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CASH FLOWS FROM OPERATING ACTIVITIES AND EFFECTIVENESS OF DAIRY CATTLE FARMS IN BULGARIA

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Abstract

The aim of the research was to estimate cash flows from operating activities of dairy cattle farms in Bulgaria and to compare their effectiveness. In order to achieve the aim, in 2016, information was collected by questionnaires from 2 dairy farms located in Northern Bulgaria. The first farm had 16 cows in the main herd, and the second farm had 120 cows respectively. A number of indicators had been studied: farm size (number of animals, arable land and pasture in decares), animal feed, milk production, number of calves born and fattened, cleaning technologies used in the farms, animal health, cash flows by categories. An estimate of the cash flows from operating activities of the dairy cattle farms had been developed. The estimate was based on the collected information and on the basis of own calculations. The farm with 120 cows in the main herd achieved higher effectiveness than the farm with the smaller herd, although the farm with 16 cows managed 50 decares more arable land, achieved higher average milk yield (7,000 l vs. 6,000 l) and received subsidies. Workforce involved with cattle operations in the first farm was used less effectively compared with that in the second farm: a cattleman tended for an average of 8 cows in the main herd in the first farm and for 30 cows in the second farm.

Key words**:** *Bulgaria, dairy cattle sector, effectiveness, cash flows*

INTRODUCTION

Dairy cattle husbandry is an irreplaceable branch in Bulgarian economy, providing 88.7% of obtained milk in 2016 [6]. The number of dairy cattle farms fell down by 13.1% at 01.11.2016 compared to 01.11.2015, particularly those having up to 9 animals in main herds, which decreased with 14.39% [5], [6]. A tendency of growth in farms' number, that had 50 or more dairy animals was observed (with 8.13% more in 2016 than in 2015). The ratio of dairy cows kept on farms having up to 9 animals also showed reduction with 12.66%, while the share of cows kept on farms with 50 or more animals had raised by 9.83% [5], [6]. Some authors [2] explained the restructuring and trend of declining cattle's number in Bulgarian farming with incremented quality control and reglaments in the livestock sector.

According to some authors [1], European dairy production is influenced by regional conditions. Milk yield per cow for EU was 6,932 kg in 2016, while that value was with 47% smaller for Bulgaria (3,653 kg) [3].

The aim of the research was to estimate cash flows from operating activities of dairy cattle farms in Bulgaria and to compare their effectiveness.

MATERIALS AND METHODS

In order to achieve the aim, in 2016, information was collected by questionnaires from 2 dairy farms located in Northern Bulgaria. The first farm had 16 cows in the main herd, and the second farm had 120 cows respectively. A number of indicators had been studied: farm size (number of animals, arable land and pasture in decares), animal feed, milk production, number of calves born and fattened, cleaning technologies used in the farms, animal health, cash flows by categories. An estimate of the cash flows from operating activities of the dairy cattle farms had been developed. The estimate was based on the collected information and on the basis of own calculations. Value Added Tax was not included in cash flows. Farms were selected because of similarities in the environmental conditions in which they

operated and because of the similar size of their arable land (the first farm managed 450 decares arable land and the second - 400 decares). The size of the pastures they managed was compliant with the needs of animals for grazing.

In the first farm, there were 16 dairy cows in the main herd, of which animals in second and third lactation were prevailing. The arable land was 450 decares and pastures - 160 decares. Cows were used 5 lactations on average; the farmer retained heifers as replacement, including them in the herd at the age of 23-24 months; calves were fattened on average of 14 months; artificial insemination of cows was practiced, natural insemination was practiced by exception; average milk yield was 7,000 l; service period was 70 days on average and the dry period was 60 days; the animals were in good health - clinical mastitis and fertility problems were observed in no more than 1 cow per year; in the summer animals grazed on the pastures, situated in more than 1 km away from the farm; cows were milked with vacuum pump; barns were cleaned manually; tie-stall housing system was used; cow beds were kept clean and comfortable with plenty of straw; the farm employed 4 workers: 2 were engaged in crop and forage production and 2 in cattle farming activities (cattleman staff). Alfalfa, wheat, barley and corn were grown on the arable land. The farm produced the predominant part of the animal feed (barley - 25 tons, corn - 20 tons and 12 tons of hay), and sold part of its crop production (wheat - 32 tons and corn - 26 tons). The farm also received subsidies. The owner of the farm had veterinary education and carried out the veterinary activities in the farm by himself.

