

## STUDY ON MURCIANA-GRANADINA GOATS PHENOTYPE. REMARKS ON PRODUCTIVE PERFORMANCES IN AGRI VALAHIA FARM FROM CONTEȘTI, DÂMBOVIȚA COUNTY, ROMANIA

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### Abstract

*Exploitation of specialized goats in Romania is a growing concern among breeders. The explanation can be attributed to the initial intervention on the milk quota and more recently due to the new agricultural policies. Thus, performing animals that are exploited for milk production such as Murcia Granadina breed are imported. This breed is distinguished mainly by the quality of milk, but also by the performance achieved in the environment. The study shows how to adapt the Spanish breed to the type of semi-intensive farm in southern Romania. Specific body measurements were performed, basic indices, prolificacy, and production performances were determined. This was followed up the process of youth growth as well as the quantitative and qualitative performance of milk obtained at Agrivalahia - Conțești farm, Dâmbovița County. The study was carried out within the framework of the CAPRIPLUS project, which aims to achieve qualitative performance for a higher milk. The main body size results show: live weight 45.58±0.73 kg, as an average, withers height 67.02±0.33 cm, the height at the crupper 65.25±0.36 cm, oblique body length 67.25±0.82 cm, head length 22.51±0.12 cm, head width 13.19±0.19 cm, chest width 17.05±0.31 cm, croup width 17.55±0.17 cm, thoracal perimeter 76.89±0.84 cm and cannon bone perimeter 7.84±0.15 cm. These dimensions correspond to a population with a typical dolicomorphic conformation. There are also typical hypo-eumetric dimensions (developed skeleton, high profile, straight upper line, fine head). These data are also confirmed by basic body indices which was determinate. Milk production is only 440.4 ± 0.18 liters for a period of 185 days of average lactation. Daily average milk production is 2.4 liters. However, milk quality gives a much better breed advantage for its average fat of 5.16% and about 2.95% for protein. This type of milk is suitable for the preparation of a certain type of cheese and specialties.*

**Key words:** goat, milk production, quality, body dimensions

### INTRODUCTION

The world goat sheep continues to grow on certain continents such as Asia, Africa, Latin America, main in those areas where goats are considered as "indispensable" species.

In the same areas, the products supplied by its goats are vital to poor families, the goat being the most abundant animal in the countryside. Its biologic features such as adaptability to food, maintenance, or mode of exploitation, as well as its attachment to man, make this species indispensable in people's lives.

The global goat effective has grown over the past 15 years, from 883 million head in 2005 to 1,006 million head in 2014[3].

The main producer remains Asia, which holds over 50% of the world herd. China held 196 million heads in 2005 and 188 million in 2014. In 2014, India held its second position with 133 million heads. On the African continent, in 2005 there were approx. 280 million heads, and in 2014 there were 364 million heads. Over this period on the American continent there were 38 million heads and 36 million heads respectively.

World production of goat as well as cow's milk has declined since 2014. There were major differences between supply and demand due to European policies linked to certain embargoes to the east, China's import reductions as an important global player.

Today, we are witnessing major European dairy demands due to a fall in the number of cows and other lactogens breeds, including goats. [3],[8].

World production of goat milk was 14931 (thousand tones) in 2005 and 17957 (thousands tones) in 2014, of which Asia holds 8270 (thousands of tones) and 10654 (thousands of tones) respectively. Of this, India has almost half, Africa is down by 3520 (thousands of tons) in 2005 to 4185 thousand tons in 2014. The EU 27 had 2590 thousand liters in 2005 and 2526 thousand tones in 2014, declining by approx. -2.47%. [13],[14]

Goat milk contains fatty acids whose level is greatly influenced by the ingestion or diet of animals. [2],[10].

The need to improve the quality of goat milk is a current way of seeing food quality in human consumption. It also addresses the risks to which the metabolism of the animal is exposed in certain disorders. Cardiac disorders are among the most common pathological conditions [15],[17].

Taking into account the concern about the human diet and the need to constantly seek new outlets for the products, special attention is paid to the quality of the raw milk [2][4, 16].

To improve the fatty acid content of milk, we used oilseeds in the goat diet, which have specific characteristics [2],[4],[11].

