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PROFITABILITY AND ECONOMIC PROFITABILITY OF MILK PRODUCTION FROM THE SIMMENTAL CATTLE BREED IN THE BITOLA PART OF PELAGONIA

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ABSTRACT

The quantitative property for milk production is under the control of multiple genes and the external environment. By using selective and genetic methods, the Simental milk breed has been created, which is also known by the name Swiss Fleckvieh.

The aim of the research is to determine, through an economic analysis, the profitability and rentability of the quantitative property of milk production, among cows of the Simmental breed in the Bitola part of Pelagonia. In the economic analysis, a calculation method was used in order to calculate the value of production-revenues, variable costs and gross margin.

Based on the results obtained from the production profitability indicators for the production year 2021, it can be concluded that the total value of production amounts to 9,330,900.00 denars or 151,230.14 euros, while the total variable costs amount to 7,770,000.00 denars or 125,931.92 euros and the margin of coverage or profit is 1,560,900.00 denars or 25,298.22 euros.

In the production year 2022, it is concluded that the total value of production amounts to 12,319,784.00 denars or 199,349.25 euros, the total variable costs amount to 11,528,980.00 denars or 186,553.07 euros, while the profit amounts to 790,804.00 denars or 12,796.18 euros. From the analysis of the two years, it can be concluded that the profitability of the farm is higher in the production year 2021 for 770,096.00 denars or 6,251.02 euros. The results of reduced profitability in 2022 are increased variable costs.

Subsidization by the state also has an impact on the profitability of the farm to a large extent.

Keywords: quantitative trait, cattle breed, milk price, gross margin.

INTRODUCTION

The Simmental belongs to the older breeds of cattle and is considered one of the most widespread breeds of cattle in the world. It is known under different names in the countries where it is bred. Quantitative properties, including milk production, are inherited and controlled under the action of several genes (G), and their expression is influenced by the environment (E), ($P = G + E$), (Phillips P.C., 1998).

The origin of the Simmental breed is from Switzerland with a dual purpose for milk and meat production. It was named after Simmental, the valley of the river Sime, in the Bernese Oberland, in the canton of Bern, where their cultivation was first recorded. Furthermore, the selection process created the following types of this breed: Simmental Fleckvieh, dual purpose (for meat and milk production) which is also known under the code 60, Swiss Fleckvieh was used for the Simmental breed aimed at milk production and Fleckvieh - Simmental, which is intended for fattening for meat production and is known under the code 66. The milk yield of the milk-producing strain ranges from 6500–7000 l of milk with over 4% milk fat, and herds with a higher average of 8000 l are very common (Massmann, P. C., 2014).

The profitability and economic rentability of the quantitative trait for milk production has a key role in the sustainability of farm production of cow milk in the Simmental breed.

Market conditions also greatly affect milk production on family farms. Economic profitability is reflected in the production of larger quantities of milk with a satisfactory quality standard and that the production costs are economically justified. At the same time, crop production on farms is adapted to economic goals and is a function of livestock production, thus providing quality feed for animals, as one of the main prerequisites for profitable milk production (Veljković, B., et al., 2013a).

In the economic analysis, a method of calculations was used and the incomes were calculated, that is, how many financial resources were left for the agricultural economy over the production costs. Gross margin is the ratio between sales price and production volume, on the one hand, and variable costs, on the other. These three factors have a key impact on gross margin. Based on the value of the coverage margin, the current and future economic position of the farm, as well as the economy and profitability, are evaluated (Grgić, Z. and Franić, R., 2002; Haluška, J. and Rimac, D., 2005).

Individual family farms have signed contracts with dairy farmers and thus have a guaranteed purchase of milk, a market and a constant source of income throughout the year. When managing the family farm, it is good to record production data, which can contribute to a more efficient use of the resources available to them. By recording the value of production - income and variable costs, farmers find their economic interest and improve production or fail. With calculation in milk production, the margin of coverage can be determined realistically, i.e. to what extent the realized income can to cover the incurred costs. Milk production on farms is accompanied by many problems, such as low purchase prices for milk and fat categories of livestock, constant increase in input prices, smaller production facilities with outdated facilities and equipment, etc. (Veljković, B., et al, 2017).

