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# ANALYSIS OF INCOMING AND OUTGOING CASH FLOWS OF DAIRY SHEEP BREEDING FARMS IN BULGARIA

TSVETANA HARIZANOVA-METODIEVA<sup>1</sup>, NIKOLA METODIEV<sup>2</sup>

**Summary:** *The aim of the study is to explore cash flow categories (incoming, outgoing and net cash flow per ewe), generated by dairy sheep breeding farms in Bulgaria. The study was carried out with 3 conventional dairy sheep farms (511 ewes totally, all from the breed – Synthetic Population Bulgarian Milk), in which extensive farming system was applied. The information was collected through a questionnaire from farm owners in 2016. The study found that all three farms have positive net cash flow (735 EUR, 6415 EUR, and 32034 EUR). The cash flows of farms vary according to the specifics of their activity, but the largest share of the outgoing cash flows have that for labour payments (from 30.8% to 50.5%) and for the purchase of forages (from 10.8% to 47.3%). Fuel costs vary considerably (from 1.8% to 7.2%). From the incoming cash flows, substantial portion took the sales of sheep milk (from 32% to 54.8%) and lambs (from 23.6% to 38.4%), followed by subsidies (from 17% to 27.7%). The net cash flow per ewe greatly varied and took values of 7 EUR, 77 EUR, and 99 EUR, meaning that the profitable operation of each farm depends on local factors of the natural environment, business conditions and management decisions of the farm owners. It is necessary for the farmers to take precautions to keep lambs alive and healthy in order to maximize the financial effectiveness of the farm, as well as to sell milk at better price.*

**Keywords:** *dairy sheep farms, sales, cash flows, Bulgaria*

**JEL Classification:** *Q12*

## INTRODUCTION

Dairy sheep breeding is a sector that engages a relatively low skilled labor force, uses crude feed and waste raw materials from the food-processing industry, uses effectively depleted lands and pastures and provides basic or additional incomes to the rural population of Bulgaria. Dairy sheep breeding could be a profitable business even in harsh climate conditions [6]. Sheep can be reared on lands, inappropriate for other kinds of agribusiness [9]. Prevailing share of sheep milk is used for the production of cheese [3].

One of the factors having an impact over the profitability of dairy sheep farms is the average milk yield of the flocks, as well as the motivation of people to deal with dairy sheep. In this respect, a number of authors have studied the various categories of revenues, costs and efficiency of the sector in Bulgaria [7], [10], [12].

A study, established that in the Mediterranean countries, found that dairy sheep farming as a whole had generated higher income compared to meat direction of sheep breeding [5] and in Spain most of dairy Assaf farms were economically profitable [8].

The prospects of the sector in Bulgaria depend to a large extent on its subsidization, both by subsidies for ewes, including those under selection, as well as subsidies for arable land and pastures. Sheep farmers in Bulgaria can also receive financial support through the resources of the Programme "Rural development" 2014-2020, including for "Animal welfare", for young farmers and other measures.

Sheep-farmers may apply for financial aid *de minimis* for their ewes: for farmers, who have between 10 and 300 ewes – up to 15 BGN/ewe and for farmers, rearing more than 300 ewes – up to 7 BGN per ewe. Also farmers may receive subsidies for ewes, if they have 50 or more ewes under selection from one and the same breed or if they raise from 10 to 49 ewes in the mountain regions of the country. For organic farming, farmers may also apply for financial aid [13].

As an alternative to conventional farming, in recent years organic sheep breeding becomes more and more appealing to the farmers: 21072 heads of sheep for 2018 were under organic farming in comparison to 2015, when there were 18792 heads [1], [2]. According to a study [11] Bulgaria and Romania are countries with a great scope for growth in organic agriculture.

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Sheep takes the second largest share of organic livestock husbandry in Bulgaria after bees [4]. The aim of the study is to explore cash flow categories (incoming, outgoing and net cash flow per ewe), generated by dairy sheep breeding farms in Bulgaria.

