

# Morpho-productive Characteristics of Saanen Goats in the South of Romania

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## Abstract

Within the breed pattern of goat livestock exploited at national level, the most important share is represented by rustic non-improved breeds, which, however having an important variability under dimension report, we may state, at the same extent, about productions, especially milk ones. Thus, small productions request crossings, at least infusive ones, with the most performant breeds such as Saanen, whose performances are remarkable in the specialized farms from the origin country. In the present work, the analysis object is constituted by Saanen livestock exploited in Gîrbovi – Ialomița, where there were observed the main morpho-productive characteristics of the breed and the performance way, especially milk production, during the whole lactation and its quality, as well as the main body measurements. The main effected somatometric measurements emphasized a conformation, typically dolico-morphic, reflected by the analysed body indexes, on the basis of the average body dimensions such as: live weight  $57.375 \pm 0.23$  Kg, as an average, height at the crupper  $67.64 \pm 0.38$  cm, crupper length  $69.25 \pm 0.41$  cm, oblique body length  $70.98 \pm 0.38$  cm, head length  $21.35 \pm 0.14$  cm, head width  $14.58 \pm 0.18$  cm, chest width  $18.56 \pm 0.15$  cm, croup width  $20.26 \pm 0.14$  cm, thoracic perimeter  $89.17 \text{ cm} \pm 0.32$  cm and cane perimeter  $10.52 \pm 1.53$  cm, resulting a dolico-morph body structure. The total production is as an average of 500.39 litres and the medium milk production during the 212 lactation days of almost 7 months was of about 2.36 L/head/day during the whole lactation and during each month, the average productions were: November 58.05 L, December 70.47 L, January 92.30 L, February 45.10 L, March 86.67 L, April 100.37 L and May 46.42 L. These performances demonstrate a lactation curve with two peaks, representing a certain high milk potential compared to the local breeds, but very much under the performances of this breed in the specialized farms. The milk chemical composition during the latest lactation months were: non-fat dry matter 8.33%, protein 3.27% and fat 3.54%. This case, the high milk potential of the breed may be compared to some non-improved livestock, aspect which shows an exploitation where the feeding and managing conditions are very poor for specialized animals or in the case of the purchased material, it is much more under our expectations.

**Keywords:** body structure, goat production, milk production.

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## 1. Introduction

According to FAO statistics from the last 20 years, the number of goats increased worldwide by 18.9%. The only continent who records a decrease, in the last twenty years, in number of goats is Europe (-16.4%). At the E.U. level, is recording the greatest decrease 17.4% from total European effective. Countries with a remarkable

increasing are Holland (100%), Germany (71%), Estonia (71%), and Romania (53.4%, 4th place). At the other pole, regarding the important decrease of goats populations, are our neighbours from the South and South-West of the Danube, Bulgaria (59%) and Hungary (55.6%) [1-3].

The actual rise in our country is due to large imports, in the last period, of breeds specialized in milk production. All this imported individuals became from well-known European breeds. This is the beginning of specialized farms, like in West Europe, who are contributing to the development of the processing units of special milk products

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and also for the breeding of Romanian breed Carpatină. We must underline here, that this represent the majority, in Romanian goat herds, and is exploited extensively and mixed in small effective (92%), and in a smaller part in big farms(only 4% from Romanian goats farms are larger than 100 heads). When we talk about mixed exploitation, we refer to the fact that they are operated in large part with sheep [4].

## 2. Materials and methods

The study was performed on an effective of 87 goats, Saanen breed, imported by farm A.F. Cojocaru Ovidiu, from Gîrbovi, Ialomița County. The entire herd of goats, that was subject to investigation of the livestock stood at the first lactation and the actual imported, consisted of young females at first gestation.

The main studies were focused on characteristics related to:

- body conformation, and the main body measurements ,
- milk production potential, milk production through quantitatively and qualitatively characteristics,
- reproductive issues and specifically regarding the prolificacy,
- dynamic of growth process in young goats, on the first three months of life by registering daily gain,
- fibrillar composition of follicle lining in specialized breeds [2].