In order to achieve competitiveness and production efficiency, farmers strive to reduce costs and increase milk quality by applying appropriate hygienic conditions (Veljković, B., et al,

2013b). On the other hand, in order to increase milk production, and thus the economic profitability, the Ministry of Agriculture, Forestry and Water Management through the Program for Financial Support in Agriculture, and in accordance with the National Five-Year Program for Financial Support in Agriculture from 2019 planned payment of subsidies should be in accordance with the class of raw milk (proteins, fats, microorganisms, somatic cells, determining the freezing point and determining the occurrence of residues (Petrovska, B., et al. 2019)

MATERIALS AND METHODS

In the research, an economic analysis was used of the total value of production-revenues and total variable costs, which means how much financial assets the individual family farm is in profit, i.e. how much is the gross margin, after deducting the total variable costs from the total value of production - income. These three elements that participate in the economic analysis of the individual family economy, affect the amount of the obtained gross margin or profit.

The research was conducted on the individual family farm Chokuz village Trn, municipality of Bitola for the production of milk in Simmental cows in the 2021 and 2022 production years. The farm has a total of 88 head in 2021 and 90 head in 2022. In cooperation with the owner of the individual family farm, by filling in a survey questionnaire, the necessary data were obtained, which contained the elements value of production (income) and variable costs of milk production. In the economic analysis, a method of calculations was used and they were calculated (revenues, variable costs and the obtained profit on an annual level and are shown in tables and charts.

RESULTS AND DISCUSSION

Table 1. Value of the quantitative property milk production from the Simmental cattle breed in the production year 2021

Description The value of production	Quantity	Measure unit	Total denar	Total Euro
1.Milk	40 cows (313174l) 25.67l- 7829.35l	l	6 733 241.00	109 128.70
2. Spent milk for calf feeding	60 days x 8=480l x 15t=(7200.l)	l	154 800.00	2 508.90
3. Calves sale	25	head	462 750.00	7 500.00

4. Sale of barren cows	8 (5600kg)	kg		560 000.00	9076.17
5. Sale of bulls	-	kg		-	-
6. Ars manure	200 000	kg		60 000.00	972.44
7. State financial support (milk premium)	313 174	l		1 096109.00	17765 .13
8. Financial support for breeding high quality cattle	88	head		264 000.00	4 278.76
				9 330 900.00	151 230.14

From the economic analysis of the value of production (VP) in the production year 2021, it can be stated that it amounts to 9,330,900.00 denars or 151,230.14 euros. Of all the items, the profit from the sale of milk has the highest value and it amounts to 6,733,241.00 denars or 109,128.70 and the financial support is 1,096,900.00 denars or 17,765.13 euros.

Table 2. Variable costs of the quantitative property of milk production from the Simmental cattle breed in the production year 2021

Description of Costs	Quantity	Measure unit		Total denar	Total Euro
1. Alfalfa hay	88(454 240)–20kg/12kg	kg		2 952 560.00	47 853.48
2. Corn silage	63 (487500) – 25 kg/20kg	kg		975 000.00	15 802.26
3. Concentrate	63(131180) – 8kg/4 kg	kg		2 361240.00	38 269.69
4. Costs for veterinary services and medicine		-		160 000.00	2 593.19

5. Costs for artificial insemination	40	1 dose		48 000.00	777.95
6. Electricity costs	12	1m		67 200.00	1089.13
7. Phone costs	12	1m		48 000.00	777.95
8. Fuel costs	5 000	1		330 000.00	5 348.46
9. Expenses for other contractual services					
8- Workers	3x 12 /36	1m		720 000.00	11 669.36
- Maintenance	12	1m		108 000.00	1 750.40
Total:				7 770 000.00	125 931.92

*water is used from its own source - a well with a hydrophore

From the economic analysis of the variable costs (VC) in the production year 2021, it can be concluded that it amounts to 7,770,000.00 denars or 125,931.92 euros. Of all the items, the highest value of variable costs is alfalfa hay which amounts to 2,952,560.00 denars or 47,853.48 euros, concentrate which amounts to 2,361,240.00 denars or 38,269.69 euros and corn silage which amounts to 975,000.00 denars or 15,802.26 euros.

