

PRODUCTION AND ECONOMIC RESULTS OF ORGANIC GOAT FARM IN GEVGELIJA REGION

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Abstract

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. The aim of the research was to establish productive and economic achievements of organic goat farm operating in Gevgelija region.

The research lasted 3 years (2008, 2009 and 2010) at the farm where around 33 heads of goats from of all categories of Alpine race are bred. Almost the whole milk produced at the farm is sold to local dairy. The organic kids born there are used as kids for market of livestock products, kids sold as breeding goats and part of them are retained for own reproduction in the herd. The average lactation length in 2008 was 280.4 days, in 2009 was 289 days, and in 2010 was 256.5 days. The average daily milk production in 2008 was 1.97 L, in 2009 was 1.98 L, and in 2010 was 1.44 L per head. The average milk lactation in 2008 was 552.75 L, in 2009 was 571.27 L, and in 2010 was 379.22 L. 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.

During 2008, the highest percentage (48%) of total incomes were incomes from the sale of dairy products (48%), while in 2009 and 2010 the highest percentage (46.7% and 55.5%) where incomes generated from the sale of kids. The highest percentages in the farm's total costs in all three years of the survey were represented the food costs for the goats: in 2008 with 44.1%, in 2009 with 47.03% and in 2010 with 49.39%.

The farm worked with profit in all three years of the research. The results showed that goat breeding in Republic of Macedonia has opportunities for further development.

Key words: Goats from alpine breed, Milk, 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 [4], the number of goats in Republic of Macedonia is about 65.000. 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 400 in 2013).

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.

The farm worked with profit in all three years of research. The results show that goat breeding in Republic of Macedonia has opportunities for further development.

2. Materials and Methods

The survey was conducted at the goat farm "Alpina" in the village Prdejci, Gevgelija region, where about 33 goats of the Alpine race were bred within 3 years (2008, 2009 and 2010). Since 2008 the farm has been in conversion for organic production.

The breeding system is in barn and on pasture breeding, and the produced quantity of milk is sold to local dairy. 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 2.4 years while of the whole herd 2.7 years. In 2009 it was 3.0 years, i.e. 2.9 years, while in 2010 it was 3.3, i.e. 3.1 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) | 280.40 | 289.00 | 256.50 | 275.30 |
| Milk yield (L) | 1.97 | 1.98 | 1.44 | 1.80 |
| Daily milk yield (L/day) | 552.75 | 571.27 | 379.22 | 501.08 |

Obtained results for the average length of lactation (280.0; 289.00; and 256.50) compared to the data obtained from the Croatian livestock center in 2008 (259 days) as well as from Mioč *et al.* [9] - 259 days, Kompan *et al.* (cited by Andonov [1]) - 258 days, and Memiši *et al.* [8] - 252 days (the variation of 202 to 302 days), are very close.

While testing the variations regarding the lactation length between 2008 - 2009, between 2008 - 2010 and between 2009 - 2010 at this farm, statistical importance on level $P < 0.001$ was confirmed.

The average lactation in 2008 was 552.75 liters, in 2009 571.27 liters, and 379.22 liters in 2010. Approximate 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 litres and Mioč [9] 323.54 litres.

While testing the variations regarding the lactation between 2008 and 2010, and between 2009 and 2010 at this farm, statistical significance on level $P < 0.001$ was confirmed. The variation in the lactation at this farm between 2008 - 2009 had no significant value ($P > 0.05$).

The obtained results for average daily lactation of the farm during the study (1.97; 1.98 and 1.44 liters) are higher 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. The obtained results for average daily lactation of the farm during the 2008 and 2009 year are very close to the results obtained by Herceg Martina [3] (2010) which amounted to 2.08 liters.

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.

According to data in Table 2, in 2008 at the farm were born 38 kids, of which 57.9% are female and 42.1% male. Of them, 68.42% were born as twins. The farmer kept 3 kids (7.89%) for herd self-reproduction.

In 2009, from the total number of kids (49), 53.1% were born as female, while 46.9% as male kids. The percentage of the twins was 69.4%, while the percentage of mortality was 4.08%. Of the total number of kids raised,

4.26% were kept by the farmer for self reproduction.

In 2010, 62 kids were born at the farm, of which 29 (46.77%) were born as female, while 33 (53.23%) as male kids. The percentage of the twins was 61.29% while as triplets were born 14.52% (in 2008 and 2009 there were no kids born as triplets). This year, the percentage of mortality was 6.45%. In 2010, the farmer kept 3 female kids for herd self-reproduction.

The percentage of twins confirmed by Vnučec *et al.* [12], which is 54.84%, is slightly lower than the values obtained in this survey.

