

RESEARCH ON MILK PRODUCTION AT GOATS FROM CARPATHIAN BREED IN RELATION WITH BREEDING SYSTEM

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Abstract

This paper aims to quantify the qualitative and quantitative parameters of milk production at goats from Carpathian breed in relation with the breeding system (extensive versus semi-intensive). To determine the total quantity of milk, the milk production control it included suckling period of kids and milking period of goats. For determining the quality of milk it was made the analysis of chemical composition of milk in the main constituents, namely water and dry matter, content of fat, protein, lactose and minerals. The biological material studied in this paper was represented by the adult goats from Carpathian breed belonging of two private farms from the south region of country. The size of the control group during the whole lactation was 25 heads for each farm. The research took into account two farms of goats differentiated by breeding system practiced, respectively extensive and semi-intensive. The obtained results showed that regarding the quantitative milk production the best performance was achieved by animals from semi-intensive farm (253.21 liters versus 208.50 liters) and in terms of milk quality by the animals from extensive farm.

Key words: goats, milk production, lactation, milk parameters, breeding system

INTRODUCTION

The importance of goat breeding lies in the many products that this species provides to the human: milk, meat, hides, furs, hair production, etc., products of high quality, without which the humanity could not survive (Taftă, 2008). Both globally and also in our country these products began to be required increasingly more lately by a large number of people of all ages, which explains the increase of goats number in recent years (Aziz, 2010; Popescu, 2010).

Thus is for the first time in our country when a domestic animal species exceeds numeric comparative to 1989, in 1990 the number of goats was about 1,017,000 heads, reaching in 2013 to approx. 1.313 million head, an increase of approx. 30%. Also, there was a substantial increase of milk and meat productions which reached to 248,000 tons and respectively to 7000 tons.

In our country the main direction of goats breeding is for milk production, which depends largely, both quantitative and qualitative, by the

system of goats exploitation practiced in farms. Goat farms in Romania are still in their vast majority of small and medium size and the applied operating technology are generally dependent by semi-intensive and extensive systems of exploitation (Răducuță, 2004; Răducuță and Ghiță, 2010).

In this context the paper aims to quantify the qualitative and quantitative parameters of milk production at goats from Carpathian breed in relation with the operating system of exploitation.

MATERIALS AND METHODS

The research took into account two private goat farms from the south region of country differentiated by breeding system practiced, respectively extensive (from Prahova County) and semi-intensive (from Giurgiu County). Biological material studied in this paper was represented by the adult goats from Carpathian breed.

The size of the control group during the whole lactation was 25 heads for each farm. To

determine the total quantity of milk, the milk production control it included suckling period of kids and milking period of goats.

The amount of milk in suckling period was appreciated through the weight gain registered by kids at 28 days and at weaning date (60 days) compared with birth weight.

The amount of milk during the milking period was determined through monthly individual control of milk, respectively by goats milking in the morning and the evening day of control, according to the official standard method of control A4.

For determining the quality of milk it was made the analysis of chemical composition of milk in the main constituents, namely water and dry matter, content of fat, protein, lactose and minerals.

RESULTS AND DISCUSSIONS

The farm from Prahova County exploits animals of Carpathian breed and practicing an extensive breeding system.

This system consisting of maintenance of goats in separately herds or together with sheep on mountain pastures in summer (June to September), at the sheepfold, where descends on the pastures, meadows and occasional valleys or hill areas and in the winter animals stay indoors, being fed particularly with fibrous forages.

In the extensive system practiced in Prahova farm goats receiving approx. 0.2-0.3 kg of cereal grains only for 15 days before calving and that is all quantity of concentrates administrated at goats for the entire year in this type of farm.

The farm from Giurgiu County exploits also goats from Carpathian breed and uses a semi-intensive exploitation system of animals. In this farm animals are kept indoors of shelter during winter (requires annexes of storage for hay, coarse forage, concentrates and silage) and in spring-summer-autumn goats are maintained on natural pastures, meadows and occasional pastures, which are successively used.

Compared with the farm from Prahova County in the farm from Giurgiu County, where is practiced semi-intensive operating system, goats receive a daily amount of approx. 0.3 kg cereal grains throughout the calendar year.

The data obtained from the investigations show that average production of milking milk at goat populations from Carpathian breed varies from one farm to another farm. Thus for goats from extensive farm is 165.96 liters and higher with 20.9% in the case of goats from semi-intensive farm, respectively 200.64 liters (Table 1).

Table 1. Total milk production and milking milk at goats population from extensive farm (Prahova County)

No.	Month of lactation	Prahova Farm	
		liters	%
1	May	40.31	24.29
2	June	36.43	21.95
3	July	35.87	21.61
4	August	31.54	19.01
5	September	17.61	10.61
6	October	4.20	2.53
7	Total milking milk (liters)	165.96	
8	Average milk production (liters)	208.50	
9	Lactation length (days)	226.26	

Average milk production at goats from extensive farm is 208.50 liters obtained in an average duration of lactation by 226.26 days and an average daily milk production of 0.92 liters (Table 1).

Regarding the quantity of monthly and daily milking milk in the case of goats from extensive farm, the results show that, the largest quantity of milk is harvested in May (24.29% of total) when recording the peak of lactation (Table 1 and Figure 1).