## MATERIALS AND METHODS

The study was carried out with 3 conventional dairy sheep farms (511 ewes totally, all from the breed – Synthetic Population Bulgarian Milk), in which extensive farming system was applied. In the studied farms sheep were bred naturally once per year and the lambs were born in December and in January. The lambs were sold at live weight between 20 and 28 kg at the end of April to the middle of June. Pastures had an important role for these three sheep farms as a forage source. The average milk yield in the farms was from 80 to 90 liters per ewe for 120 days lactation period. Between 55% and 92% of ewes in the studied farms were from first to third lactation. Data about incoming and outgoing cash flows, incurred in the investigated dairy sheep farms were collected through a questionnaire from farm owners in 2016. Also information was gathered about the number of ewes, number of sold lambs per year and number of sold ewes and rams per year for each farm. The net cash flow per ewe was found. The three farms had realized revenues from the sale of sheep production (sheep milk, lambs, culled ewes and rams) and from subsidies (received for the pastures and for the animals). The outgoing cash flows include: labour payments, purchased fodders, fuels, medications and veterinary services, accounting, selection, disinfectants, electricity, water, repair of agricultural machinery, rent of pastures, and other. The percentage for each type of outgoing and incoming cash flows was calculated.

## RESULTS AND DISCUSSIONS

Table 1 shows the cash flows of the studied three dairy sheep breeding farms and the net cash flow per ewe.

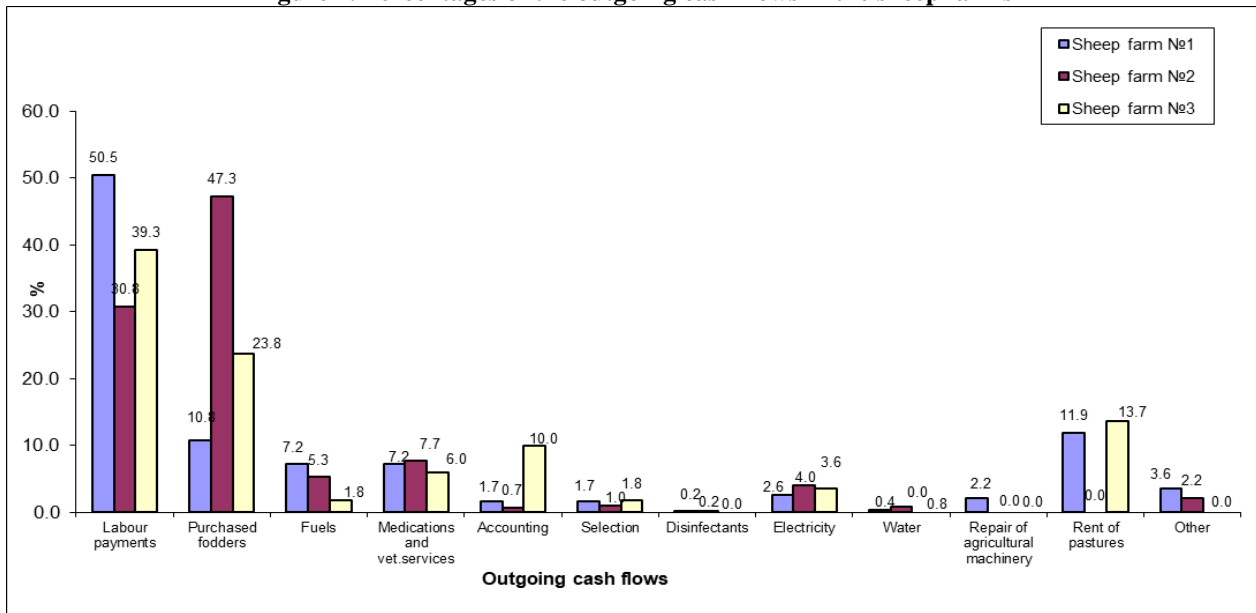
**Table 1. Cash flows of three dairy sheep breeding farms**

