

ECONOMIC EFFICIENCY OF BREEDING DAIRY SHEEP IN THE MOUNTAIN AND HILLY REGIONS OF BULGARIA

Y. Popova, S. Slavova, S. Laleva, D. Yordanova, T. Angelova, P. Slavova, J. Krastanov

Agricultural Institute – Stara Zagora, BG – 6000, Stara Zagora, Bulgaria
Corresponding author: ympopova@abv.bg
Original scientific paper

Abstract: Sheep breeding is an important means of livelihood for the population living in the mountain and hilly regions of the country. The object of the present study is to analyze the economic efficiency of breeding dairy sheep in the mountain and hilly regions of Bulgaria. Object of the study are 2 models of farms with 100 ewes from the dairy type and the relevant categories lambs and rams. We compare and analyze two levels of milk productivity – 70 l per lactation in the first farm and 100 l per lactation in the second farm. The whole grain and roughage necessary for feeding ewes are calculated while hay is self-provided. The average fertility per ewe is 115%, the average wool yield is 2.2 kg and the repair of the flock is 20%. Incomes and costs are estimated at current prices for the 2013 – 2014. It was found that in the terms of the present study we may draw the conclusion that in case the farmer is not getting subsidy from the State Fund “Agriculture” will be efficiently to raise only ewes that have milk productivity 100 l per lactation; in support of the farm subsidies by the State Fund "Agriculture" and the two levels of milk production is appropriate breeding of dairy sheep in the mountainous and hilly regions of the country; in order to improve the economic efficiency farmers should pay attention to increasing the fertility of ewes and protection of the new-born lambs as well as increasing of milk productivity of ewes.

Key words: sheep-incomes-costs-profit-milk production

Introduction

Sheep breeding is an important means of livelihood for the population living in the mountain and hilly regions of the country. The favorable climate and forage conditions appear to be economic incentive for developing this industry because of

the rich pasture available, which helps reducing the costs for feeding animals. Unfortunately, in these regions there is a strongly declined demographic structure and, namely, ageing and depopulation of the villages. In consequence, the number of people breeding sheep strongly decreases. One of the factors for some overcoming this process is creating conditions for development of the small and medium-sized agribusiness. Because of the crisis in sheep-breeding is mostly economic, it can be overcome only by using economic mechanisms and particularly by creating better conditions for the sheep farms to work.

According to *Ozkan et al. (2009)* in terms of dynamic and competitive market only the most efficient agricultural producers will generate profit and survive. A farm is economically efficient when the total value of production overbalances production costs and there is an optimization of costs per production unit (*Tauer and Belbase, 1987*).

According to *Georgiev (1990)*, economic efficiency in sheep breeding is a dynamic category where the results received and costs made as well as the factors generating them are variable measures.

A number of authors investigate economic efficiency of sheep breeding. *Stankov (2000)* analyse farms raising dairy sheep, merino sheep and meat-type sheep. According to them, to find the economic optimum where a unit of production growth is received by the lowest growth of costs is necessary to optimise the function forage-productivity.

In our previous study we analyzed economic efficiency of dairy and meat-type sheep farms in the intensive regions of the country (*Popova et al., 2007*). We established that in the dairy sheep farms there was a higher income generated and higher costs but lower efficiency of production.

Odzhakova et al. (2009) studied the economic efficiency of breeding Karakachanska breed and *Popova et al. (2011)* analyzed the economic efficiency of processing cow and sheep milk produced in the farm of OSZJ – Smolian. As a result the authors concluded that breeding sheep from the Karakachanska breed is not efficient without financial support from the state.

Mihailova-Toneva (2001) studied economic efficiency of breeding sheep from the Synthetic population Bulgarian Milk sheep in the flock of Institute for animal sciences in Kostinbrod. The biggest share in the structure of costs is that of costs made for providing forage – 75%. The incomes from market lambs and milk are approximately one and the same as relative part of the total income – about 25%. The subsidy received per year is 1/3 of the total income for the flock. The income per ewe is 110 BGN.

The object of the present study is to analyze the economic efficiency of breeding dairy sheep in the mountain and hilly regions of Bulgaria.

Materials and Methods

Object of the study are 2 models of farms with 100 ewes from the dairy type – Synthetic population Bulgarian Milk sheep and the relevant categories lambs and rams. We compare and analyze two levels of milk productivity – 70 l per lactation in the first farm and 100 l per lactation in the second farm. During the winter period (180 days) sheep are hand-fed as follows – 0.600 kg concentrate mixture, 2 kg roughage and 1 kg hay per ewe daily. During the summer period (180 days) animals are grazing. Before and during the mating period /about 45 days/ a ewe is given 0.300 kg hay daily. The whole grain and roughage necessary for feeding ewes are calculated while hay is self-provided. The average fertility per ewe is 115%, the average wool yield is 2.2 kg and the repair of the flock is 20%. There is only one person responsible for serving the sheep in the farm and another one to herd on the sheep on during the milking procedure. Milking is made by hand. Incomes and costs for 1 year are estimated at current prices for the 2013 – 2014.

