modernization of farms could explain this favorable evolution. South-West Oltenia records an annual average of 700 thousand hl, with a slight decrease. The coefficient of variation (0.05) shows a relatively constant production, but the downward trend signals the need for interventions to stimulate farm efficiency and higher production value.

The South-Muntenia region produced, on average, 792 thousand hl, with a negative rate of -2.05%, which indicates a constant decrease during the analyzed period. Although the coefficient of variation (0.05) is moderate, the downward trend could be associated with the reduction of herds, the decrease in profitability in some areas or the reorientation of farmers to other activities.

The Bucharest-Ilfov region is, again, a special case: with a very low average production (29 thousand hl) and an extremely high fluctuation (C.var 0.34), the region faces instability and lack of specialization in the field. The negative annual rate of -17.04% suggests a strong contraction of the activity, which is to be expected in an urbanized area, where animal husbandry has a marginal role. Statistical data on sheep and goat milk production in the period 2019–2023 highlight a general trend of stability and slight growth at the national level, with some regional exceptions.

The Center, Southeast and Northeast regions assert themselves as the main production poles, both through the volumes generated and through the positive annual developments. On the other hand, South-Muntenia, Southwest Oltenia and Bucharest-Ilfov show significant decreases, which may reflect either structural changes in the holdings or economic and market difficulties.

3. CALCULATING THE BREAK-EVEN POINT

The cost of animal products is mainly determined by feed costs, which can reach weights of over 50-65%. Expenses are influenced by internal and external factors, such as market conditions and input prices, but feed remains the main cost component. Therefore, the increase in input prices, especially feed and energy, seriously affects profitability.

The lack of subsidies comparable to those in other European countries disadvantages Romanian farmers, limiting investments and technology. Reducing costs through efficiency, innovation and consumption optimization is the only viable solution for competitiveness.

At the national level, the main criterion is overall productivity, and at the farm level it is profitability. Profitability indicators are the most representative for evaluating economic performance, contributing to determining profit and the rate of return.

For the calculation of profitability in the case of sheep's milk, the technological estimate and the product budget were taken into account, for an average production of 60 liters/sheep. The structure of expenses reflects the average costs for maintaining an animal, expressed in lei/head. Expenses are divided into two large categories: variable expenses and fixed expenses, totaling lei 841.9/head.

The largest share is held by variable expenses, which amount to lei 673.5/head, representing approximately 80% of the total costs. Within these, the expenses for feed are the highest, respectively lei 543.7/head, i.e. over 64% of the total. This highlights the fact that animal feeding is the main cost element in a livestock farm.

Other significant variable expenses include biological material (lei 70/head), medicines and sanitary materials (lei 19.11/head), energy and fuel (lei 16.42/head), as well as smaller expenses related to supplies, insurance and other materials. Fixed expenses amount to 168.3 lei/head and include costs that do not vary directly with the number of animals, such as: labor (133.2 lei/head), interest on loans (23.6 lei/head), general administrative expenses (9.9 lei/head) and depreciation of fixed assets (1.6 lei/head).

This expenditure structure indicates an economic activity in which production costs are dominated by material and consumable resources, especially feed. Fixed costs are

relatively low, which offers a certain flexibility depending on the volume of production. In order to obtain a profit or to optimize the economic efficiency of the activity, rigorous control of feed expenses and efficient management of financial resources are essential.

The analysis of economic indicators related to the zootechnical activity highlights a balanced but fragile financial situation, in which profitability is essentially supported by the subsidies granted. The total value of the production obtained is 843 lei/head, the equivalent of 14.05 lei per liter of milk, but only 336 lei/head (5.60 lei/liter) comes from the main production, i.e. from the sale of milk. The difference is covered by secondary income and subsidies, the latter totaling 24.6 lei/head or 0.41 lei/liter.

Thus, the gross product, which cumulates the value of production and subsidies, reaches 867.6 lei/head, respectively 14.46 lei/liter. On the other hand, the total expenses associated with the activity are 841.9 lei/head, i.e. 14.03 lei/liter, which indicates a fragile balance between income and costs. The largest part of these expenses is represented by the variable ones, amounting to 673.5 lei/head (11.23 lei/liter), within which the costs of feed occupy a central place – 543.7 lei/head or 9.06 lei/liter.