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

Table 2. Kid's production

| Kids | Year | | |
|-----------------------|------|------|------|
| | 2008 | 2009 | 2010 |
| Live born | 38 | 49 | 62 |
| - female kids | 22 | 23 | 29 |
| - male kids | 16 | 26 | 33 |
| Dead after birth | / | 2 | 4 |
| Dead during the year | / | / | / |
| Bred kids | 38 | 47 | 58 |
| Twin kids | 26 | 34 | 38 |
| Sold for meat | 25 | 31 | 34 |
| Sold for breeding | 10 | 14 | 21 |
| Left for reproduction | 3 | 2 | 3 |
| - male kids | / | / | / |
| - female kids | 3 | 2 | 3 |

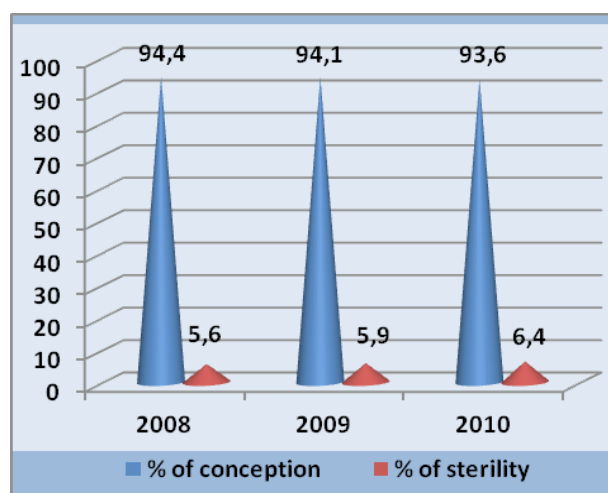


Figure 1. Percentage of conception and sterility

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

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 kids (like goats for meat and breeding kids) from the sale of milk and dairy products produced at the farm in 2009 and 2010 year. At the second place (in 2009 and 2010 year) by representation are the revenues generated from the sale of dairy products produced at the farm. In 2008 year results have opposite trend.

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

Table 3. Total revenues of the farm

| Types of revenues | Year | | |
|--|-------------|-------------|-------------|
| | 2008 (%) | 2009 (%) | 2010 (%) |
| Revenues from sold kids | 35.2 | 46.7 | 55.5 |
| Revenues from sold milk and dairy products | 48.0 | 35.0 | 28.2 |
| Additional revenues | 16.8 | 18.3 | 16.3 |
| TOTAL | 100 | 100 | 100 |

Table 4. Total variable costs at the farm

| Types of costs | Year | | |
|--|--------------|--------------|--------------|
| | 2008 (%) | 2009 (%) | 2010 (%) |
| Costs for nutrition of goats | 44.12 | 47.03 | 49.39 |
| Costs for pasturing | 1.12 | 1.16 | 1.09 |
| Costs for water | 3.70 | 2.61 | 2.38 |
| Costs for prevention and veterinary measures | 5.32 | 5.95 | 6.20 |
| Costs for cheese production | 7.74 | 6.40 | 6.30 |
| Other variable costs | 39.00 | 36.85 | 34.64 |
| 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 other variable cost. 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.

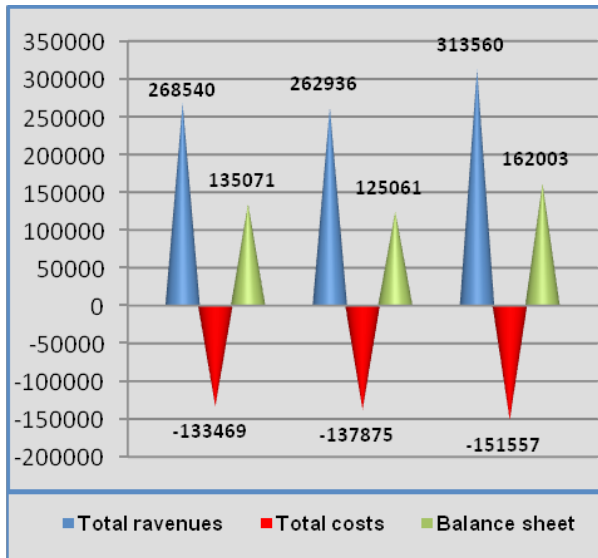


Figure 2. Farm balance sheet

4. Conclusions

- The average lactation length expressed in days was 280.40 days in 2008; 289.00 days in 2009; while in 2010 it was 256.50 days.

- The average lactation for all three years of the research was 552.75 liters in 2008; 571.27 liters in 2009; and 379.22 liters in 2010.

- The average daily lactation in 2008 was 1.97 liters; in 2009 it was 1.98 L; while in 2010 1.44 L.

- Most represented of all in total revenues in 2008 were the revenues from sold milk and dairy products, but in 2009 and 2010 year that were the revenues from sold kids.

- During all three years, the highest percentage of representation in the total variable costs had the costs for animal feed.

- The balance sheet of the farm during the all three years of the analyzed period is positive.

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