## 3. Results and discussion

### *Prolificacy*

Even some reproductive aspects of breeding, regarding reproductive parameters and the growth process dynamic were described in detail in a previous paper, we will underlined the differences between biological parameters as a standard of Saanen breed, are included for this character between 150 -170% while those obtained from our sample are only 128%, values who approach sample to Romanian breed Carpatină (128%) [2,5]. This highlights a lack of selection for material sold or available at farm level which also have populations by region, for the same group of animals, that of pregnant youth females.

### *Dynamic of growth process*

Its evolution, at the reviewed young goat level, showed that, since from birth, Saanen individuals have an obvious sexual dimorphism, differences being in average approx. 15% between the sexes [2]. In what concerns the overall appearance of the growth process we emphasize that: males grow to approx. 2.5 times, respectively female approx. 2.4 times in the first month of life considered a pretty good start for a dairy goat breed. The best average daily gain recorded in both sexes of young goats was recorded in the 2nd month of life, thanks to good milk producing potential of mothers and precocity of young goats to for forage consumption due to early development of enzymatic equipment.

Observing the evolution of daily gain, recorded for both sexes, we found that there is a peak of growth in the second month, followed by an ascending order from 127g to 198g in males, then descends sharply in the third month of lactation to 122g per day, and that shows a good start of growth process, being associated with selective consumption and other types of food (other than milk). Same phenomenon was recorded in young females, ascending during the first two months as rising from 109g, in the first month to 173g in the second month, and to 106g per day in the 3rd month. We not record the same thing about evolution in the third month of lactation, so that it is reduced in size by over 38% in young male and almost 39% of the female. This is primarily due to cessation, for both categories, of milk consumption but also to lack of knowledge and absence of application of a quality feeding especially at this critical time for kids [1,2].

Comparing growth process dynamic of imported breeds to that of cultural breed Carpatina, we can say that, even if imported goats breeds are specialized for milk production, the growth process in young goats does not differ much, not even on monthly daily gain, although the precocity of the breed should demonstrate a good efficient enzyme luggage. This would allow them to fee earlier with other types of forage in farm conditions, but perhaps the lack of knowledge or inability to feed young goats with quality forage lead to such situations [2,6].

### Body measurements

According with body size measurements, in the farm with goats imported at first lactation, we found aspects that highlight the conformation of population, if they fall between characteristics of the breed regarding the main body indices determined after our measurements. Thus the main body sizes of population, are presented as the average population characters:  $57.37 \pm 0.23$  kg body weight, wither height  $67.47 \pm 0.38$  cm,  $69.25 \pm 0.41$  cm, oblique body length  $70.98 \pm 0.38$  cm, head length  $21.35 \pm 0.14$  cm, head width  $14, 58 \pm 0.18$  cm; chest width  $18.56 \pm 0.15$  cm, width at croup  $20.26 \pm 0.14$  cm  $\pm 0.32$  cm  $89.17$  thoracic perimeter, canon bone perimeter  $9.03 \pm 0,058$ . Are body measurements are between characteristic limits of the breed, but have greater variability due to imports made from more farms [2,6]. Average measured values demonstrate a good conformation, typical for females for milk production, estimated that only two synthetic body indices: side body format index 106% and 10.1% bones index. It is revealed a solid backbone, a dolico-morph conformation typical for dairy milk goat breeds [2].

Analyzing that it is a fairly young population, at the first lactation, and does not reached adult size, these values are close to Saanen breed or even considered typical for compliance with standards of breed, but have greater variability their reasons mentioned above.

### Milk production

Is the main objective of analysis performed in the studied population, because the goal of exploitation. Regarding productive longevity of the population, for all lactation period, (seven months or 212 days of lactation), it was found significant differences between most valuable ecotypes of our cultural breed. Beginning of lactation occurs late, in autumnal months, already when indigenous breeds begin reproductive campaign, being another convenient, somehow favourable, which is suspended in May, an opposite phenomenon to local populations.

By months, milk production is as follows: November 58.05 L, December 70.47 L, January 92.30 L, February 45.10 L, March 86.67 L, April 100.37 L and May 46.42 L, with an average total production at 500.39 l for the entire lactation (see Figure 2).