<b>№</b>	<b>Variables:</b>	<b>Sheep farm №1</b>	<b>Sheep farm №2</b>	<b>Sheep farm №3</b>
1	Number of ewes	83	325	103
2	Number of sold lambs per year	70	270	30
3	Number of sold ewes and rams per year	15	33	5
4	<b>OUTGOING CASH FLOWS (EUR):</b>	<b>6935</b>	<b>22716</b>	<b>8390</b>
5	Labour payments	3500	7000	3300
6	Purchased fodders	750	10750	2000
7	Fuels	500	1200	150
8	Medications and veterinary services	500	1750	500
9	Accounting	120	161	840
10	Selection	115	225	150
11	Disinfectants	15	50	0
12	Electricity	180	900	300
13	Water	30	180	0
14	Repair of agricultural machinery	150	0	0
15	Rent of pastures	825	0	1150
16	Other	250	500	0
17	<b>INCOMING CASH FLOWS (EUR):</b>	<b>13350</b>	<b>54750</b>	<b>9125</b>
18	Sales of sheep milk	4500	17500	5000
19	Sales of lambs	4200	21000	2150
20	Sales of ewes and rams	950	2025	425
21	Subsidies	3700	14225	1550
22	<b>NET CASH FLOWS (EUR) (17 - 4)</b>	<b>6415</b>	<b>32034</b>	<b>735</b>
23	<b>NET CASH FLOW PER EWE (EUR) (22/1)</b>	<b>77</b>	<b>99</b>	<b>7</b>

Source: data, collected through a questionnaire and own estimations.

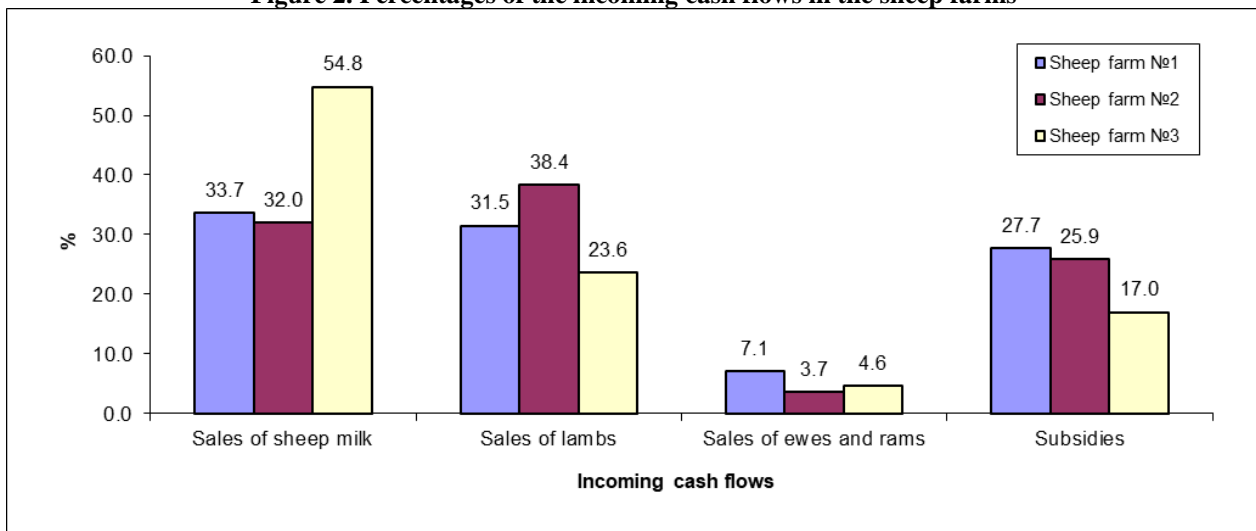
Figure 1 and Figure 2 show the percentage of each type of outgoing and incoming cash flows in the sheep farms.

**Figure 1. Percentages of the outgoing cash flows in the sheep farms**



Source: data, collected through a questionnaire and own estimations.

**Figure 2. Percentages of the incoming cash flows in the sheep farms**



Source: data, collected through a questionnaire and own estimations.

The number of ewes in the studied dairy farms is 83, 103 and 325. The number of sold lambs per year is from 30 to 270 and the number of sold ewes and rams per year is from 5 to 33.

