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Properties of dairy production in the Sarajevo-Romanija region

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Abstract: Sarajevo - Romanija region entirely belongs to the hilly and mountainous region where livestock production is the dominant form of agriculture. The paper presents results of a research conducted on a sample of ten farms engaged in dairy production. The use of scientific methods has helped us gain a clearer picture of basic organizational and economic characteristics of dairy production in the Sarajevo - Romanija region.

Farm production conditions are characterized by marked heterogeneity, resulting in variability of economic performance. In cases where there was a higher degree of fulfilment of prescribed organizational and technological measures, satisfactory economic performance was achieved and the farms, with additional improvements implemented, have further prospects in milk and calf production.

Key words: dairy production, Sarajevo - Romanija region, production conditions, economic performance

Introduction

Although improvements were observed in the past, it is obvious that milk production in Republic of Srpska still lags behind developed countries, and that it is not competitive in the increasingly open market (Vico, 2009).

The unfavourable characteristics of dairy production in the Republic of Srpska, primarily reflected through low milk yields per cow, disadvantaged racial composition, low marketability of production, insufficient use of modern organizational and technological solutions, indicate the necessity of taking a series of activities aimed at improving the overall production.

The need for comprehensive consideration of the situation and the improvement of dairy production in these regions becomes even more apparent if one takes into account the fact that the hilly and mountainous region, due to its natural conditions, is the limiting factor for certain types of agricultural production, being therefore focused on animal husbandry.

Agroeconomic problems of dairy production in the hilly and mountainous areas of the Republic of Srpska in the last two decades have not been adequately investigated. Exceptions include sporadic research, such as Krstic et al. (2006), Vico (2009), Vico et al. (2010).

Krstic et al. (2006) studied the competitiveness of dairy production in lowland and upland areas of the Republic of Srpska. Using the method of equilibrium relative prices for the Unification of profitability, profit per cow and profit per hour of work, the authors found that the observed groups of farms were in the same position in terms of competitiveness. Vico et al. (2010) investigated the production capacity of farms focused on dairy production located in the Sarajevo - Romanija region. They found that the registered volume of production is significantly below the level that allows available capacity.

The Sarajevo - Romanija region entirely belongs to the hilly and mountainous area, where animal husbandry is the predominant form of agricultural production. Proximity and good connectivity quality of transport infrastructure with a large processing facilities in Sarajevo is a market basis for the successful production of milk.

The aim of this paper is to illustrate and explain the data on economic characteristics of family farms focused on dairy production, located in the Sarajevo – Romanija region.

Material and methods

The research covered the Sarajevo - Romanija region. This region includes seven municipalities (Sokolac, Pale, Rogatica, E. O. T., E.N. Sarajevo, Center, E. Ilidža).

Collection of data on farm characteristics was carried out on a selected sample of 10 farms. With the help of purchase organizers and extension services experts, the structure of the sample was defined. The condition that had to be fulfilled was a continuous supply of milk throughout the year.

The questionnaire is designed to provide the necessary information about demographic, structural, organizational and economic indicators. The data

collected relate to the conditions and results of operations in 2008. In addition to the questionnaire, additional sources of data included records obtained from state administration institutions and literature sources. The average dairy production per milking head is obtained based on the total quantity of milk produced and the average annual number of milking animals is obtained by using a form of individual trades flock (Krstic et al. 2000).

The methodology used for the preparation of calculations was according to Andric (1998). Cost calculation for internal implementation products (fodder produced on the farm) was based on data collected through surveys.

Revenue from dairy enterprise:

$$R_{de} = I_{de} - C_{wlf}$$

Farming productivity:

$$FP = \frac{R_{de}}{M_{pe}}$$

Revenue per dairy cow:

$$R_{pdc} = \frac{R_{de}}{DC_{num}}$$

Farming eficiency:

$$FE = \frac{I_{de}}{C_{wlf}}$$

Farming rentability:

$$FR = \frac{R_{de}}{I_{de}}$$

were:

R_{de} – revenue from dairy enterprise; I_{de} – income from dairy enterprise; C_{wlf} – total costs in dairy enterprise without costs of labour force; DC_{num} – number of dairy cows; *FE* - farming eficiency; *FP* - farming productivity; family member with permanent employment on farm; *FR* - farming rentability; R_{pdc} - Revenue per dairy cow.

