Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 21, Issue 4, 2021
PRINT ISSN 2284-7995, E-ISSN 2285-3952

ANALYSIS OF ECONOMIC INDICATORS OF AGRICULTURAL HOLDINGS SPECIALIZED IN RAISING DAIRY COWS IN ROMANIA. CASE STUDIES

Cristina Maria STERIE, Rodica CHETROIU

Research Institute for the Economy of Agriculture and Rural Development, 61 Marasti Blvd., District 1, 011464, Bucharest, Romania, Phone: +4021.313.60.87, Fax: + 021.313.60.96, Emails: sterie.cristina@iceadr.ro, rodica.chetroiu@iceadr.ro

Corresponding author: sterie.cristina@iceadr.ro

Abstract

Economic indicators are key elements that indicate the current situation and economic performance of farms. The purpose of the study is to determine the main economic indicators and to analyze them comparatively, to determine the economic efficiency of dairy farms, depending on their area. The obtained results indicate that the farms in the plain area have the largest size and production, but the farms in the hill area have the highest profitability threshold. Farms in the mountain area are the least profitable, the position of the farm and the high costs confirm the difficulties of economic development of many farms in the mountains.

Key words**:** *economic indicators, profitability, farms, dairy cows, Romania*

INTRODUCTION

According to studies, worldwide, 85% of total milk is obtained from cows, the remaining 15% being obtained from other species. Also, in the European Union, Romania ranks 10th in terms of milk consumption, with 266.19 kg/inhabitant, the first places being occupied by Finland (361.19 kg/inhabitant), Sweden (355.86 kg/inhabitant) and the Netherlands (320.15 kg/inhabitant) [10].

The fragmentation of the dairy sector strongly affects the Romanian dairy market, thus, by 2020, almost 80% of dairy cows were found in very small farms, 1-2 heads. Also, since 2009, the sector has been in a continuous decline, on the one hand due to the reduction of cattle herds and on the other hand due to climate change which has affected feed production [6], [7].

The whole animal sector has also been affected by the European health conditions imposed by the EU, as well as by the economic crisis that has affected domestic consumption of both meat and dairy products [3], [9].

Cattle and farms of private, family, associative, commercial type are of special socio-economic importance in agriculture, requiring increased attention [1].

Value imports of milk increased in 2017 by about 50.95% compared to 2014, and quantitative imports increased by 74.8% compared to 2014, while the value of production fluctuated from year to year between 2010 -2016 [2].

Regarding the profitability of production, it can be adjusted by reducing the cost of production, which can be achieved by purchasing fodder at lower prices, or by mechanizing work that requires a large volume of physical labor, such as milking or transporting fodder [8], [5].

The purpose of the study is to determine the main economic indicators and to analyze them comparatively, to determine the economic efficiency of farms depending on their area.

MATERIALS AND METHODS

The data collected and analyzed in this paper come from 54 agricultural holdings specializing in milk production, of which 24 from the plain area, 14 from the hill area, and 16 from the mountain area. Based on the data provided from the farms, it was possible to

determine: their economic size, the different categories of expenses, the production cost, the production value, the profitability threshold, the exploitation risk rate, etc. In this paper, the average values calculated based on data from 2018-2020 were highlighted, grouped according to the relief areas.

The analyzed agricultural holdings are part of the counties: Teleorman, Ilfov, Călăraș, Olt, Arad, Iași, Prahova, Hunedoara, Botoșani, Sălaș, Cluj, Vâlcea, Gorj, Buzău, Maramureș, Alba Iulia and Sibiu.

RESULTS AND DISCUSSIONS

In the case of the analyzed farms in the plain area, 14 of them have an economic size between 8,000 and 49,999 SO, 9 farms have an economic size between 50,000 and 999,999 SO, and only one has a size between 2,000 and 7,999 SO, being part from the category of semi-subsistence farms (Table 1).

Table 1. Determining the economic size of farms by relief areas

Value S.O	Under 1,999 euro	2,000 - 7,999	8,000-49,999	50,000-999,999	Over 1,000,000 euro	TOTAL
Plain	0	1	14	9	0	24
Hill	7	0	4	3	0	14
Mountain	0	0	13	3	0	16
TOTAL	7	1	32	15	0	54

Source: Author's calculations.

In the hill area, out of the total of the 14 agricultural holdings analyzed, 7 of them have an economic size below 2,000 SO, 4 farms have an economic size between 8,000 and 49,999 SO, and 3 farms have a size between 50,000 and 999,999 SO (Table 1).

