

PRODUCTION AND ECONOMIC RESULTS OF ORGANIC GOAT FARM IN SKOPJE REGION

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Abstract

The aim of the research within this Study was to establish productive and economic achievements of organic goat farm operating in Skopje region. The researches lasted 3 years (2008, 2009 and 2010) at the farm where around 200 - 300 heads of goats from of all categories of alpine race were bred. Almost the whole milk produced at the farm was processed into organic dairy products, such as: white brined cheese with and without spices and cashkawaal. The organic kids born there were used as kids for livestock products market, kids sold as breeding goats and part of them were retained for own herd reproduction.

The average lactation length in 2008 was 256.5 days, in 2009 - 264.3 days, and in 2010 was 263.3 days. The average daily amount of milk in 2008 was 1.5 liters, in 2009 - 1.56 L, and in 2010 - 1.62 L per head. The average milk lactation in 2008 was 385.02 liters, in 2009 - 412.38 L, and in 2010 - 424.6 L.

Total income and total farm variable costs analysis were accessed, and the farm balance sheet has been produced. In all three years, with the highest percentage of total revenues were represented the revenues generated from the sale of dairy products: in 2008 with 58.7%, in 2009 with 51.2% and in 2010 with 59.2%. Also with the highest percentage in the farm's total costs in all three years of the survey were represented the food costs for the goats: in 2008 with 29.19%, in 2009 with 43.6% and in 2010 with 33.22%.

The farm worked with profit in all three years of research.

Key words: Goats from alpine breed, Milk, Dairy products, Kids, Income, Costs.

1. Introduction

The role of goats in the livestock world is significant and almost there is no country in the world in which they are not bred. The goat production in Republic of Macedonia is characterized by spontaneous and continuous development, and with each day there is greater interest of farmers for breeding goats as a business that provides secure existence and profit. According to the FAO data [14], the number of goats in Republic of Macedonia is about 80,000. The breed composition of goats in the country is based on the domestic Balkan goat with a certain representation of the Alpine breed goats, Saanen and crossbreds of these races.

Basic product obtained from goats is goat's milk (which is commonly processed into white brined cheese, yogurt and cashkawaal) and kids and goat meat.

At the same time, the growing market of organic products increases the interest of the farmers in this type of production as the highest valued, sustainable production. The number of organic producers who are financially supported by the Ministry of Agriculture, Forestry and Water Economy is continuously growing [15] (from 50 farmers in 2005 to 150 in 2007 and 226 in 2008).

The purpose of this research is to show relevant data for production and economic indicators of organic goat farm where goats from Alpine race are bred.

2. Materials and Methods

The survey was conducted at the goat farm "K-farm" in the village Kozle, Skopje region, where about 180 goats of the Alpine race were bred within 3 years (2008, 2009 and 2010). Since 2008 the farm has been certified for organic production.

The breeding system is in barn and on pasture breeding, and the produced quantity of milk is processed in several product types in the dairy within the farm (white brined cheese with and without spices and cashkawaal). The kids born there are used for herd self-reproduction, sold as breeding material, and also as kids intended for the of livestock products market. The nutrition of the goats did not deviate from the usual practice and it was in accordance with the breeding phases during the year. Used feed is of organic origin (alfalfa, pea, vetchling and barleycorn), and the goats were pastured on certified organic pastures. The assigned veterinary, sanitary and zootechnical measures are fully implemented at the farm.

Production results monitoring were conducted by continuous collecting, recording and processing of milk and goat production data during whole research period of time. The lactation control was carried out with A_4 method [4]. The kids production included monitoring of multiple parameters as: total number and gender of the born kids, number of: dead kids, sold kids and kids left for self reproduction.

The obtained results were statistically processed according to the Fisher method (F-test) on the level of probability of $P < 0.05$, $P < 0.01$ and $P < 0.001$ [2].

The monitoring of the economic indicators was conducted by gathering, recording and processing of all types of revenues and expenses of the farm. Therefore, it was prepared analytical calculation based on the variable costs (direct costing - method) and the income statement for each year.

3. Results and Discussion

The average age of milking goats in 2008 was 2,1 years while of the whole herd 2,4 years. In 2009 it was 2,6 years, i.e. 2,3 years, while in 2010 it was 2,8, i.e. 2,2 years respectively.

Milk production at the farm is presented in Table 1.

Table 1. Milk production at the farm in 2008, 2009 and 2010

| Parameter | Year | | | AVERAGE |
|--------------------------|--------|--------|--------|---------|
| | 2008 | 2009 | 2010 | |
| Lactation length (days) | 256,50 | 264,30 | 263,30 | 261.37 |
| Milk yield (L) | 1,50 | 1,56 | 1,62 | 1.56 |
| Daily milk yield (L/day) | 385,02 | 412,38 | 424,68 | 407.36 |

Obtained results for the average length of lactation (256,5; 264,3; and 263,3) compared to the data obtained from the Croatian livestock center in 2008 (259 days) as well as from Mioč *et al.* [9] (2007) - 259 days, Kompan *et al.* (1998) (citation by Andonov [1]) - 258 days, and Memiši *et al.* [8] (2011) - 252 days, are very close.