Fixed expenses, amounting to 168.3 lei/head (2.81 lei/liter), are dominated by labor costs and interest on loans. The economic result is modest: taxable income is only 1.1 lei/capita, respectively 0.02 lei/liter, which means that the profit obtained from the activity, before the application of subsidies, is insignificant. Net income, including subsidies, amounts to 25.6 lei/capita or 0.43 lei/liter. Under these conditions, the taxable income rate is only 0.3%, and the net income rate with subsidies reaches 7.7%, indicating a low overall profitability.

The production cost of a liter of milk is estimated at 5.58 lei, and the selling price on the domestic market is 5.60 lei/liter. Thus, the gross profit from the sale of a liter of milk is only 0.02 lei, which demonstrates an extremely low margin. Without subsidies, the activity would be practically unprofitable.

Table 4. Budget for sheep milk product - average production 60 l/head

INDICATORS	Lei/head	Lei/literof milk
A. PRODUCTION VALUE	843,0	14,05
A1. Of which main production	336,0	5,60
B. SUBSIDIES	24,6	0,41
C. GROSS PRODUCT	867,6	14,46
D. TOTAL EXPENSES	841,9	14,03
D1. Of which for main production*	334,9	5,58
I. VARIABLE EXPENSES	673,5	11,23
1. Feed expenses	543,7	9,06
2. Biological material	70,0	1,17
3. Electricity + fuel	16,4	0,27

4. Medicines and sanitary material	19,1	0,32
5. Other material expenses	14,0	0,23
6. Supply quota	9,5	0,16
7. Insurance	0,8	0,01
II. FIXED EXPENSES	168,3	2,81
8. Labor expenses	133,2	2,22
9. General expenses	9,9	0,17
10. Interest on loans	23,6	0,39
11. Depreciation	1,6	0,03
E. TAXABLE INCOME	1,1	0,02
Taxes and fees	0,1	0,00
F. NET INCOME + subsidy	25,6	0,43
G. TAXABLE INCOME RATE (%)	0,3	0,3
H. NET INCOME RATE + subsidies (%)	7,7	7,7
COST OF PRODUCTION	334,9	5,58
DOMESTIC MARKET PRICE	336,0	5,60

Source: R. Chetroiu & all, 2020

The break-even point represents the minimum sales volume required for the farm to cover all costs and avoid losses. It can be calculated in value units (lei) or in physical units (liters) using the formulas:

Breakeven point in value units (lei) (Vâlceanu G. & all, 2004):

$$PR_{lei} = \frac{\text{Fixed expenses}}{1 - \frac{\text{Variable expenses}}{\text{Total income}}} = 841{,}9 \text{ lei} \quad (1)$$

In terms of value, the minimum income required to cover total expenses is 841.9 lei per head of animal. Only above this level does an effective profit appear.

Breakeven point in physical units (Vâlceanu G. & all, 2004):

$$PR_{fiz} = PR_{lei} / \text{ Price per liter} = 150{,}34 \text{ liters/animal} \quad (2)$$

This is approximately 150.34 liters/head, which means that any production below this level, at the current selling price, leads to financial losses. Reducing feed costs by 10% leads to a decrease in total costs per head from 841.9 lei to 787.53 lei, i.e. a saving

of 54.37 lei/head. As a result, the physical break-even point decreases from 150.34 liters to 140.63 liters/head, which means that the farm can become profitable at a lower milk production.

This adjustment has a significant impact on the farm's economic safety margin, providing a small buffer against potential risks. A 10% increase in feed costs has a negative effect on the economic balance, leading to an increase in total costs by 54.37 lei/head, respectively an increase in the physical break-even point by approximately 10 liters/head compared to the baseline situation. In practice, this means that the farm will have to produce more milk per animal, just to cover the new costs.

In conclusion, the activity under analysis operates close to the economic profitability limit, with a precarious balance between income and expenses. Profitability is ensured almost exclusively through subsidies, and volatility of market prices or a decrease in production can quickly turn this activity into an unprofitable one. Therefore, rigorous management of costs, especially those for feed, and an improvement in productive efficiency are necessary to ensure the economic sustainability of the farm.

The analysis of expenses related to goat raising reveals a complex cost structure, in which variable expenses predominate, but fixed expenses also have a significant share. The total value of expenses per head of animal is 1,612.9 lei, an amount that includes both direct costs related to the maintenance and production of goats, as well as indirect and administrative expenses. Of the total expenses, variable expenses amount to 894.1 lei/head, which represents approximately 55.4% of the total. Within these, the highest costs are associated with feed, which reach 757 lei/head, representing over 84% of the total variable expenses.