Romanian farmers are especially concerned about finding new outlets and improving the quality of raw milk.

The present study is part of the analysis of the biological material covered by the CAPRIPLUS project.

The main objective of the project is to obtain a higher quality milk in terms of fatty acid content [1],[2],[14].

## MATERIALS AND METHODS

The biological material subjected to the analyzes was represented by goats from the Murciana-Granadina imported from Spain and breed on the farm in Agri-farm Coțești, Dâmbovița County. The first determinations focused on the prolificacy, the weight of the females, the growth increases and lactation

control, respectively the chemical composition of the milk, determined with the help of the milks scanner and the month variation [17].

Subsequently, body measurements were performed with the help of specific instrumentation and body indexes were determined [11],[12].

For the determination of the quantitative milk production, milking machines were used with debitmetry.

## RESULTS AND DISCUSSIONS

The EU with only 18 million in 2005 and 17 million in 2014 is steadily declining [3].

The European goat herds is presented as follows: Greece is ranked with 4157 (thousands of heads), followed by Spain with 3010 thousand heads and Romania with 1518 (thousands of heads). Our country owns almost 12% of the EU 27 goat herd.[3],[5] (Fig. 1 ).

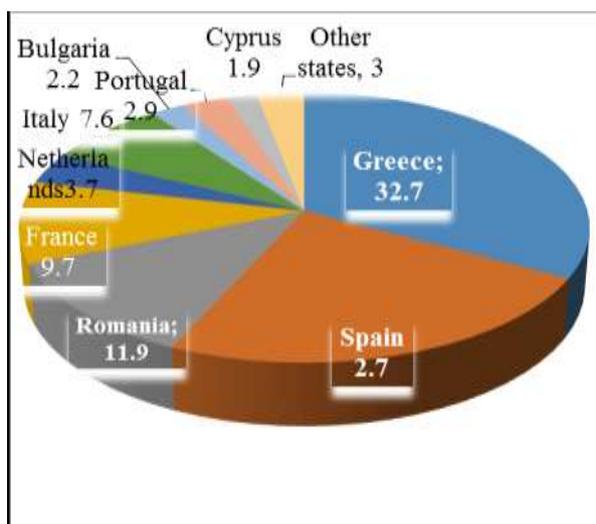


Fig. 1 The herds of goats in the EU 27 - % total heads  
Source: Own design based on the statistic data from Eurostat, 2016 [7, 8].

In Romania there is a tendency to specialize for milk performance. Use of pure breed selection in native breeds based on the conformation of the udder and its suitability for mechanical milking (Fig.2. and 3).

The tendency of autochthonous livestock over the last years analyzed for goat flocks, generally shows a continuous evolution.

The total goat population in Romania registered a decline between 2013 and 2014, followed by an annual increase of approx.

0.5%. The number registered in 2017 (at the end of August) is approx. 3% higher than at the end of 2016 [9] (Fig. 3).

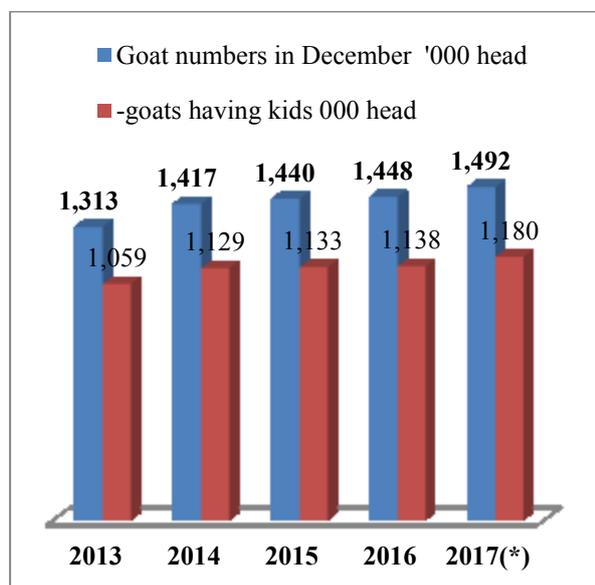


Fig. 2. The herds of goats in the Romania (thousand heads)