Analyzing the farms in the mountain area, we notice that the economic size between 8,000 and 49,999 euros predominates for 13 farms analyzed, and among those with an economic size between 50,000-999,999 euros, 3 farms were analyzed (Table 1).

Analyzing the size of the farms, depending on the size of the herds, an average of 103 heads is observed in the plain area, while in the hill area an average of 76 heads/farm were registered, and in the mountain area, on average 27 of heads/holding. In the case of the plain area, the herds ranged between 6 and 511 heads, while in the hill area, the herds ranged between 5 and 568 heads. Lowest size of herds cows were recorded in the mountain area, ranging between 7 and 27 heads (Fig. 1).

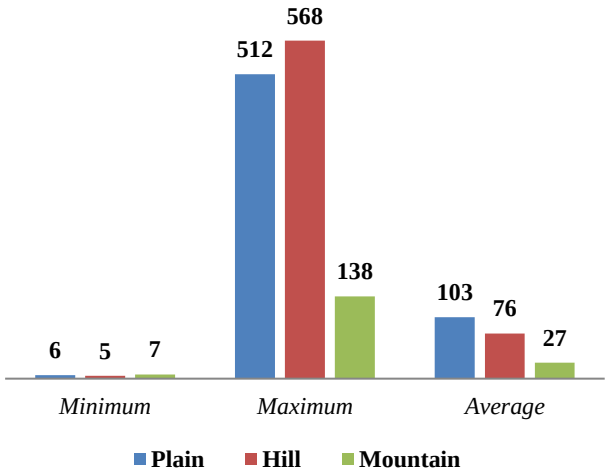

Fig. 1. Size of farms according to relief area (heads)
Source: Author's calculations.

It is observed that the average number of dairy cows in the mountain area (27 heads) is lower by 73% compared to the average number in the plain area (102 heads), respectively by 63% compared to the average number in the hill area (75 heads). The plain and hill areas have larger herds in terms of livestock, compared to the mountain area, due to the large grazing areas and those for cereals (Fig. 1).

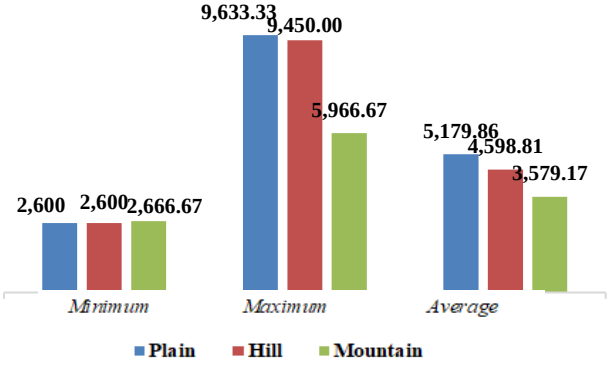

Fig. 2. Accent the average production by relief area (l/head)
Source: Author's calculations.

according to the data collected, the average production in the plain area ranged between 2,600 l and 9,633 l, with an average of 5,179 l/cow, showing values close to the average

productions recorded in the hill area, between 2,600 l and 9,450 with an average of 4,598 l/cow (Fig. 2).

The total milk production oscillated in the plain area between 30.60 thousand l/farm and 4,929.06 l/farm, with an average of 711.30 thousand l/farm. It is observed that the total production registered in the hill area presents values close to those of the plain, thus the limits are between 27.90 l/farm and 5,370.75 l/ arm, with an average of 532.09 thousand l/farm (Fig. 3).

The average total milk production on the farm, registered in the mountain area was 120.24 thousand l/farm, lower by over 83% compared to the total production registered on the plain, respectively by over 77% compared to the average registered in the farm area. hill.

The average total milk production in the mountain area is much lower compared to the plain and hill area due to the small number of herds and the existing rustic breeds, with low productions (Fig. 3).

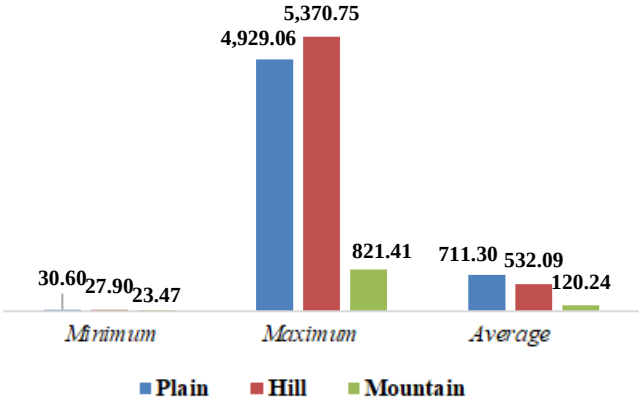

Fig. 3. Total milk production by relief area (thousand l/farm)
Source: Author's calculations.