Results and discussion

Basic information about Sarajevo - Romanija region

The Sarajevo - Romanija region is located in central B&H and eastern part of Republic of Srpska. In terms of geographical regionalization, this area belongs to the mountain - Basin region, and subregions of Eastern and Central Bosnia.

Table 1. Selected indicators of Sarajevo - Romanija region

| Indicators	Unit		Value
Total area	km^2		2,066.50
Agricultural land	ha		79,887.00
Number of inhabitants	number		78,170
Density	inhabit/km^2		37.83
Number of households	number		23,719
Cattle (total)	Number animal	of	12,256
Cows and heifers	Number animal	of	8,043

Source: The Report of the East Sarajevo
Republic Institute for Statistics

The research area accounts for 11.85% of the total area of the Republic of Srpska, its population making up 5.28% of the total population. Agricultural land accounts for 38.66% of the total area. Of the total 79,887 ha of agricultural land (Table 1), meadows cover the largest area (50.45%), followed by pastures (32.75%) and fields, accounting for only 13.74% due to morphometric and climatic characteristics of the region.

In terms of available agricultural land, the total number of cattle of 12,256 (Table 1) is extremely low, suggesting that there are basic prerequisites for the increase in production volume.

Production indicators of farms

To illustrate production indicators, data on the average disposable livestock, as well as data on production and realization of milk are presented below.
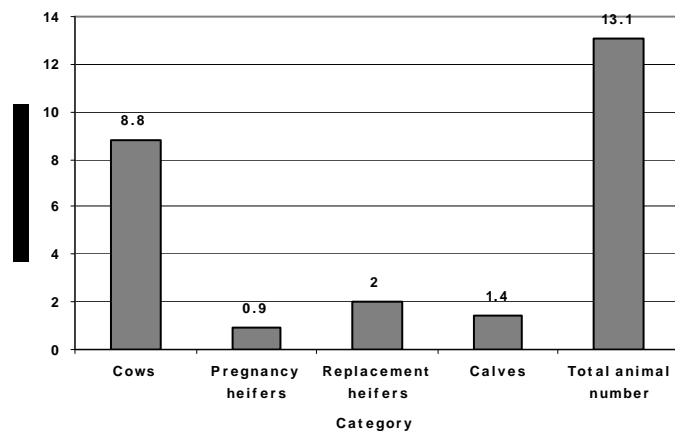
Graf 1. Herd structure

Available livestock along with the number of dairy cows is a decisive factor in dealing with dairy production. The successful organization of production implies the need to establish a certain proportion in the number of different herd categories. An average farm had 8.8 cows (Figure 1) and their share in the total number of individuals was 68.32%.

Production of milk and realization

The annual dairy production of dairy cows in Bosnia and Herzegovina significantly lags behind the European average. Regardless of constant growth, it is still unsatisfactory and amounts to about 2,500 kg (Bajramovic et al. 2009), (Vico et al. 2011). Data on production and realization of milk on the farms studied are shown in Table 2.

Table 2. Selected indicators of milk production and sales

Indicators	Unit	Average	Min	Max	CV
Total annual production of milk on the farm	lit	29.627,20	13.565	65.384	48.16
Average annual milk yield per dairy cow	lit	3.698	2.994	4.877	17.12
Marketability of production	%	74.74	58.20	96.90	14.17

The high variation in the total annual production of milk is the result of differences in livestock for the test farms. The average number of dairy cows during the year on the farms ranged from 4 to 19.

The average annual milk yield of 3.698 (Table 2) is higher than the state average, but significantly lower than the European average, and genetic features of dairy cows. The average marketability in milk production in Bosnia and Herzegovina is around 30%, which is an extremely unfavorable indicator. The average level of marketability of the sample was 74.74% and its variation is a consequence of different zoo-technical and organizational solutions represented for individual farms.

Economics in Business Results

Economic conditions necessitate that family farms perform continuous economic determination of business performance, so that on the basis of precise information, managers can make the best possible business decisions. During field research, a low level of knowledge of economics of production by the manufacturer is observed.

Also, running any kind of business records is extremely unsatisfactory. Based on questionnaires, calculations were made for all categories of livestock on an annual basis in terms of on-farm milk and calf production, as shown in Table 3.