### Lactation curve

This indicator shows the lactation curve with a normal evolution for improved breeds, but who suddenly drops almost at half (instead of maintaining at the same parameters at least three months, typically for the most valuable dairy goats breeds that have a slowly decreasing after the 5th or 7th month of lactation), then returns to a better production at the population level and then decreases relatively sharply A (see figure 1) [2].

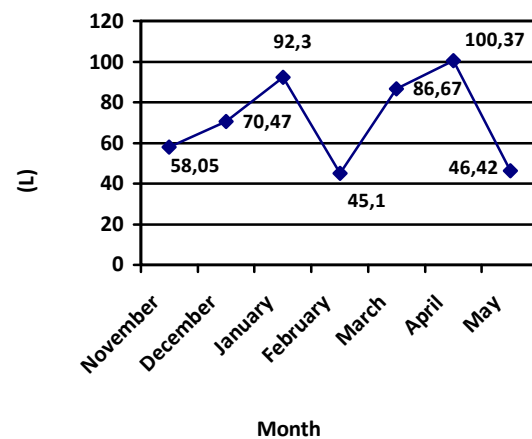


Figure 1. Lactation curve variation

An interesting aspect is the lactation curve which is a graph with two peaks, is not desirable in dairy goats' breeds. Motivation is a faulty management of critical situations in February with great precipitation that disrupted entire production process. Any disruption of the technological flow regarding especially alimentation, watering and milking, can be considered vital for farm animal.

Daily average production, on the 212 days of lactation is 2.36 L/goat/day, which can be considered a modest production regarding to the productive potential of the breed, but can not be satisfactory because of the high price at acquisition of females.

Total milk production is the most important indicator because of outstanding race performances for milk production. Total average production per year is 500.39 L and the medium milk production during 212 days of lactation (almost 7 months) was of about 2.36 L/ head / day during the lactation (see Figure 2). This production can not be considered as a performance especially at a race with a remarkable potential, aspect that requires a lot of shortcomings in the management report, as has been mentioned, or

inability to adapt biological materials on the operating conditions given.

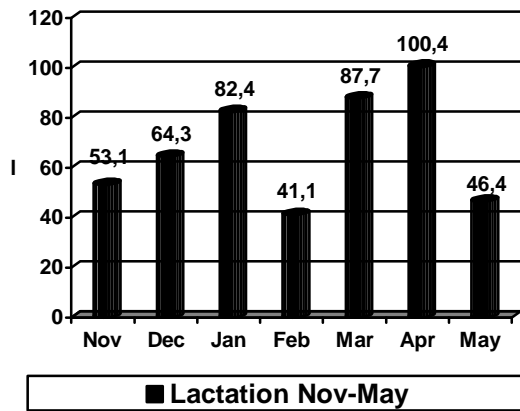


Figure 2. Monthly average milk productions

In contrast, for this population of specialized goats, their physiological particularities (i.e. reproductive plan) are to year and produce milk in the off-season, provide a better justification for new acquisitions and imports of modern breeds, but also their use in improving cultural populations

*Qualitative composition of milk*

Regarding chemical composition of milk, we not register significant differences, given the fact that

the breed is performant, and somewhat chemicals composition might be slightly weaker.

Average milk composition elements, throughout the stabulation period or winter (see Figure 4), on milk fat, occur in some individuals, reaching 5%. Are animals that have a fatter milk especially during feeding of stock, then may decrease by approx. 1.5% but still remaining individuals who can give fat milk (see Figure 3).

*Chemical composition*

The main component elements of goat's milk were determined on the control day. (see Figure 4). The milk chemical composition during the lactation of May month was: non-fat dry matter 8.33%, protein 3.27%, fat 3.54% and density 1.03112 [2]. The latter are a type substantial contribution as a quality aspect in goats 3, 4 and 5 [2].

Analysing histograms for milk production, both in the morning and in the evening of the first month of production, we observe that data are normally distributed, however, spotlighted differences of the extreme series allow a better selection with animals distribution in stocks but also with specific production [1,2].