Results and Discussion

The necessary quantities for feeding the animals are represented on table 1. The biggest share of the costs is for concentrate mixture – 64.51% /I option/ and 66.41% /II option/ and roughage – 27.12% and 25.67%. The quantity of concentrate mixture needed for reaching milk production rate of 100 l per lactation increased 8.75% compared to the quantity necessary for the rate of 70 l. Totally, the costs for forage increases 5.65% in case where the milk productivity is higher.

Table1. Necessary feeds for 1 year

Forage	Quantity, kg		Value, BGN	
	I option	II option	I option	II option
Silage	24000	24000	4080	4080
Meadow hay	21940	21940	1097	1097
Concentrate mixture	20224	21994	9707	10557
Starter mixture	180	180	162	162
Total	66344	68114	15046	15896

On table 2 production costs are represented. Costs made for fodder take the biggest portion – 62.83% /I option/ and 64.11% /II option/ followed by costs for labour – 28.06% /I option/ and 27.10% /II option/. Production costs in case where the milk production is expected to be 100 l per lactation are 3.55% higher which means 850 BGN additionally.

Table 2. Production costs, BGN

Indices	Value, BGN	
	I option	II option
Feeds	15046	15896
Labour costs	6720	6720
Water, Elec. energy, Fils	800	800
Medical costs	650	650
Amortization	400	400
Other costs	330	330
Total	23946	24796

The incomes from production are represented on table 3. The biggest part of income is coming from to the market lambs – 51.08% /I option/ and 47.44% /II option/. Incomes from the sale of milk take significant part – respectively 38.42% /I option/ and 42.82% /II option/. Incomes from sheep rejected and market wool is insignificant – respectively 10.49% and 9.74%. Therefore, the farmers should pay special attention to increasing fertility of ewes and protection of the new-born lambs and improving milk productivity.

Table 3. Incomes, BGN

Production	Quantity, kg		Value, BGN	
	I option	II option	I option	II option
Milk	7000	8400	9100	10920
Lambs	2200	2200	12100	12100
Waste Sheeps	1000	1000	2000	2000
Wool	220	220	484	484
Total	10420	11820	23684	25504

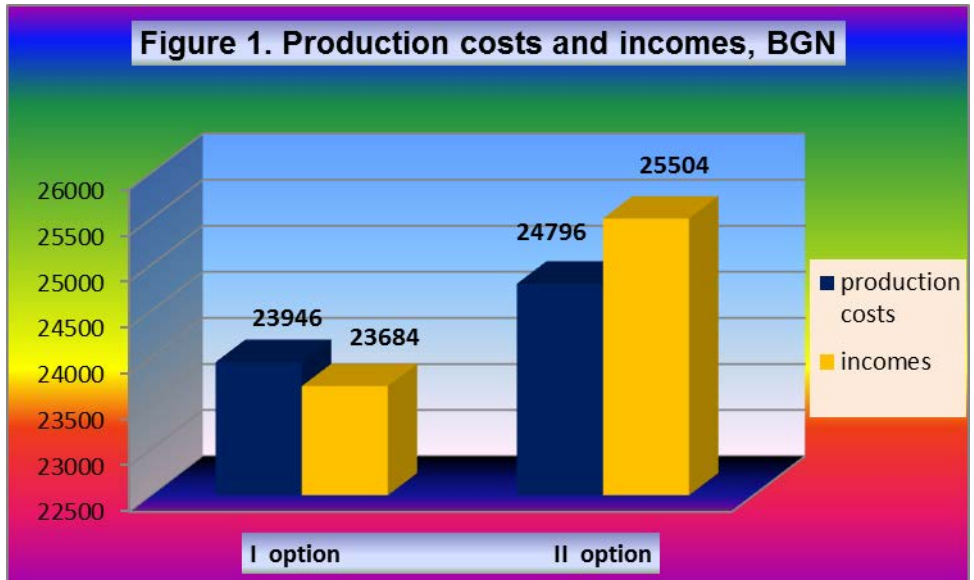


Figure 1. The production costs and the income from the farm.

On table 4 economic results are represented. The economic activities have been analyzed in both cases – with and without subsidies from the state, taking in account the subsidy is amounting to 41 BGN per ewe. In case the farmer is getting subsidy from the state the profit gained amounts to 3838 BGN /I option/ and 4808 BGN /II option/ as the profit per ewe is respectively 38.38 BGN and 48.08 BGN. In case the farmer does not receive subsidy from the State Fund “Agriculture” profit amounts to 708 BGN for the second option and for the first option there is a loss amounting to 262 BGN.

Table 4. Economic results

Indices	Value, BGN	
	I option	II option
Incomes, BGN	23684	25504
Costs, BGN	23946	24796
Subsidies, BGN	4100	4100
Profit with subsidies, BGN	3838	4808
Profit per sheep with subsidies, BGN	38,38	48,08
Rate of profitability with subsidies, %	16,03	19,39
Profit without subsidies, BGN	-262	708
Profit per sheep without subsidies, BGN	-2,62	7,08
Rate of profitability without subsidies, %	-1,09	2,86

The rate of profitability which is relative index of production efficiency and expresses the rate of return of production is the following – 16,03% /I option/ and 19,39%/II option/ in case the farmer is getting subsidy and 2,86% /II option/ and -1,09% /I option/ in case the farmer does not receive subsidy from the state.