In the hill region, the value of production was 1.85 lei/l, representing the highest average of the period between the 3 landforms analyzed, more than 14% compared to the average value of production recorded in the plain region and approximately 4% compared to the mountain region.

Table 2. Determination of the value of production, the value of main production and the capitalization price according to the relief area

Specification	Plain			Hill			Mountain		
	U.M: lei/l								
	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
Production value	1.29	2.70	**1.62**	1.34	3.81	**1.85**	1.46	2.73	**1.78**
The value of the main production	1.17	2.60	**1.48**	1.10	3.67	**1.68**	1.23	2.58	**1.59**
Capitalization price	1.17	2.60	**1.48**	1.10	3.67	**1.68**	1.23	2.58	**1.59**

Source: Author's calculations.

Regarding the limits of the production value, it is observed that they are higher in the mountain area, compared to the plain area, the minimum production value being 1.46 lei/l, and the maximum being 2.73 lei/l milk, in while in the plain area the limits are 1.29 lei / l and 2.7 lei/l of milk.

Regarding the capitalization price, it is observed that the average (1.48 lei/l) is lower by about 7% compared to the average price of mountain milk (1.59 lei/l). The high price of milk obtained in the mountain area, compared to milk obtained in the plain area is due to the higher cost of concentrated feed, transport costs, but also the capitalization of milk as a primary processed product on the farm (Table 2).

The break-even point is the point at which turnover covers variable and fixed operating expenses, calculated in physical or value units for a product or the entire activity.

Analyzing the profitability threshold on the 3 relief areas, for the analyzed farms, it is observed that the hill area has the highest average profitability threshold (9,661.42 lei), higher by 24.9% compared to the average profitability threshold registered in the plain area (7,735.99 lei) and by 37.5% compared to the average registered in the mountain area (7,026.06 lei). It is thus found that the farms

in the hill area are more profitable compared to the farms in the mountain area, where the expenses are much higher, and where the economic results are negative (Fig. 4).

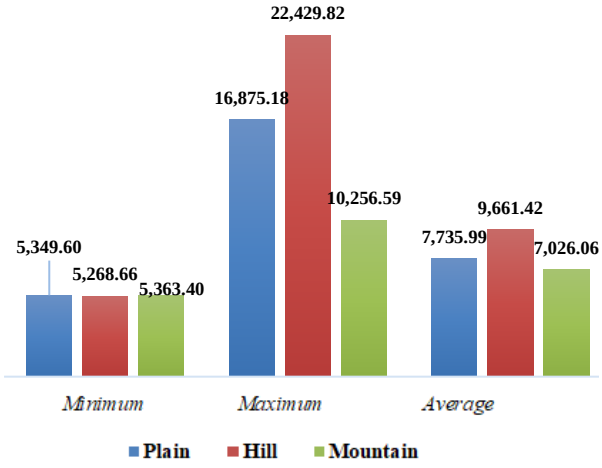

Fig. 4. Determining the break-even point in PR* value units according to the relief area (lei)
Source: Author's calculations
* break-even point.

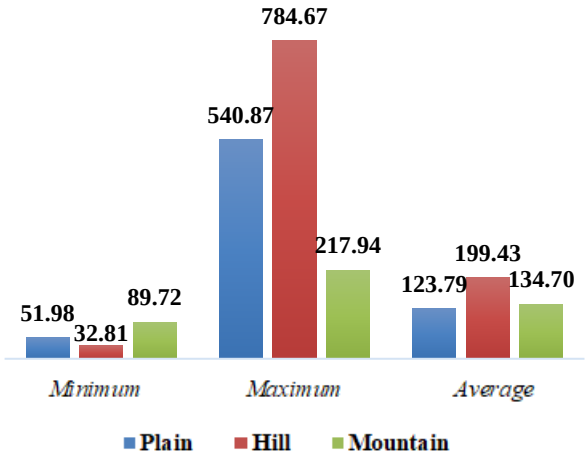

Fig. 5. Determination of the exploitation risk rate according to the relief area (%)
Source: Author's calculations.

The exploitation risk expresses the adaptability of the farm with the lowest cost to the variations of the economic conditions, such as the purchase prices, the accentuation of the competition, the loss of the sales market.

Analyzing the rate of risk of exploitation of farms in the 3 relief areas, it is observed that the average of this indicator in the hill area is 199.43%, 64.73% higher than the average recorded in the plain area and 64.73% compared to the mountain area (Fig. 5).