While testing the variations regarding the lactation length between 2008 - 2009, and between 2008 - 2010 at this farm, statistical importance on level $P < 0.01$ was confirmed. The variation in the lactation length at this farm between 2009 - 2010 had not statistical value ($P > 0.05$).

The average lactation in 2008 was 385,02 liters, in 2009 412,38 liters, and 424,68 liters in 2010. Higher lactation results than the average were reported by Žujović *et al.* [13] which were: 489,52 kg in 2008; 498,59 kg in 2009 and 465,18 kg in 2010, and Skalički *et al.* [11], 750,70 kg. Lower lactation from the one confirmed in the research were reported by Pavliček *et al.* [10], or: 288,26 liters at goats in first lactation; 381,58 gallons at goats in second lactation and 382,96 liters at goats in third lactation, then by Memiši *et al.* [8] 362,83 liters and Mioč [9] 323,54 liters.

While testing the variations regarding the lactation length between 2008 - 2009, and between 2008 - 2010 at this farm, statistical importance on level $P < 0.01$ was confirmed. The variation in the lactation length at this farm between 2009 - 2010 had no significant value ($P > 0.05$).

The obtained results for average daily lactation of the farm during the study (1,5; 1,56 and 1,62 liters) are close to the results obtained by Memiši *et al.* [8] which amounted to 1,24 liters at goats in first lactation, 1,4 kg at goats in second lactation, 1,49 liters in third and 1,52 liters in the fourth lactation.

Anyway, during the following years is expected increasing of milk production at the farm because of the fact that the goats which are bred during the researching period were in first and second lactation, and according Antunac (1994) (cited by Pavliček, [10]), Margetin and Milerski (2000) (cited by Pavliček, [10]), Andonov *et al.* [1], Herceg Martina [3] and Mekić *et al.* [7] (2010), the milk production of the goats increases with increasing the number of lactations in sequence.

Kids' production is presented in Table 2.

Table 2. Kid's production

| Kids | Year | | |
|-----------------------|------|------|------|
| | 2008 | 2009 | 2010 |
| Live born | 148 | 179 | 186 |
| - male kids | 83 | 73 | 98 |
| - female kids | 65 | 106 | 88 |
| Dead after birth | 8 | 10 | 12 |
| Dead during the year | 10 | 15 | 13 |
| Bred kids | 130 | 154 | 161 |
| Twin kids | 26 | 92 | 84 |
| Sold for meat | 50 | 60 | 66 |
| Sold for breeding | 50 | 40 | 45 |
| Left for reproduction | 30 | 54 | 50 |
| - male kids | / | / | / |
| - female kids | 30 | 54 | 50 |

According to data in Table 2, in 2008 at the farm were born 148 kids, of which 43.92% are female and 56.08% male. Of them, 9.63% were born as twins. The percentage of mortality was 5.41% and during the year it increased to 12.16%. The farmer kept 30 kids (23,07%) for herd self-reproduction.

In 2009, from the total number of kids (179), 40.78% were born as female, while 59.22% as male kids. The percentage of the twins was 17.57%, while the percentage of mortality was 13.97%. Of the total number of kids raised, 30.17% were kept by the farmer for self reproduction.

In 2010, 186 kids were born at the farm, of which 88 (47.31%) were born as female, while 98 (52.69%) as male kids. The percentage of the twins was 45.16% while as triplets were born 6.45% (in 2008 and 2009 there were no kids born as triplets). This year, the percentage of mortality was 13.44%. In 2010, the farmer kept 50 female kids for herd self-reproduction.

The percentage of twins confirmed by Vnučec *et al.* [12], which is 54.84%, is significantly higher than the values obtained in this survey, especially in 2008 and 2009.

The percentages of fertility, barrenness and conception in 2008, 2009 and 2010 are presented in Figure 1.

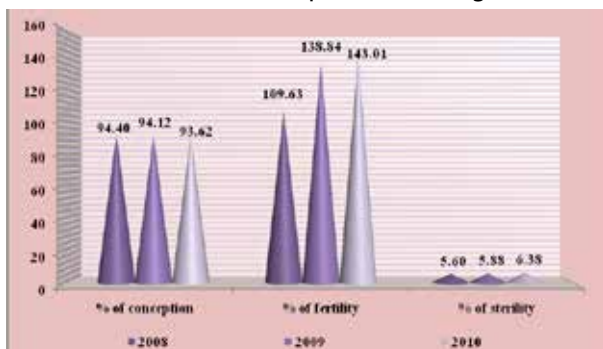


Figure 1. Percentage of fertility, barrenness and conception

Results for fertility of goats in the research compared with the results of Mekić *et al.* [7], in which the fertility of the Alpine breed goats during the first year is around 130%, and later the same increased, are very similar. Simultaneously, Vnučec *et al.* [12] established higher fertility than the obtained (159.1%) at Alpine breed goats bred in Croatia.