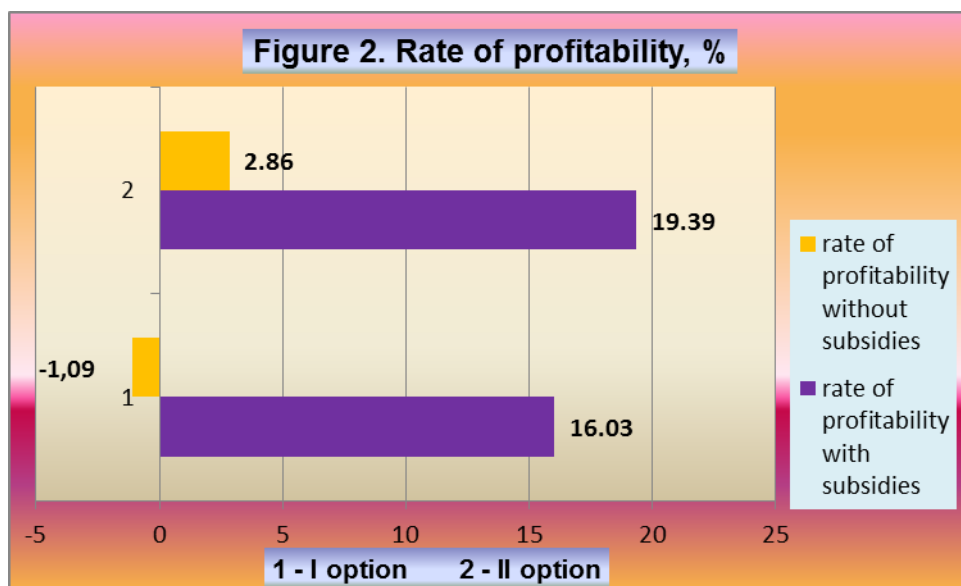


Figure 2. The rate of profitability with and without subsidies.

Profit in option II increases with 25.27% compared to option I in case the farmer is getting subsidy which means 970 BGN more. When analyzing the growth amounting to 970 BGN and the additional cost made for concentrate mixture in order to improve the milk productivity amounting to 850 BGN we ascertain the fact that for every 850 BGN additional cost that farmer makes to improve the feeding process and milk productivity he has return of 120 BGN additional profit but only if his activities are subsidized by the State Fund “Agriculture”.

Conclusion

It was found that:

In the terms of the present study we may draw the conclusion that in case the farmer is not getting subsidy from the State Fund “Agriculture” will be efficiently to raise only ewes that have milk productivity 100 l per lactation.

In support of the farm subsidies by the State Fund "Agriculture" and the two levels of milk production is appropriate breeding of dairy sheep in the mountainous and hilly regions of the country.

In order to improve the economic efficiency farmers should pay attention to increasing the fertility of ewes and protection of the new-born lambs as well as increasing of milk productivity of ewes.

Ekonomska efikasnost uzgoja muznih ovaca u planinsko-brdskom regionu Bugarske

Y. Popova, S.Slavova, S. Laleva, D. Yordanova, T. Angelova, P. Slavova, J. Krastanov

Rezime

Ovčarstvo je važan način da se obezbede sredstva za život za stanovništvo koje živi u planinskim i brdskim područjima zemlje. Cilj ove studije je da se analizira ekonomska efikasnost uzgoja muznih ovaca u planinskim i brdskim područjima Bugarske. Predmet istraživanja su 2 modela farme sa 100 ovaca i relevantne kategorije jagnjadi i ovnova. U radu se porede i analiziraju dva nivoa proizvodnje mleka - 70 l po laktaciji na prvoj farmi i 100 l po laktaciji na drugoj farmi. Žitarice i krmno bilje potrebno za ishranu ovaca se obračunava u kalkulaciji, a seno je obezbeđeno na samoj farmi. Prosečna plodnost po ovci je 115%, prosečan prinos vune je 2.2 kg i remont stada je 20%. Prihodi i troškovi se procenjuju u tekućim cenama za 2013 - 2014.

Utvrđeno je da, u slučaju da farmer ne dobija subvencije iz državnog fonda "Poljoprivreda", efikasnije je da se bavi odgojem samo ovaca koje imaju produktivnost mleka 100l po laktaciji; u znak podrške poljoprivrednim subvencijama od strane državnog fonda "Poljoprivreda," i dva nivoa proizvodnje mleka, prikladno je za uzgoj muznih grla u planinskim i brdskim područjima zemlje; u cilju poboljšanja ekonomske efikasnosti, farmeri treba da obrate pažnju na povećanje plodnosti ovaca i zaštitu novorođene jagnjadi, kao i povećanje proizvodnje mleka od ovaca.

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Received 1 April 2015; accepted for publication 10 July 2015