

Economic effect evaluation of rearing sheep of the Copper-red Shumen breed

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Abstract

Slavova, S., Staykova, G., Laleva, S., Popova, Y. & Slavova, P. (2020). Economic effect evaluation of rearing sheep of the Copper-red Shumen breed. *Bulgarian Journal of Agricultural Science, 26(4), 726–730*

The purpose of the present research is to examine the economic effect of rearing Copper-red Shumen sheep. Subject of the study is a flock under selection control, as the economic data refers to the period from 2015 to 2017. Sheep are kept in stall-pasture regime at semi-intensive productive system. Feeds are of own production and the ewes are milked by hand. Revenues and costs have been evaluated at current market prices. Profit per ewe and cost-efficiency have been calculated as indicators of the economic effect of production. Data has been provided by the farmer and the accountancy of the farm. Production costs far exceed gross production, which is an indication of the insufficient level of productivity in the farm. Subsidies have the highest relative share of the total revenues – 60.36% on average, i.e. economic results strongly depend on their size. Cost-efficiency rate averages 52.89%, so that sheep farming is effective according to the particular parameters of the conducted study. There is a negative trend in profit with subsidies per ewe – from BGN 123.42 to BGN 68.60, mainly as a result of the growing production costs.

Keywords: sheep farms; costs; revenues; profitability

Introduction

Autochthonous sheep represent a valuable genetic resource for each country's agriculture. Because of the comparative advantages these animals possess – unpretentious, resistant and having long productive lifetime, European policy is aimed at their preservation. The local breeds are suitable for organic production as their products are ecologically clean, with unique character and excellent taste. In addition, they are a source of genes to improve the sustainability and adaptability of modern cultural breeds and populations. Their conservation is of great importance for all the Member States of the European Union in economic, social and environmental terms.

Approved in 2003, the Reform of the Common Agricultural Policy has led to slowing down the rate of flock reduction. It is aimed at maintaining biodiversity and encouraging

the production of high-quality food products from endangered populations (Canali et al., 2006).

Preservation of this genetic resource can hardly be done without adequate support for the farmers. In this respect, the newly introduced subsidy schemes in Bulgaria have had a positive impact on the number of indigenous sheep populations in the country, which has increased in recent years. Subsidies are a major motivating factor for the breeding of local breeds because they represent a high proportion of gross farm incomes.

The Copper-red Shumen breed is autochthonous, with regional significance and areal mainly in Northeastern Bulgaria. According to the latest data from the National Register of the Executive Agency for Selection and Reproduction in Animal Breeding, around 10,000 sheep of the breed are raised in the country. Studies on the genetic and pheno-

typic characteristics of the breed have been conducted by a number of authors from the beginning of the past century – Tonchev (1924), Ganchev (1926), Aleksieva (1979, 1987), Aleksieva et al. (1995), Nakev (1977), Stankov et al. (1995), Boykovski (2003), Panayotov et al. (2003), Tyankov et al. (2003), Nedelchev & Stoyanov (2004), Nikolov (2004), Staikova (2004, 2005), Stancheva et al. (2009).

The economic efficiency of rearing sheep from the Copper-red Shumen breed is a subject of the study by Laleva et al. (2008). The authors found that, at a rate of profitability of costs (-41.13%), production was ineffective and the selection should be directed to increasing the number of lambs realized. Popova et al. (2008) received similar results for another local breed – Karnobat sheep breed.

In the current market conditions, at the presence of adequate financial support from the state, agri-environment payments and subsidizing of the sheep under selection control, there are no detailed studies of the economic results of rearing sheep of this breed in Bulgaria.

The aim of the present study is to examine the economic effect of rearing sheep from the Copper-red Shumen breed.

Material and Methods

The subject of the study is a sheep flock and the corresponding categories rams, ewe and ram lambs of the Cop-

Table 1. Mean values of the basic productive traits in ewes of Copper-red Shumen breed

Productive traits	2015 n*=419	2016 n*=439	2017 n*=496
Mature weight, kg	47	47	48
Average litter size per lambing ewe, n	1.11	1.21	1.16
Wool yield, kg	2.6	2.8	2.8
Milk yield, l	38	44	42

*n is the number of ewes in the flock in the relevant year

Table 2. Gross production (GP), BGN

Revenues	2015			2016			2017		
	kg/n	price/kg,n	total, BGN	kg/n	price/kg,n	total, BGN	kg/n	price/kg,n	total, BGN
From milk	6 054	1.30	7 870.20	10 441	1.30	13 573.30	12 076	1.30	15 698.80
From sold animals	–	–	30 383.70	–	–	38 396.00	–	–	43 024.00
– lambs for slaughter	4 687	5.10	23 903.70	5 966	5.00	29 830.00	6 750	5.20	35 100.00
– breeding lambs	900	6.00	5 400.00	971	6.00	5 826.00	780	6.00	4 680.00
– culled ewes	240	2.00	480.00	320	2.00	640.00	672	2.00	1 344.00
– breeding rams	2	300.00	600.00	7	300.00	2 100.00	5	300.00	1 500.00
– culled rams	–	–	–	–	–	–	2	200.00	400.00
From wool	1 350	0.70	945.00	1 500	0.70	1 050.00	1 600	0.50	800.00
Total GP:	–	–	39 198.90	–	–	53 019.30	–	–	59 522.80
GP/ewe	–	–	93.55	–	–	120.77	–	–	120.00

per-red Shumen breed for the period of three years (2015–2017). The farm is owned by a farmer and is located in the areal of the breed (Northeastern Bulgaria). Animals are reared at stall-pasture regime at a semi-intensive productive system. The breeding process takes place once a year during the oestrus season. Ewes are mated at the 18 months of age after a basic examination and formation of the flock. The mean values of the productive traits (mature weight, average litter size per lambing ewe, milk yield and wool yield) are presented in Table 1.