The revenues of the farm, during the research are presented in Table 3.

Table 3. Total revenues of the farm

| Types of revenues | Year | | |
|---|------------|------------|------------|
| | 2008 (%) | 2009 (%) | 2010 (%) |
| Revenues from sold kids | 26.3 | 30.2 | 25.1 |
| Revenues from sold dairy products | 58.7 | 52.1 | 59.2 |
| Revenues from sold goats and male goats | 2.3 | 1.9 | 1.8 |
| Additional revenues | 12.7 | 15.8 | 13.8 |
| TOTAL | 100 | 100 | 100 |

According to the obtained results for the total revenues of the farm during the research, presented in Table 3, it can be concluded that the highest portion of the total revenue have the revenues from the sale of dairy products produced at the farm. At the second place by representation are the revenues generated from the sale of kids (like goats for meat and breeding kids).

The total variable costs at the farm are presented in Table 4.

Table 4. Total variable costs at the farm

| Types of costs | Year | | |
|---|------------|------------|------------|
| | 2008 (%) | 2009 (%) | 2010 (%) |
| Costs for nutrition of goats | 29.19 | 43.63 | 37.22 |
| Costs for pasturing | 0.61 | 0.55 | 0.54 |
| Costs for water | 0.82 | 0.78 | 0.66 |
| Costs for prevention and veterinary measures | 3.84 | 3.82 | 3.50 |
| Costs for wages of the employees | 27.93 | 26.72 | 22.44 |
| Costs for cheese production | 24.57 | 14.75 | 23.53 |
| Costs for cashkawaal production | 6.42 | 3.15 | 6.18 |
| Other variable costs | 6.07 | 6.07 | 5.48 |
| Chemical and microbiological analysis of dairy products | 0.55 | 0.52 | 0.44 |
| Total | 100 | 100 | 100 |

According to data from Table 4, in all three years of the survey, in the total variable costs with the highest percentage were represented the costs for nutrition of heads. The second place takes the cost for employees' wages, while in 2010 the costs for cashkawaal production. The results from the research referring the food costs are similar to results obtained by Martinovska [6], who states that the costs for food in livestock production in Republic of Macedonia in total variables are represented with 50.03%.

When referring to costs of the farm, it is recommended the same to be lowered, if possible. This is especially for food costs of the animals. Namely, making a business plan for the needs of animal feed would lower the costs for the same, i.e. the animals would take the food they need and there would not be too much food wastage. According to Krstic *et al.* [5], the necessity of making a business plan for animal feed is especially manifested while breeding the animals in climate conditions in some parts of the year when there is no vegetation.

According to the results for total revenues and expenses on the farm made during the research, the balance sheet of the same is prepared and the same is in all three years. Balance sheet of the farm is shown in Figure 2.

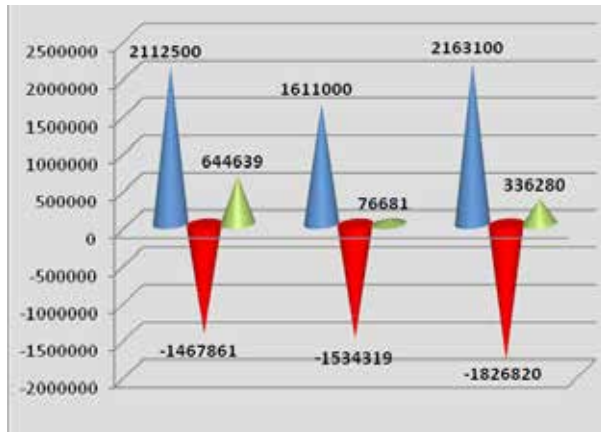


Figure 2. Farm balance sheet

4. Conclusions

1. The average lactation length expressed in days was 256.5 days in 2008; 264,3 days in 2009; while in 2010 it was 263.3 days.
2. The average lactation for all three years of the research was 385.02 liters in 2008; 412.38 liters in 2009; and 424.68 liters in 2010.
3. The average daily lactation in 2008 was 1,5 liters; in 2009 it was 1.56 L; while in 2010 1.62 L.
4. The most represented of all in total revenues in all three years of the researching period were the revenues from sold dairy products (58.7%, 52.1% and 59.2%).
5. During the all three years of the research, the highest percentage of representation in the total variable costs had the costs for animal feed.
6. The balance sheet of the farm during the all three years of the analyzed period is positive.

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