In the second farm, 120 cows were kept. The arable land was 400 decares, pastures - 800 decares. The land was used entirely for the production of forages to feed the animals and there were no sale of excess forage. Cows were used 5 lactations on average and about 16% of cows were culled annually; the farmer retained heifers as replacement and included them in the main herd at the age of 23-26 months; artificial insemination of cows was practiced; average milk yield was 6,000 liters; calves were fattened on average of 12 months; service period was 90 days on average and the dry period was 55 days; mortality of calves up to 6 months of age was about 2% per year, and over 6 months of age - about 1%, clinical mastitis were observed in 0.5% of cows, subclinical mastitis - 1%, hoof problems - 2%, endometritis - 2%, fertility problems - 2%; during the summer period the animals grazed on pastures, situated up to 1 km away from the farm; cows were milked with a milk pipeline; tie-stall housing system was used; cow beds were covered with a thin layer of straw; mobile cleaning system was used; the farm employed 8 workers: 4 were engaged in crop and forage production and 4 in cattle farming activities. Cash inflows of the farm were from the sale of cattle production. According to the gathered information from the questionnairy, the farmer didn't receive subsidies. The farm produced the biggest part of the needed forages for the animals: lucerne hay, corn grain and about 40 tons of hay from the pastures.

RESULTS AND DISCUSSIONS

The two dairy farms' studied indicators (cash flows and effectiveness) were presented in Table 1.

Both farms bought a part of feeds needed for foraging the animals and produced the rest of it. According to some authors [4], forage cost has statistically significant effect on efficiency in dairy farms.

While in both farms the biggest share of inflows took those from milk sales, the first farm also realized incomings from calve and forage sales and from subsidies; the second – from calve, heifer and cow sales.

Cash flow structures of both farms were represented in Figures 1, 2, 3 and 4.

Figure 1 showed that 62.93% of the inflows of the first farm came from cattle production sales (cow milk – 50.53% and calves – 12.40%), wheat and corn sales occupied 19.03% and subsidies took 18.04%.

Table 1. Cash flows and effectiveness indicators

№	Indicators:	First farm (16 cows in the main herd)	Second farm (120 cows in the main herd)
1	**Cash inflows (BGN) (2+5+9+13+18)**	**88,680.00**	**351,375.00**
2	**From the sale of cow milk (BGN) (3*4)**	**44,800.00**	**288,000.00**
3	milk (l)	112,000,00	720,000.00
4	sale price per 1 l cow milk (BGN)	0.40	0.40
5	**From the sale of calves (BGN) (6*7*8)**	**11,000.00**	**52,650.00**
6	number of calves sold	10.00	45.00
7	live weight of calves sold - kg	440.00	450.00
8	sale price per 1 kg live weight of calves (BGN)	2.50	2.60
9	**From the sale of cows and heifers (BGN) (10*11*12)**	**0.00**	**10,725.00**
10	number of cows and heifers sold	0.00	13.00
11	live weight of cows and heifers sold - kg		550.00
12	sale price of 1 kg live weight of cows and heifers (BGN)		1.50
13	**From the sale of crop and forage production (BGN) (14*15*1000+16*17*1000)**	**16,880.00**	**0.00**
14	wheat (tons)	32.00	
15	sale price per 1 kg of wheat (BGN)	0.30	
16	corn (tons)	26.00	
17	sale price per 1 kg of corn (BGN)	0.28	
18	**From subsidies (BGN)**	**16,000.00**	**0.00**
19	**Cash outflows (20+21+22+23+29+30+31+32+33+34+35+36)**	**86,390.00**	**305,100.00**
20	**Medicaments (BGN)**	**500.00**	**800.00**
21	**Purchased forages (BGN)**	**4,000.00**	**40,000.00**
22	**Labour costs - salaries and social securities (BGN)**	**33,000.00**	**65,000.00**
23	**Services (BGN), including: (24+25+26+27+28):**	**3,200.00**	**11,500.00**
24	- insemination	600.00	1,500.00
25	- accounting	2,400.00	3,600.00
26	- veterinary		3,600.00
27	- for selection	200.00	2,300.00
28	- consulting		500.00
29	**Electricity (BGN)**	**300.00**	**4,000.00**
30	**Water (BGN)**	**360.00**	**18,000.00**
31	**Disinfectants (BGN)**	**100.00**	**800.00**
32	**Rent /arable land/ (BGN)**	**20,000.00**	**40,000.00**
33	**Rent /pastures/ (BGN)**	**930.00**	**2,000.00**
34	**Spare parts for agricultural machinery (BGN)**	**1,000.00**	**4,000.00**
35	**Fertilizers, seeds, plant protection products and fuels (BGN)**	**21,000.00**	**42,000.00**
36	**Other payments (BGN)**	**2,000.00**	**77,000.00**
37	**Net cash flow (BGN) (1-19)**	**2,290.00**	**46,275.00**
38	**Effectiveness indicators**		
39	**Rate of return on cash inflows (%) ((37/1)*100)**	**2.58**	**13.17**
40	**Rate of return on cash outflows (%) ((37/19)*100)**	**2.65**	**15.17**
41	**Number of cows per 1 cattleman**	**8**	**30**

Source: data, collected from dairy farms and own calculations.