Table 3. Profitability of the quantitative property of milk from the Simmental cattle breed in the Bitola part of Pelagonia production in the production year 2021

Description	Total denars	Total Euro
Value of production (VP)	9 330 900.00	151 230.14
Variable Costs (VC)	7 770 000.00	125 931.92
Coverage margin (CM)	1 560 900.00	25 298.22

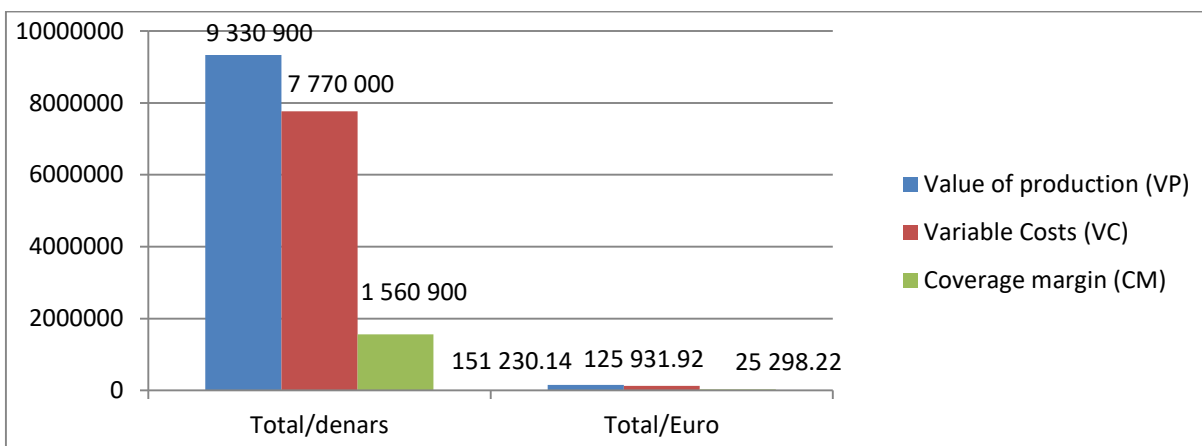


Chart 1. Profitability of the quantitative property of milk from the Simmental cattle breed in the Bitola part of Pelagonia production in the production year 2021

Table 3 and chart 1 present the total value of production in 2021 at the farm Chokuz village of Trn, which amounts to 9,330,900.00 denars or 151,230.14 euros, the total variable costs amount to 7,770 000.00 denars or 125,931.92 euros, while the amount of the coverage margin in relation to the realized profit amounts to 1,560,900.00 denars or 25,298.22 euros.

Table 4. Value of the quantitative property of milk production from the Simmental cattle breed in the production year 2022

Description The value of production	Quantity	Measure unit	Total denar	Total Euro
1.Milk	40 (339160)27.8.l, 8479l	l	9 428 648	152 567.11
2. Spent milk for calf feeding	60days x 8=480lx14rt=6720	l	186 816	3 022.91
3. Calves sale	26	head	481 260	7 787.37
4. Sale of barren cows	10 (7000)	kg	700 000	11 326.86

5. Sale of bulls	-	kg	-	-
6. Ars manure	220 000	kg	66 000	1067.96
7. State financial support (milk premium)	339160	l	1 187 060	19 208.09
8. Financial support for breeding high quality cattle	90	head	270 000	4 368.93
			12 319 784	199 349.25

From the economic analysis of the value of production (VP) in the production year 2022, it can be concluded that it amounts to 12,319,784 denars or 199,349.25 euros. Of all the items, the highest value profit has the sale of milk which amounts to 9,428,648.00 denars or 152,567.11 euros and the financial support which amounts 1,096,900.00 denars or 17,765.13 euros.