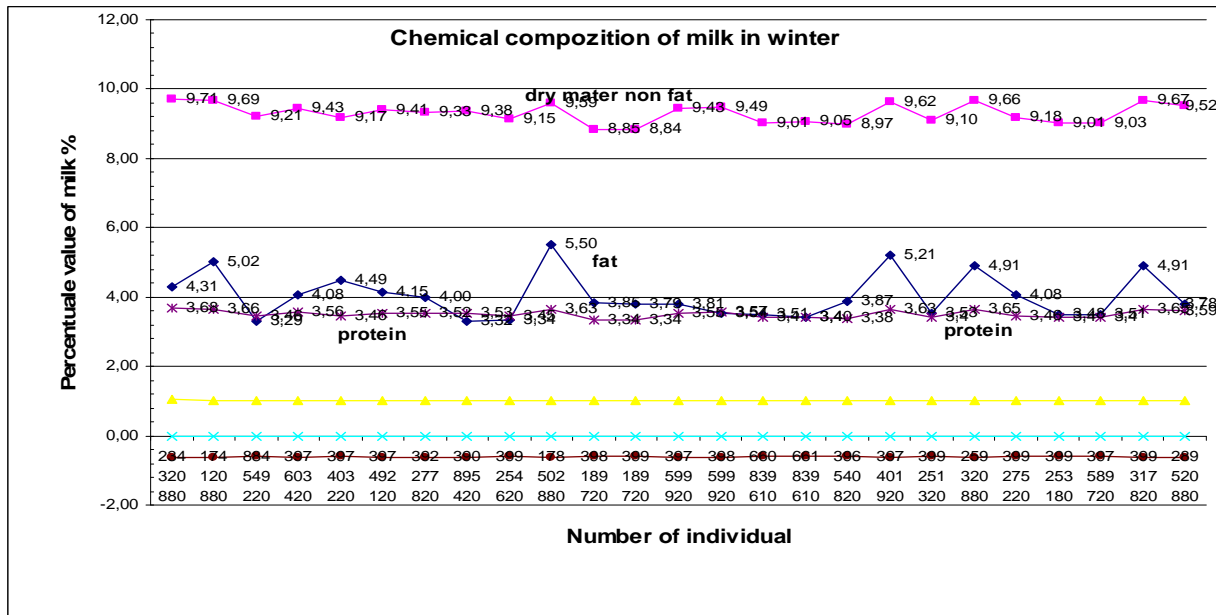


Figure 3. The chemical composition of Saanen goat milk in winter season

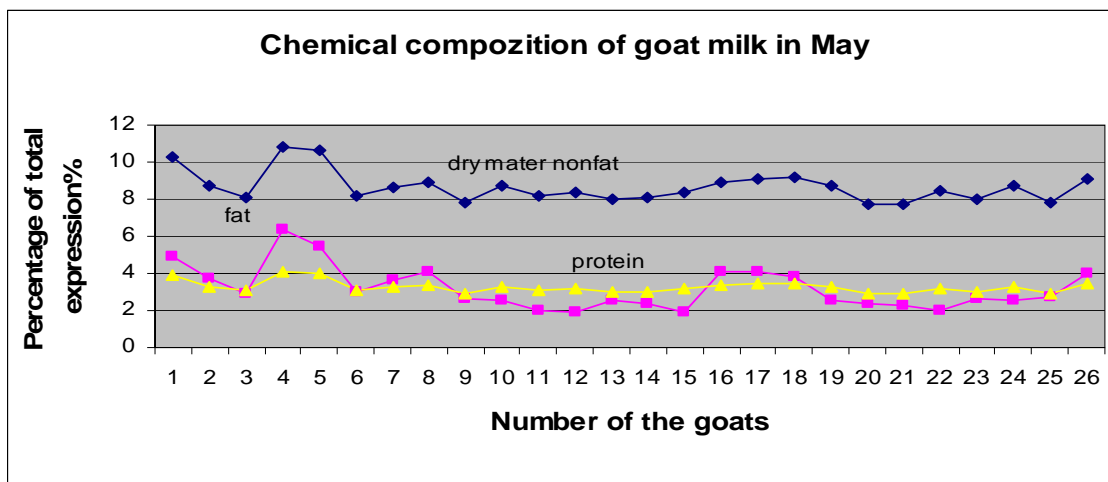


Figure 4. Chemical composition of goat milk in May

*Fibrillar composition*

In goats' case, we can generally speak of two types of fibres, fuzz and hair, with different proportions and dimensions, vary depending on length and finesse, depending by their degree of improvement and the geographic area of exploitation clear in extensive husbandry conditions.