In the second farm (Figure 2) selling of cow milk took 81.97%, which was similar to the established 88.28% of some authors [7]; calve sales occupied 14.98% and those from heifers and cows – 3.05%.

Figure 3 showed that labour costs (salaries and social securities) occupied the largest share of the sum of outflows of the first farm (38.20%), followed by the purchase of fertilizers, seeds, plant protection products and fuels (24.31%) and for rent of arable land (23.15%). The lowest were the shares of disinfectants, electricity, water, medicaments,

rent of pastures and spare parts for agricultural machinery.

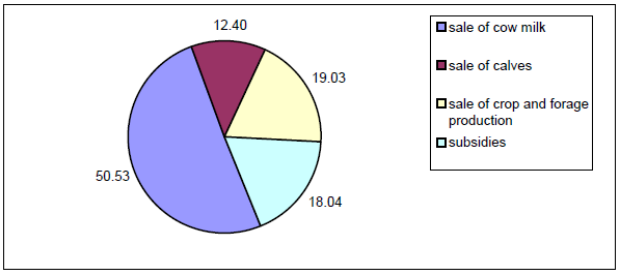

Fig. 1. Cash inflows of a farm with 16 cows in the main herd (%)
Source: data, collected from a dairy farm and own calculations

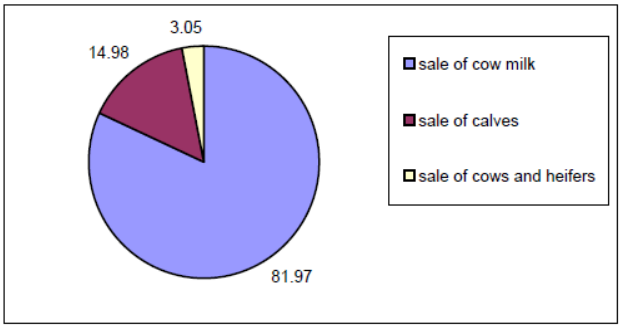

Fig. 2. Cash inflows of a farm with 120 cows in the main herd (%)
Source: data, collected from a dairy farm and own calculations

According to Figure 4 other payments occupied the largest relative share (25.24%) of the outflows' sum in the farm with 120 cows in the main herd, followed by labour associated payments (21.30%).

The purchase of fertilizers, plant protection products, seeds and fuels occupied 13.77%, followed by the purchase of forages (13.11%) and rent of arable land (13.11%). The shares of disinfectants, medicaments, pasture rent, electricity and spare parts for agricultural machinery were the lowest.

The first farm had realized net cash flow of 2,290 BGN, which was small, but positive and if subsidies were not taken into the account, the farm's activity would have been unprofitable.

The second studied farm had realized 46,275 BGN net result, although it received no subsidy and managed less arable land than the first farm.

According to calculations the farm with 16 cows in the main herd realized 2.58% return on cash inflows and 2.65% return on cash outflows. These values for the second farm were 13.17% and 15.17% respectively. The second farm more efficiently used labour engaged in cattle operations, which could be seen from the indicator "Number of cows per 1 cattleman": one cattleman tended for 8 cows in the main herd in the first farm and for 30 cows in the second farm.