Table 5. Variable costs of the quantitative property of milk production from the Simmental cattle breed in the production year 2022

Description of Costs	Quantity	Measure unit	Total denar	Total Euro
1. Alfalfa hay	90(463000)–20kg/12kg	kg	4 630 000	74 919.09
2. Corn silage	64 (480200) – 25kg/20kg	kg	2 160 900	34 966.01
3. Concentrate	64(132640) – 8kg/4 kg	kg	2 918 080	47 218.12
4. Costs for veterinary services and medicine		-	200 000	3 236.24
5. Costs for artificial insemination	40	1 ose	48 000	7 76.69
6. Electricity costs	12	1m	96 000	1 553.39

7. Phone costs	12	1m		48 000	776.69
8. Fuel costs	6 000	1		600 000	9 708.73
9. Expenses for other contractual services					
8- Workers	3x12/36	1m		720 000	11 650.48
- Maintenance	12	1m		108 000	1747.57
Total:				11 528 980	186 553.07

*water is used from its own source - a well with a hydrophore

From the economic analysis of the variable costs (VT) in the production year 2022, it can be concluded that it amounts to 11,528,980.00 denars or 186,553.07 euros. Of all the items, the highest value is recorded in alfalfa hay which amounts to 4,630,000.00 denars or 74,919.09 euros, concentrate which amounts to 2,918,080.00 denars or 47,218.12 euros and corn silage which amounts to 2,160,900 denars or 34,966.01 euros. The variable costs in this year are significantly higher due to the increase in the prices of certain products for feeding cattle, fuel and others by 3,758,980.00 denars or 60,923.50 euros per year.

Table 6. Profitability of the quantitative property of milk production from the Simmental cattle breed for the production year 2022

Description	Total denars	Total Euro
Value of production (VP)	12 319 784	199 349.25
Variable Costs (VC)	11 528 980	186 553.07
Coverage margin (CM)	790 804	12 796.18

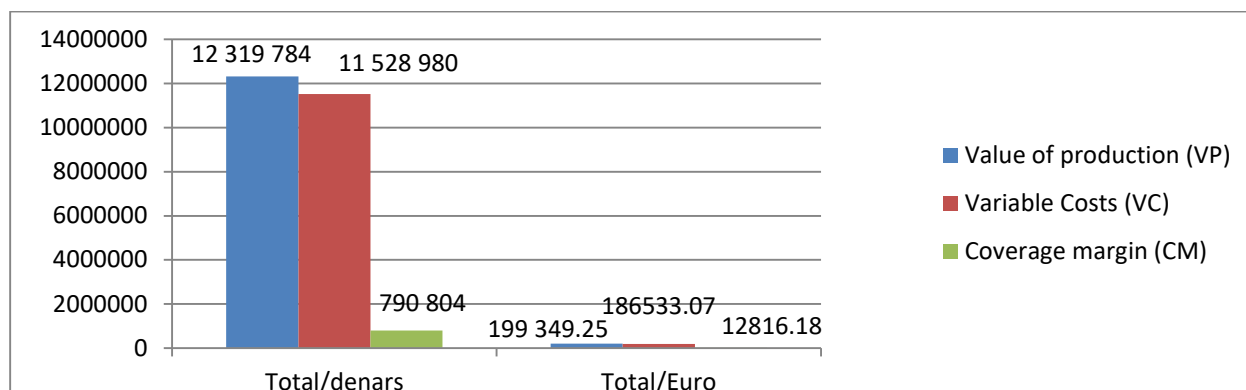


Chart 2. Profitability of the quantitative property of milk production from the Simmental cattle breed for the production year 2022

In table 6 and chart 2, the total value of realized production for the year 2022, on the DOOLChokuz farm in the village Trn is presented, which amounts to 12,319,784 denars or 199,349.25 euros, while the total variable costs amount to 11,528,980 denars or 186,553.07 euros, and the amount of the coverage margin in relation to the realized profit is 790,804 denars or 12,796.18 euros.