The study found that all three farms have positive net cash flow (735 EUR, 6415 EUR, and 32034 EUR). The farms' cash flows vary according to the specifics of their activity, but the largest share of the outgoing cash flows have that for labour payments (from 30.8% to 50.5%) and for the purchase of forages (from 10.8% to 47.3%). The farmer with 103 ewes have bought forage for a sum of 2000 EUR per year and the rest of needed feed for animals is own production. The farm with 325 ewes have bought all the forage (excluding grass for grazing): 600 bales alfalfa (2 EUR per bale); hay – 1000 bales (1.5 EUR per bale); straw – 500 bales (0.5 EUR per bale); wheat – 20 tons (150 EUR per ton); corn – 20 tons (165 EUR per ton); forage mixtures – 4 tons (375 EUR per ton). The farm with 82 ewes have bought only corn – 5 tons (150 EUR per ton), the rest of feed is own production.

Our results were in accordance with a study [12], according to which the labour costs in a farm, rearing the same breed (Synthetic Population Bulgarian Milk) varied from 42.3% to 45.8% and the forage costs took values from 37% to 41%.

Fuel costs vary considerably (from 1.8% to 7.2%) in our study. Medications and veterinary services take similar percentages in the three farms: between 6% and 7.7%. Accounting services vary substantially between 0.7% and 10%. Selection expenses take between 1% and 1.8%. Rent of pastures is between 0% and 13.7%. Electricity is between 2.6% and 4%. Disinfectants and water take the smallest share of outgoing cash flows of the dairy farms.

From the incoming cash flows, substantial portion take the sales of sheep milk (from 32% to 54.8%) and lambs (from 23.6% to 38.4%), followed by subsidies (from 17% to 27.7%).

The selling price of lambs varied from 2.75 EUR to 3 EUR per 1 kg live weight. The selling price for 1 kg live weight of sold ewes and rams varied from 1 to 1.5 EUR. The selling price of sheep milk per 1 liter was between 0.6 EUR and 0.69 EUR, but for high quality sheep milk, used for cheese production, the price had reached 1 EUR per liter.

In the conducted study the net cash flow per ewe greatly varies and takes values of 7 EUR, 77 EUR, and 99 EUR, respectively for each farm. It was established in a research [7], that the gross margin per ewe can take value of 110 BGN, or approximately 56 EUR, for a flock of Synthetic Population Bulgarian Milk breed.

One of the reasons for relatively small value of the net cash flow per ewe in the third farm (with 103 ewes) was that the farmer had sold only 30 lambs. It was due to high mortality rates of lambs (20-30% mortality rate) and ewe lambs (10% mortality rate). For comparison in the other two farms the mortality rate for lambs took values from 5% to 9% and for ewe lambs – from 0% to 1%. The other reason for the low net cash flow per ewe in the third farm was the selling price of sheep milk – 0.6 EUR per liter. The other two farms had sold milk for 0.69 EUR per liter.

So, we can conclude that the profitable operation of each farm depends on local factors of the natural environment, business conditions and management decisions of the farm owners. It is necessary for the farmers to take precautions to keep lambs alive and healthy in order to maximize the financial effectiveness of the farm, as well as to sell milk at better price.

## CONCLUSIONS

The study found that all three farms have positive net cash flow (735 EUR, 6415 EUR, and 32034 EUR). The farms' cash flows vary according to the specifics of their activity, but the largest share of the outgoing cash flows have that for labour payments (from 30.8% to 50.5%) and for the purchase of forages (from 10.8% to 47.3%). Fuel costs vary considerably (from 1.8% to 7.2%). Medicaments and veterinary services take similar percentages in the three farms: between 6% and 7.7%. Disinfectants and water took the smallest share of outgoing cash flows of the dairy farms.

Substantial share of the incoming cash flows, takes the sales of sheep milk (from 32% to 54.8%), followed by the sale of lambs (from 23.6% to 38.4%) and subsidies (from 17% to 27.7%).

All the three dairy sheep breeding farms have realized positive net cash flow and positive net cash flow per ewe respectively. The net cash flow per ewe greatly varies and takes values of 7 EUR, 77 EUR, and 99 EUR, meaning that the profitable operation of each farm depends on local factors of the natural environment, business conditions and management decisions of the farm owners. It is necessary for the farmers to take precautions to keep lambs alive and healthy in order to maximize the financial effectiveness of the farm, as well as to sell milk at better price.

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