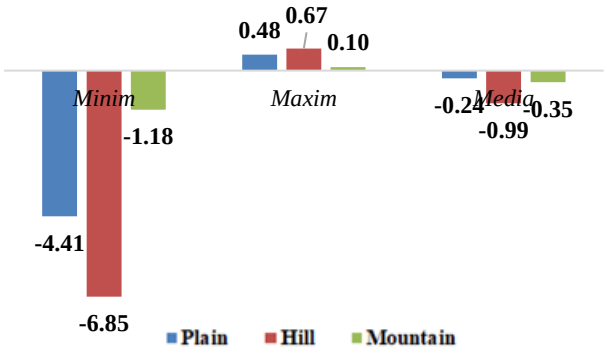

Fig. 6. Determination of the exploitation risk rate according to the relief area (%)
Source: Author's calculations.

Analyzing the security index on the 3 relief areas, it is found that the average for the 3 years analyzed is negative. Thus, in the hill area the lowest security index is registered, -0.99, being followed by the mountain area with -0.35, while the plain area has a security index of -0.24 (Fig. 6.).

CONCLUSIONS

The obtained results indicate that the farms in the plain area have the largest size and production, but the farms in the hill area have the highest profitability threshold. The farms in the mountain area are the least profitable. The position of the farm, as well as the high costs confirm the difficulties of economic development of many farms in the mountain area.

Although in terms of quality, milk from farms located in the mountain area is higher than that from the plain or hill area, mainly due to the food consumed by cows with high nutritional values, the size of dairy cows it is significantly lower than in the other two regions. Also, in these areas, transportation costs for materials, supplies, or delivery are higher, especially in areas with more difficult accessibility.

On average, agricultural holdings specializing in raising dairy cows in the plain area record higher yields than in the case of other

landforms, which is mainly determined by the farming system; thus, in the plain, intensive farms predominate, with cow breeds specialized in milk production.

When determining the profitability threshold, in farms in the hill area, this indicator shows significantly better values than in the case of farms in the plain and mountain area, as this area combines the advantages found in the other two areas, both by the existence of good breeds. milk producers, as well as through the possibility of capitalizing on the existing resources in the hill area (pastures and hayfields).

The creation of groups of producers or cooperatives in the dairy sector can probably be one of the best solutions to increase the profitability of these farms, especially among subsistence and small or medium-sized ones.

ACKNOWLEDGEMENTS

The paper is part of the results of research conducted under the ADER project 24.1.2 "Research on the economic efficiency of raising sheep, goats, dairy and beef cattle and buffaloes", Phase 3 "Economic efficiency of cattle and buffalo farms of different sizes, located in different geographical regions and landforms", funded by the Ministry of Agriculture and Rural Development. [4]

REFERENCES

[1]Chetroiu, R., Iurchevici, L., Marin, A., Cofas, E., Cișmileanu, A., 2020, The economic efficiency of the animal breeding sectors - context and evaluation, Ceres Publishing House, Bucharest, pp.15-20.

[2]Chiurciu, I. A., Soare, E., 2019, Cow milk route from Romanian dairy farms to market, Conference: X International Scientific Agriculture Symposium, Agrosym 2019.

[3]Grigoras, M.A., 2016, Trends in Romania animal production, Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 16(4):137-148.

[4]ICEADR, 2021, ADER Project 24.1.2 - Research on the economic efficiency of raising sheep, goats, dairy and beef cattle and buffaloes, Phase 3.

[5]Isfănescu, A., Stănescu, C., Băicuși, A., 1999, Economic-financial analysis, Economic Publishing House, Bucharest, pp. 30-33.

[6]Popescu, A., 2017, Trends in milk market and milk crisis impact in Romania, Scientific Papers. Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 17(2):281-290.

[7]Popescu, A., 2014, Research on milk cost, return and profitability in dairy farming, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol 14(2):219-222.

[8]Sandu, M., Florea, G., Paraschivescu, M., 2014, Bioeconomical research on biodiversity of animal food resources in Romania, University of Bucharest, Romanian Biotechnological Letters Vol. 19(4):9597-9604.

[9]Sandu, M., Sandu, S., Paraschivescu, M., 2015, Evolution of Romanian livestock from the perspective of avability of food products, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 15(2):321-326.

[10]Sawe, B. E., 2018, Countries Who Drink the Most Milk, World Atlas, Jan. 17, 2018, worldatlas.com/articles/countries-who-drink-the-most-milk.html, Accessed on 19.09.2021.