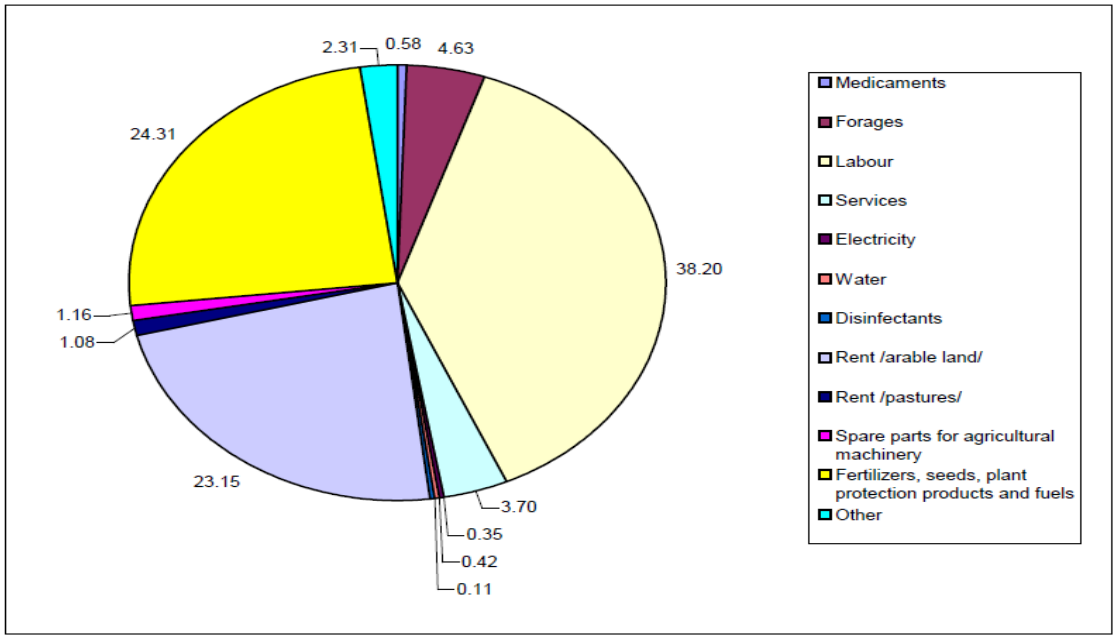

Fig. 3. Cash outflows of a farm with 16 cows in the main herd (%)
Source: data, collected from a dairy farm and own calculations

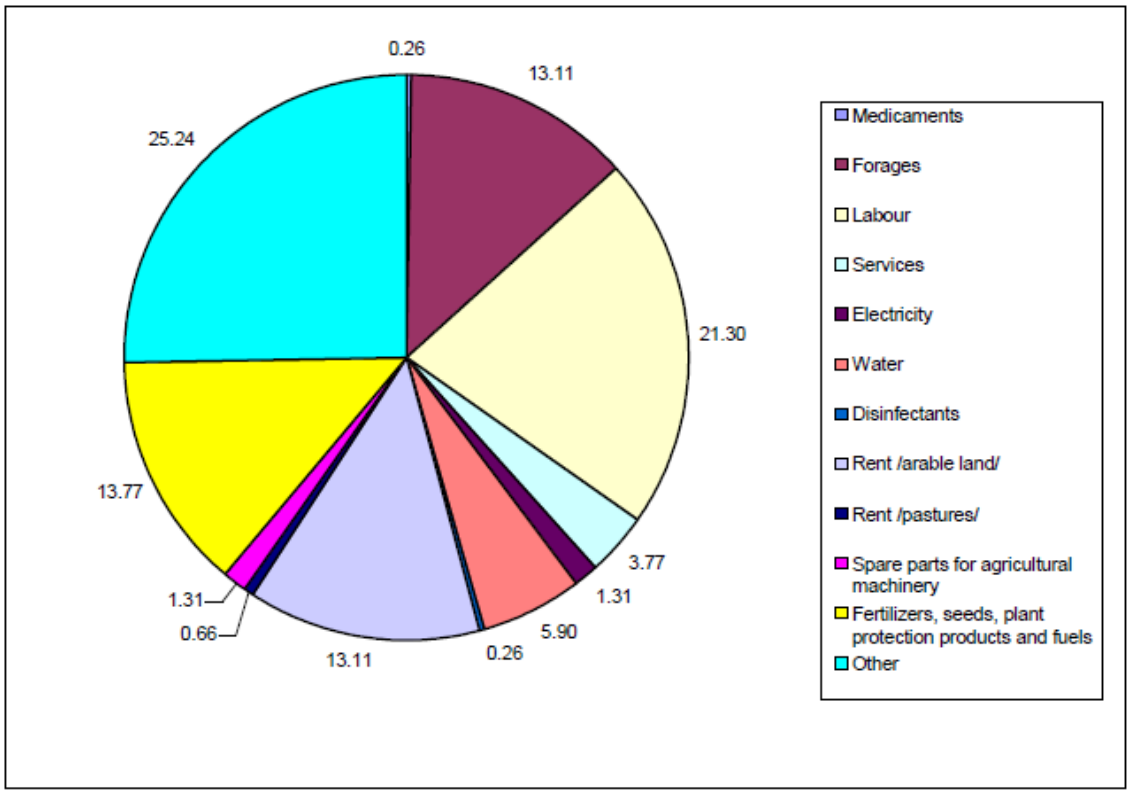

Fig. 4. Cash outflows of a farm with 120 cows in the main herd (%)
Source: data, collected from a dairy farm and own calculations

CONCLUSIONS

The farm with 120 cows in the main herd achieved higher effectiveness than the farm with the smaller herd, although the farm with 16 cows managed 50 decares more arable land, achieved higher average milk yield (7,000 l vs. 6,000 l) and received subsidies.
Workforce involved with cattle operations in the first farm was used less effectively compared with that in the second farm: a cattleman tended for an average of 8 cows in the main herd in the first farm and for 30 cows in the second farm.

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