At the studied breed, both groups are graphically expressed, in cm length dimensions are shown in blue string and the finesse are shown in microns ( $\mu$ ) and purple colour. So long fibres of  $8.36 \pm 0.38$  cm and smoothness of  $48.6 \pm 0.32 \mu$  and short and fine fibres  $2.26 \pm 0.26$  cm and  $19.36 \pm 0.28 \mu$ . Comparing with cultural breeds, are much smaller, being a repercussion of intensive selection for milk production, which attract by itself a finer hair.

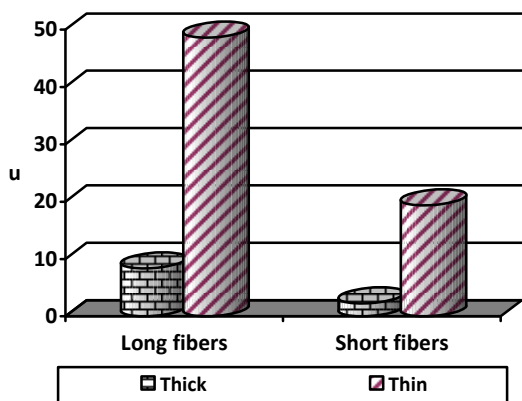


Figure 5. Fibre types of the Saanen goats breed

In other words according to the schedule in fig. 5, one is hair group and group two the fibres fluff of animals. Compared with fibril structure of

Carpathian breed can be seen a decrease in hair fibre structure and a reduction of approx. 25-30% of the values specified above for dimensions [2,5].

**4. Conclusions**

Performing a synthetic analysis of morpho-productive aspects of the Saanen breed from Gârbovi farm, the following aspects can be emphasized:

The female primiparous livestock presents the following morpho-productive traits, such as: weight  $57.37 \pm 0.23$ kg; wither's height  $67.47 \pm 0.38$ cm; cross height  $69.25 \pm 0.41$ cm; oblique body length  $70.98 \pm 0.38$  cm; head length  $21.35 \text{cm} \pm 0.14$ cm; head width  $14.58 \pm 0.18$ cm; chest width  $18.56 \pm 0.15$ cm; croup width  $20.26 \pm 0.14$ cm; thoracic perimeter  $89.17 \pm 0.32$ cm; canon bone perimeter  $9.03 \pm 0.58$ cm, resulting a dolicomorphe body structure. All this body sizes are between characteristics limits of the breed, but have greater variability due to imports realised from more herds. This livestock may be considered as having a fine constitution but which presents some bigger values in comparison with the local Carpathian breed.

The evolution of body weight of young goats achieved from the imported primiparous, have highlighted daily gains between 106 g and 173g, for females young goats 122g respectively 198g, for males, data which don't surpass registered gains of the breed.

Milk production in the analysed population is considered above the potential of local breeds, but the monthly average yields: November 58.05 l, December 70.47 L, January 92.30 L, February

45.10 L, March 86.67 L, April 100.37 L and May 46.42 L, with a total average production at approx. 500.39 L for the entire lactation, are considered poor because in the origin countries the milk production is at least double.

The milk chemical composition, during the lactation of November - May in winter was: non-fat dry matter percentage  $9.3 \pm 0.27$ , protein  $3.50 \pm 0.33$ , fat  $4.027 \pm 0.64$  and density 1.03112.

Regarding fibrillar composition of imported breed, we can say that the structure is different from cultural race by reducing with approx. 25% to 30% of the dimensions of length and finesse, proving that it is a carefully selected population for milk production. Despite of modest, or similar productive results with some local populations, we can say that the performances achieved are under the breed standards, but we are shore that all this problems became from a lack of knowledge in the management of the herd, especially for exploitation of that kind of breeds.

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