This aspect highlights the high dependence of the farm on the price and quality of feed, but also the importance of a balanced and economical ration. Other variable expenses include biological material (67.5 lei), energy and fuel (19.55 lei), medicines and sanitary materials (21.28 lei), as well as other material expenses, supply quota and insurance, all with modest values, but necessary for the daily operation of the farm.

Fixed expenses amount to 718.8 lei/head, i.e. 44.6% of the total costs. The largest share in this category is occupied by labor costs, amounting to 666 lei/head, which represents approximately 92.7% of fixed expenses and 41% of the total expenses per head. This highlights the fact that the zootechnical activity is labor-intensive, requiring constant involvement of personnel. General expenses, interest on loans and depreciation of equipment have a low share, but still reflect the existence of previous investments and administrative operating costs.

In conclusion, the structure of technological expenses for goat farming highlights an economic profile in which food and labor represent the main sources of cost. Optimizing these two components, through efficient feed rations and the technology of the activity, can have a significant impact on the overall profitability of the farm. Careful management of these expenses is essential to ensure the economic viability of the goat farm, especially in a competitive and volatile context in terms of input prices.

The economic analysis of the goat farm highlights a profitable activity, but dependent on strict cost control and the level of the capitalization price. The total value of pro-

duction per head of animal is 1,703 lei, which corresponds to an average of 6.31 lei/liter of milk, of which the main production, represented by goat milk, brings 1,269 lei/head, i.e. 4.70 lei/liter. This price level reflects an average capitalization of production in the context of the domestic market.

Feed costs represent an essential component in the cost structure of goat raising, having a direct impact on production profitability. In the analyzed case, the annual ration per goat amounts to 2,540 kg of feed, with a total value of 757 lei, which determines an average cost of approximately 0.30 lei/kg. From a quantitative point of view, green mass occupies the largest share in the diet, with 1,600 kg/head, i.e. almost 63% of the total feed, followed by succulents (450 kg) and hay (270 kg). In contrast, concentrated and coarse feed are administered in smaller quantities: 150 kg and 70 kg per goat annually, respectively. However, if we analyze the value structure of expenses, we observe that the ratio between quantity and cost is not always proportional.

Table 5. Goat milk product budget - average production 270 l/head

INDICATORS	Lei/head	Lei/liter of milk
A. PRODUCTION VALUE	1,703.0	6.31
A1. Of which main production	1,269.0	4.70
B. SUBSIDIES	24.6	0.09
C. GROSS PRODUCT	1,727.6	6.40
D. TOTAL EXPENSES	1,612.9	5.97
D1. Of which for main production*	1,178.9	4.37
I. VARIABLE EXPENSES	3.31	894.1
1. Feed expenses	757.0	2.80
2. Biological material	67.5	0.25
3. Electricity + fuel	19.5	0.07
4. Medicines and sanitary material	21.3	0.08
5. Other material expenses	15.2	0.06
6. Supply quota	12.7	0.05
7. Insurance	0.8	0.003
II. FIXED EXPENSES	718.8	2.66
8. Labor expenses	666.0	2.47
9. General expenses	13.2	0.05
10. Interest on loans	31.3	0.12
11. Depreciation	8.3	0.03
E. TAXABLE INCOME	90.1	0.33

Taxes and fees	9.0	0.03
F. NET INCOME + subsidy	105.7	0.39
G. TAXABLE INCOME RATE (%)	7.6	7.65
H. NET INCOME RATE + subsidies (%)	9.0	8.97
COST OF PRODUCTION	1,178.9	4.37
DOMESTIC MARKET PRICE	1,269.0	4.70
INDICATORS	Lei/head	Lei/liter of milk

Source: R. Chetroiu & all, 2020

Feed costs represent an essential component in the cost structure of goat raising, having a direct impact on production profitability. In the case analyzed, the annual ration per goat amounts to 2,540 kg of feed, with a total value of 757 lei, which determines an average cost of approximately 0.30 lei/kg. From a quantitative point of view, green mass occupies the largest share in the diet, with 1,600 kg/head, i.e. almost 63% of the total feed, followed by succulents (450 kg) and hay (270 kg). In contrast, concentrated and coarse feed are administered in smaller quantities: 150 kg and 70 kg per goat annually, respectively. However, if we analyze the value structure of expenses, we observe that the ratio between quantity and cost is not always proportional.