Table 3. Calculation of milk and calf production

Part	Measure unit	Amount	Price	Amount (BAM)	Amount (EUR)	Share (%)
A) Production value				3174,46	1623,10	100,00
Milk	lit	2.562	0,63	1.614,06	825,27	50,85
Subsidies	lit	2.562	0,20	512,40	261,99	16,14
Calf	kg	133	6	798	408,02	25,14
Cow growth	kg	30	3	90	46,02	2,84
Manure	t	8	20	160	81,81	5,04
B) Cost (B1 + B2)				2.938,65	1.502,53	100,00
B1) variable costs				2.562,25	1310,08	87,19
1. Feed				1.753	896,31	
- hay	kg	2.190	0,15	328,50	167,96	
-Silage	kg	5.250	0,07	367,50	187,90	
- Concentrate	kg	720	0,70	504	257,70	59,65
- Wheat flour	kg	800	0,35	280	143,16	
- Green weight	kg	3.600	0,04	144	76,63	
- Wheat chaff	kg	270	0,30	81	41,42	
- Graizing	kg	2.400	0,02	48	24,54	
2. Milk for calves	kg	775	0,83	643,25	328,89	21,89
3. Concentrate for calves	kg	44	0,60	26,40	13,50	0,90
4. Insemination		1	40	40	20,45	1,36
5. Veterinary services and medicines				50	25,56	1,70
6. Other variable costs				50	25,56	1,70
B2) Fixed costs				376	192,25	12,79
7. Amortization				376	192,25	
- Basic herd				236	120,67	12,79
- Construction				120	61,36	
- Equipment				20	10,23	
Income (A – B)				**235,81**	**120,57**	

Based on the above calculations (Table 3), a range of necessary important information can be obtained for manufacturers in making business decisions.

The largest portion of revenue comes from selling milk and earned premiums (66.99%). Woodlands are an example of the spent 775 liters of milk for the calf education. When such data are available, additional calculations can be determined by competition between different products (in this case between milk and veal), and thus affect the proper choice of farming technology.

Cost of feed for dairy animals are most complex costs, amounting to less than 60%, while ranging in the sample from 46-72%. A correlation analysis revealed that additional purchase of animal feeds on the market positively affects the share of costs of animal feed in total costs.

The calculated values of economic performance indicators are shown in Table 4.

Table 4. Indicators of economic performance

Indicators	Mean	Min	Max	CV (%)
Revenue from dairy enterprise	2034,30	-632,82	6062,72	90,87
Farming eficiency	1,21	0,91	1,68	19,66
Farming productivity	1278,01	-316,57	4257,01	103,88
Revenue per dairy cow	287,03	-145,22	972,09	117,61
Farming rentability	15,36	-11,15	43,10	102,02

Dairy production is a very complex economic activity offering a wide range of technological and organizational solutions. This forces manufacturers to make a proper choice between more variants. Manufacturers are more or less successful in decision making. This causes varying degrees of success in business. These studies have shown that dairy production in our region still shows marked variation (Table 4) in various indicators of economic performance of dairy production.

Conclusions

The Sarajevo - Romanija region has adequate natural resources to successfully deal with livestock as well as with commercial dairy production. Available resources, especially agricultural land, are not sufficiently used. This is particularly noticeable when observing the size of the livestock.

The economic performance reported by various indicators varies greatly, with positive economic results achieved in most cases. In cases where there was a higher degree of fulfillment of prescribed organizational and technological measures, satisfactory economic results were achieved, and the farm, with additional improvements implemented, will have further prospects in the milk and calf production.

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EKONOMSKA OBILjEŽJA PROIZVODNjE MLIJEKA U SARAJEVSKO - ROMANIJSKOJ REGIJI

- originalni naučni rad -

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Rezime

Sarajevsko - romanijska regija u potpunosti pripada brdsko - planinskom području, gdje je stočarstvo preovlađujući oblik poljoprivredne proizvodnje. U radu su predstavljeni rezultati istraživanja sprovedenih na uzorku od deset porodičnih gazdinstava koja se bave proizvodnjom mlijeka.

Uslovi proizvodnje na gazdinstvima karakterišu se izraženom heterogenošću, što prouzrokuje varijabilitet ekonomskog uspjeha poslovanja. U slučajevima gdje je zabilježen viši stepen ispunjenja propisanih organizaciono – tehnološkim mjera ostvareni su zadovoljavajući ekonomski rezultati i ta gazdinstva, uz dodatna poboljšanja, imaju dalju perspektivu u proizvodnji mlijeka i teladi.

Ključne riječi: proizvodnja mlijeka, Sarajevsko – romanijska regija, ekonomski rezultati poslovanja