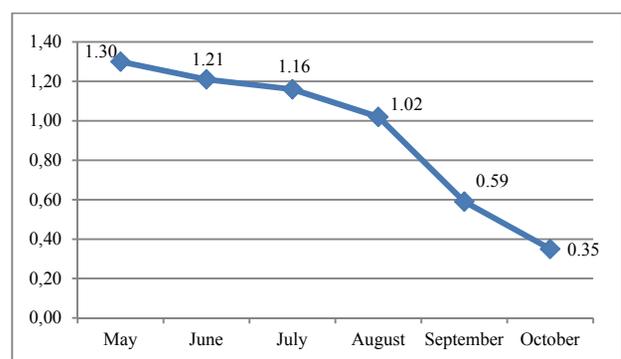


Figure 1. The curve of average daily milking milk production in Prahova farm (liters)

Average milk production at goats from semi-intensive farm is 253.21 liters obtained in an average duration of lactation by 233.34 days and an average daily milk production of 1.09 liters (Table 2).

Table 2. Total milk production and milking milk at goats population from semi-intensive farm (Giurgiu County)

No.	Month of lactation	Giurgiu Farm	
		liters	%
1	May	44.07	21.96
2	June	45.61	22.73
3	July	42.89	21.38
4	August	33.58	16.74
5	September	25.18	12.55
6	October	9.31	4.64
7	Total milking milk (liters)	200.64	
8	Average milk production (liters)	253.21	
9	Lactation length (days)	233.34	

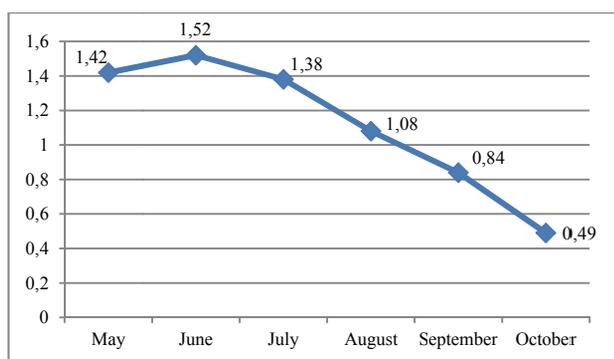


Figure 2. The curve of average daily milking milk production in Gurgiu farm (liters)

Regarding the quantity of monthly and daily milking milk in the case of goats from semi-intensive farm, the results show that, the largest quantity of milk is harvested in June (22.73% of total) when recording the peak of lactation (Table 2 and Figure 2).

In conclusion, regarding the total milk production, it can be seen that the average milk production of goats from semi-intensive farm type (Giurgiu County) is with approx. 21.4% higher compared to that from goats from extensive farm type, the difference between two populations being very significant ($P < 0.001$).

Differences between farms are mainly caused by feeding conditions, respectively in semi-intensive farm are used for grazing improved pastures (in relation with productive level) and concentrates are used over a long period during the calendar year.

On the contrary for the goats from extensive farm are used only for grazing natural pasture and concentrates are given only for a very short period (2 weeks).

Compared with other researches on milk production at our local Carpathian breed, our results are with about 4.8% lower in the case of goats from extensive farm and with 10.8% in the case of goats from semi-intensive farm (Taftă, 2002; Zamfir, 2014).

Research on milk quality was conducted only during milking period of goats. For analysis of milk quality were carried out determinations regarding chemical composition of milk in the main constituents, namely water and dry matter, the content of fat, protein, lactose and minerals.

According to the results obtained from quality of milk analysis it is found that goat's milk from extensive farm type has a content in dry matter with 2.14% higher compared to that of semi-intensive farm type. As a result, most of other components of dry matter (fat, protein and lactose) are found in greater amounts in milk produced by goats from extensive farm.

The biggest difference (4.3%) is recorded for the fat content, which leads to the conclusion that in terms of milk quality the milk obtained in the extensive farm is superior to that obtained in semi-intensive farm (Table 3 and Figure 3).

Table 3. The chemical composition of goat milk according to the type of farm

No.	Farm	Water (%)	Dry matter (%)	Fat (%)	Protein (%)	Lactose (%)	Minerals (%)
1	Prahova Farm	86.66	13.35	4.60	3.56	4.23	0.96
2	Giurgiu Farm	86.93	13.07	4.41	3.50	4.18	0.98

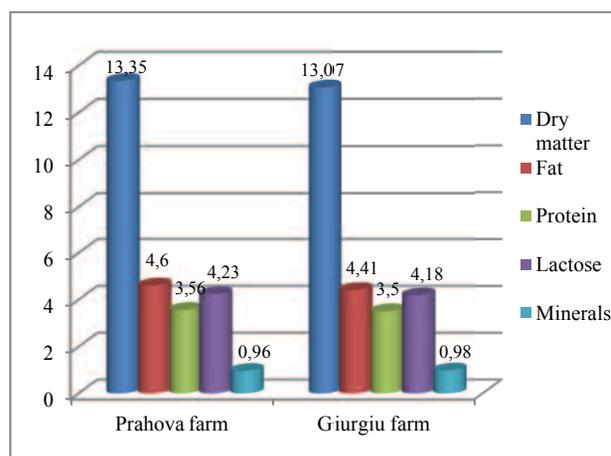


Figure 3. The main components of milk dry matter according to the farm type (%)

Compared with other researches on milk quality at our local Carpathian breed, our results regarding the content of dry matter are with about 4.7% lower in the case of goats from semi-intensive farm and with 2.7% in the case of goats from extensive farm (Zamfir, 2014).

CONCLUSIONS

Milk yield at goats from semi-intensive farm is with approx. 21.4% higher compared to that from goats from extensive farm, the difference between two populations being very significant ($P < 0.001$).

Differences between farms regarding milk yield are mainly caused by feeding conditions, which are net superior in the semi-intensive system compared with those used in the extensive system.

Goat's milk from extensive farm has a content in dry matter with 2.14% higher compared to that of semi-intensive farm type. As a result, most of other components of dry matter (fat, protein and lactose) are found in greater amounts in milk produced by goats from extensive farm.

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