Revenues and costs have been evaluated at current market prices. Profit per ewe and cost-efficiency have been calculated as indicators of the economic effect of production. Information for the economic analysis is provided by the farmer and the accounting company, which is committed to serving the farm.

The data are processed with a mathematical-statistical model and an Excel computer program.

Results and Discussion

The Gross production (GP) is presented in Table 2, as revenues are from milk, slaughter and breeding lambs, and wool. Prices of the main products are relatively constant during the analyzed period. The price of wool is traditionally low, with a decrease of 0.20 BGN over the last year compared to the previous one.

The Gross production from milk and sold animals increases during the study, and that of wool decreases. Revenues from milk grow from BGN 7870.20 in 2015 to BGN 15698.80 in 2017, due to the significantly higher quantity of realized product at a constant price of BGN 1.30. Revenues from sold animals also increase – from BGN 30383.70 at the beginning of the period to BGN 43024 at the end, i.e. about 42%, mainly as a result of the higher number of lambs for slaughter. This is due to the increased size of the main flock

(from 419 to 496 ewes) and the higher average litter size per lambing ewe (1.21) in 2016. The declining market price of wool from BGN 0.70 to BGN 0.50 at the end of the period is the reason for the reported decrease in its revenues, despite the higher realized quantity. The result obtained is consistent with the tendency for the wool to be sold at an extremely unattractive price in recent years.

The subsidies for the period of the study and the amount of Total revenues are shown in Table 3. Total revenues (TR) represent the sum of GP and subsidies. The farm receives subsidies under the Scheme for supporting ewes under selection control, as the rate per ewe is being the lowest for 2016 – BGN 47.10, so that the amount paid is the smallest – BGN 20676.90. Support is also introduced under the Scheme for Implementation of Extensive Production Methods at the amount of BGN 3.27 per animal. The owner manages pastures, so he also receives subsidies under the Area Payment Scheme (Subsidies for pasture). National payments connected to production were paid in 2015 and 2016, and “De minimis” payment for the entire period.

The structure of the Total revenues in the farm is shown in Figure 1. The total wool production has an extremely low value and is therefore not included. Subsidies stand out with the largest share – 60.36% on average over the period, followed by livestock sales (25.83%–31.39%) and milk (6.7%–11.45%). The total production of sold animals and milk increases in value terms, which also reflects their relative share in the revenue structure. On the contrary, subsidies are slightly falling down, but in general the economic outcome remains highly dependent on their size.

The production costs in the farm are presented in Table 4. An increase trend for the studied period is observed both in the Fixed (FC) and in the Variable costs (VC). The increasing size of the flock leads to higher costs of animal registration and care at the Breed Association, which are BGN 4 per animal for the period 2015–2017. The other FC also increase, according to the farm accountancy data. The ratio VC/FC is about 90%/10%. Costs for feed, medication, veterinary ser-

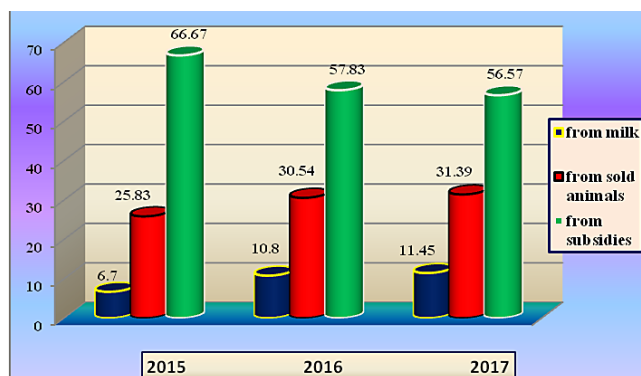


Fig. 1. Structure of total revenues, %

vices and pasture maintenance report growth, which is again related to the increase in flock size, hence the need for feed, consumables, prophylaxis and treatment. At the same time, the size of pastures for which the farm receives subsidies and for which support is needed is increasing.

All of the given factors are in direct dependence to the increased need for labor and higher wages and social security costs. Analyzing the primary data, we could refer to feed as the main production cost, as its value reaches 40–41% of that of VC, although it is of own production and is valued at cost. Labor costs also have a significant size and reach 35–36% of VC. Thus, the cost of feeding and caring for animals accounts for 75–77% of the farm’s Variable costs. All other VC are of secondary importance and their total value ranges from 23% to 25%.