Total production-related expenses amount to 1,612.9 lei/head, or 5.97 lei/liter, of which the main production expenses are 1,178.9 lei/head, or 4.37 lei/liter – practically representing the production cost of one liter of milk. In the structure, variable expenses are dominant, amounting to 894.1 lei/head (3.31 lei/liter), with a share of approximately 55% of the total. Of these, feed expenses are the most important, representing 757 lei/head or 2.80 lei/liter, or over 84% of the total variable.

The other variable expenses, such as biological material, energy, medicines, sanitary materials and other miscellaneous expenses, are relatively small in weight, but necessary for the balanced functioning of the production system. For example, the expenses for medicines and sanitary materials are 21.3 lei/head (0.08 lei/liter), reflecting the concern for animal health, and energy and fuel – only 0.07 lei/liter – show a relatively low energy consumption, specific to goat farming.

Fixed expenses are also significant, totaling 718.8 lei/head (2.66 lei/liter), of which labor represents the majority component, with 666 lei/head or 2.47 lei/liter – that is, over 92% of fixed expenses. This figure confirms the labor-intensive nature of this type of farm, where many activities require manual or semi-mechanized intervention.

The economic result is positive: taxable income is 90.1 lei/head, respectively 0.33 lei/liter, which leads to a taxable income rate of 7.6%. If subsidies are also taken into account, the net income reaches 105.7 lei/head, respectively 0.39 lei/liter, and the net income + subsidies rate increases to 9%, a reasonable level for an agricultural activity. Comparing the production cost (4.37 lei/liter) with the market price (4.70 lei/liter), the result is a gross profit of 0.33 lei/liter, i.e. an acceptable economic margin, but relatively sensitive to price fluctuations or production variations..

This underlines the importance of rigorous management of costs, especially feed and labour, and highlights the vulnerability of the sector in the absence of subsidies or in the event of a decrease in the selling price. For a goat to cover all production costs (both variable and fixed), it must produce at least 343 litres of milk/year, at the current average price of 4.70 lei/litre. Below this threshold, the activity becomes unprofitable.

A 10% reduction in feed costs lowers the physical break-even point from around 343 litres to 327 litres/milk per goat/year, facilitating a faster profit and reducing pressure on production. Conversely, a 10% increase in feed costs raises the break-even point to 359 litres, meaning that higher production or a better price for milk is required to avoid losses.

For a farm with 1,000 heads, the break-even point is calculated for both sheep and goat farming to assess which activity is more profitable. For goats, the physical break-even point is 343,000 liters, and the value threshold is 1,612,900 lei. For sheep, the physical break-even point is 169,000 liters, and the value threshold is 842,000 lei. In comparison, goats require double the milk production to cover costs, but the total costs per head are almost double that of sheep.

Goats have a profit rate of approx. 9% with subsidies, and sheep approx. 7.7%. Although the breakeven point is higher for goats, they offer slightly higher profitability potential, due to better production and prices. Sheep have lower costs and a lower breakeven point, being more accessible and less risky.

In conclusion, for a farm of 1000 heads, goats can bring higher profits in the medium and long term. However, sheep farming is safer for farms with limited resources or unstable markets.

5. Conclusions

In order to ensure a balanced and sustainable development of the sheep and goat sector in Romania, it is necessary to adopt an integrated strategy that responds to both regional specificities and current economic, climatic and social challenges. Given the strategic importance of this sector for the rural economy, employment and food security, the proposed measures must aim to increase the competitiveness of farms and adapt to the requirements of the European market.

An essential step is to encourage investments in areas with high potential, good infrastructure and tradition in sheep and goat farming. Modernising farms and introducing advanced technologies can create successful models that can be replicated in other regions. In declining areas, tailored support is needed, through access to credit, subsidies and vocational training, to stabilise production and preserve traditional activities.

The modernisation of milk collection and processing infrastructure is also crucial, as the lack of adequate equipment limits farmers' access to competitive markets. Therefore, a coherent strategy for the development of this sector must be based on smart regional investments, differentiated support policies and modern infrastructure. Only through such an approach can a real balance be achieved between economic development, environmental protection and social cohesion in rural areas. Strengthening this sector will allow Romania to become a more competitive player on the European agri-food market and, at the same time, ensure the long-term sustainability of farms and agricultural communities.

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