Table 7. Average results for profitability of the quantitative property of milk production from the Simmental cattle breed in the production year 2021/2022

Description	Total denars	Total Euro
Value of production (VP)	10 825 342	175 289.69
Variable Costs (VC)	9 649 490	156 242.49
Coverage margin (CM)	1 175 852	19 047.20

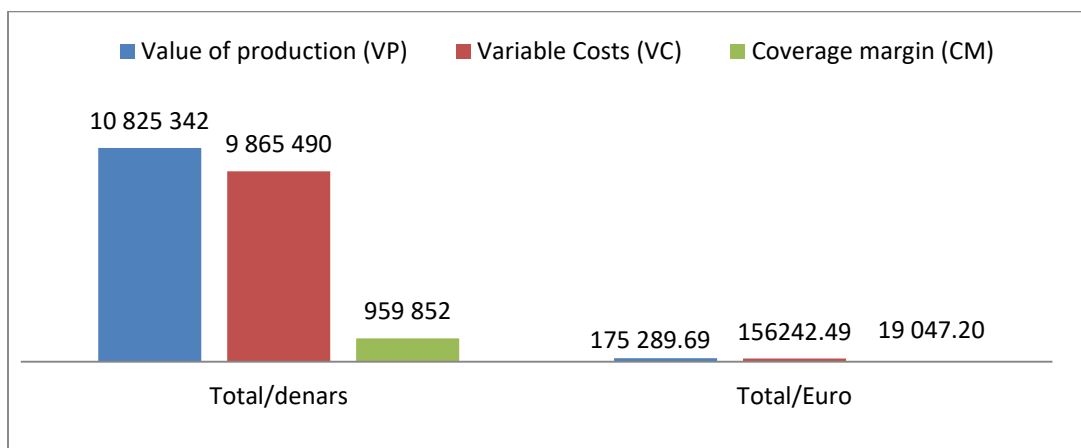


Chart 3. Average results for profitability of the quantitative property of milk production from the Simmental cattle breed in the production year 2021/2022

Table 7 and chart 3 present the analysis of the achieved average financial results for the profitability of the quantitative trait of production of cow's milk from the Simmental breed at the

farm Chokuz village Trn in the two years of research 2021 and 2022, while from the profitability indicators of the production it can be ascertained that the value of the total production is 10,825,342 denars or 175,289.69 euros. The total variable costs amount to 9,649,490 denars or 156,242.49 euros, while the margin of coverage or profit amounts to 1,175,852 denars or 19,047.20 euros. This presents the financial picture of the economic sustainability and profitability of this farm, which is largely conditioned by the financial support from the state.

CONCLUSION

On the individual family farm Chokuz village Trn, municipality of Bitola, in the 2021 production year there were a total of 88 head of cattle, of which 40 were dairy cattle, and 48 were from other categories (calves, barren cows, bulls), while in 2022 there were 90 cattle, of which 40 were dairy cattle, and 50 were from other categories of the Simmental breed.

From the analysis of the obtained average financial results for the profitability of the quantitative property of cow's milk production on the farm in the two years of research 2021 and 2022, from the indicators for the profitability of the production it can be concluded that the value of the total production amounts to 10,825,342 denars or 175,289.69 euros, while the total variable costs amount to 9,649,490 denars or 156,242.49 euros, and the margin of coverage or profit amounts to 1,175,852 denars or 19,047.20 euros. The average financial support for the two years 2021 and 2022 compared to all economic indicators was 13.01%. This means that without financial support, the economic profitability of individual family farms can hardly be achieved despite the unstable low purchase prices of milk and the increase in the amount of variable costs, such as the price of certain products (alfalfa hay, concentrate, corn silage) for nutrition, of cattle, fuel and more. The lower the farm's variable costs, the better the picture of the farm's economic profitability.

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