The economic outputs of the production – profit per ewe and cost-efficiency in % without and with subsidies (Table 5), are considered as the main criteria for the efficiency of each production activity.

Profit without subsidies has a negative value over the studied period, i.e. production in the farm on the basis of realized sheep products is losing. Production costs significantly exceed the size of GP per ewe, which means that the productivity of the animals is not high enough to compen-

Table 3. Revenues from subsidies and Total Revenues, BGN

Subsidies	2015	2016	2017
For ewes under selection control	28 492.00	20 676.90	36 544.00
National payments, connected to production	17 724.30	18 316.00	-
Agro-ecology	24 997.68	19 768.50	21 505.68
De minimis	3 157.00	2 892.00	2 010.00
Payments for application of extensive production methods	-	-	1 742.00
Payments for pasture	4 050.00	11 061.00	15 728.00
Total subsidies, BGN	78 420.98	72 714.40	77 529.68
Total Revenues (TR)	117 619.88	125 733.70	137 052.48
TR/ewe	280.71	286.41	276.32

Table 4. Costs, BGN

Costs	2015	2016	2017
1.Fixed costs	5 254.00	5 824.00	6 231.00
1.1.Membership fees in associations	1 804.00	1 928.00	2 144.00
1.2.Accounting costs	2 400.00	2 640.00	2 700.00
1.3.Other costs	1 050.00	1 256.00	1 387.00
2.Variable costs	60 651.64	79 604.21	96 794.45
2.1.Feeds	24 841.45	32 611.05	39 021.10
-concentrates	15 250.80	18 150.40	23 250.50
-silage	4 340.20	6 120.50	7 890.00
-roughage	2 250.45	3 340.15	3 780.60
-other	3 000.00	5 000.00	4 100.00
2.2.Medicaments	450.80	640.20	739.60
2.3.Veterinary service	591.90	665.40	750.00
2.4.Electricity	1 469.55	1 335.30	1 513.75
2.5.Mechanization and repair	1 200.00	1 600.00	1 500.00
2.6.Transport	400.00	500.00	500.00
2.7.Fuels	1 327.20	1 959.60	1 783.48
2.8.Materials	1 362.70	1 545.45	1 418.95
2.9.Other external services	2 960.00	3 655.00	3 615.40
2.10.Water	1 200.00	1 200.00	1 300.00
2.11.Costs for maintaining pasture	2 500.00	6 600.00	10 000.00
2.12.Labour costs	22 348.04	27 292.21	34 652.17
-Salaries	18 967.25	22 877.16	26 650.20
-Insurance	3 380.79	4 415.05	8 001.97
3.Total costs (FC + VC)	65 905.64	85 428.21	103 025.45
4.Total costs/ewe	157.29	194.59	207.71

Table 5. Economic results of production

Indicators	2015	2016	2017
Profit without subsidies, BGN	-26 706.74	-32 408.91	-43 502.65
Profit without subsidies, BGN/ewe	-63.74	-73.82	-87.71
Profit with subsidies, BGN	51 714.24	40 305.49	34 027.03
Profit with subsidies, BGN/ewe	123.42	91.81	68.60
Rate of profitability of costs without subsidies, %	-40,52	-37.93	-42.23
Rate of profitability of costs with subsidies, %	78.46	47.18	33.03

sate for the costs incurred for rearing. The negative results for production efficiency are also confirmed by the rate of cost-efficiency ranging from -42.23% (2016) to -37.93% (2017). Similar results reported by Laleva et al. (2008) in a flock of 200 ewes from the Copper-red Shumen breed. With a yield of milk of 30 l/ewe per year and average litter size per lambing ewe 1,1, the cost-efficiency is -41.13%.

Profit with subsidies has positive value but tends to decrease during the study – from BGN 123.42 per ewe to BGN 68.60 per ewe. This is due to the progressively rising costs for the period and the decreasing Total revenues per ewe for the last year. Against the background of the growing number of ewes

– from 419 to 496, the cost-efficiency with subsidies declined by 78.46% (2015) to 33.03% (2017). Despite this trend, the indicator is 52.89% on average over the period, i.e. production of the farm is cost-effective in the particular conditions. However, it should be taken in mind that subsidizing of the Copper-red Shumen breed as an autochthonous breed and the newly introduced Support Scheme for animals under selection control create more opportunities for farmers to keep their production viable at relatively lower levels of productivity.

In conclusion, the following conclusions could be drawn:

1. Production costs far exceed Gross production, which is an indication of the insufficient level of productivity.

2. Subsidies have the highest relative share of the Total revenues – 60.36% on average, i.e. economic results in the farm strongly depend on their size.

3. Cost-efficiency rate averages 52.89%, so that sheep farming is effective according to the particular parameters of the conducted study.

4. There is a negative trend in profit with subsidies per ewe – from BGN 123.42 to BGN 68.60, mainly as a result of the growing production costs.

Acknowledgements

The publishing of the present scientific paper is co-financed by National Science Fund, contract No. 01/19 from 23.08.2017.

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Received: December, 20, 2018; Accepted: January, 4, 2019; Published: August 31, 2020