\* 2017 = statistical forecast for the last five months

Source: Own design based on the statistic data from MADR, 2017[6]

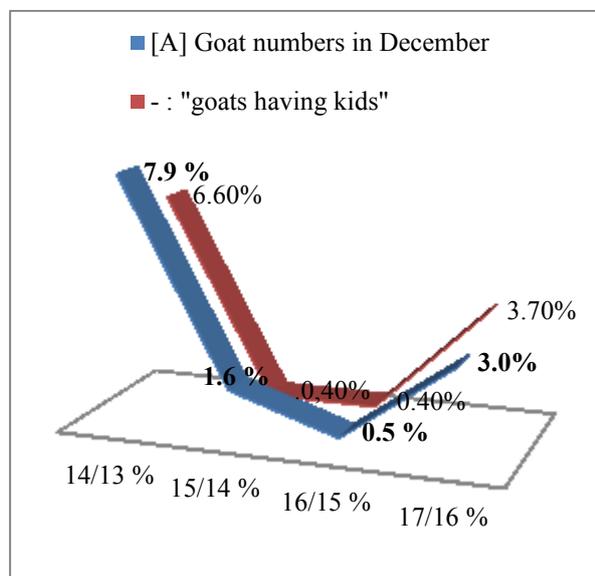


Fig. 3. The annual growth rate of goat flocks in Romania (2014-2017\*)

Source: \* 2017 statistical forecast for the last five months. -own design based on the statistic data from MADR, 2017, [6].

The upward trend in goat herd in Romania is due to farmers' guidance for the exploitation of goats for milk. Farmers have received national subsidies to support livestock breeding. These

subsidies, both for sheep and goat farming, help the economy of small breeders [14],[17].

#### Somatometric measurement

Body measurements carried out on goats in the Murciana breed were performed in order to fit the phenotypically population of goats. The obtained values allowed the determination of corporal indices to confirm the orientation of the population for a particular production.[17] Thus, the following values were obtained by body measurements: the average weight of the goats is  $45.58 \pm 0.73$  with a CV of 12.09%; the width is  $67.02 \pm 0.33$ cm with a 3.69% CV; the height at the crotch is  $65.25 \pm 0.36$  cm; the height at the butt point is  $54.64 \pm 0.44$  cm; the substernal vacuum is  $35.35 \pm 0.22$  cm; the oblique length of the trunk is  $67.25 \pm 0.82$  cm; head length is  $22.51 \pm 0.12$  cm; the head width is  $13.19 \pm 0.19$  cm; the width at the hip is  $17.55 \pm 0.17$  cm; the width at the co-femoral joints is  $18.98 \pm 0.19$  cm; the width at the butt point is  $15.19 \pm 0.34$  cm; the width of the chest is  $17.05 \pm 0.31$  cm; the biaxial width is  $25.53 \pm 0.29$  cm; the perimeter of the chest is  $76.89 \pm 0.84$  cm; the perimeter of the whistle is  $7.84 \pm 0.15$  cm. Measurements of the udder were also performed in females, demonstrating generally a relatively small volume, about 25% smaller than the indigenous races. The udder is very well trapped, with much secretory tissue and good nipple orientation, with no supernumerary and hairless nipples with good kneeling for milking.

Sexual dimorphism is mainly represented by the shape and size of the horns. Male's conformation are 118% higher than in females.

#### Milk production

In the analyzed population, milk production at first lactation reaches an average of 188 liters / head in 140 days of lactation. The quality of milk, reflected by the fat and protein content, is clearly superior to the local breeds. Thus, the protein level of milk reaches 3.05% and that of fat 5.2%. Average production in the following lactations is evolutionary. Thus, good production, ie.  $440.4 \pm 0.18$  liters (with high variability in the population, CV = 15%), was recorded during the 185 days of lactation (compared to the 550 l breed average in 240 days of lactation).

*Chemical milk composition*

The fat content of milk was 5.16%, very close to the breed standard, while the protein content of the milk was only 2.95% compared to 3.6% of the breed standard. We believe this is due to the lack of protein intake in ration. (Fig. 4 and 5).

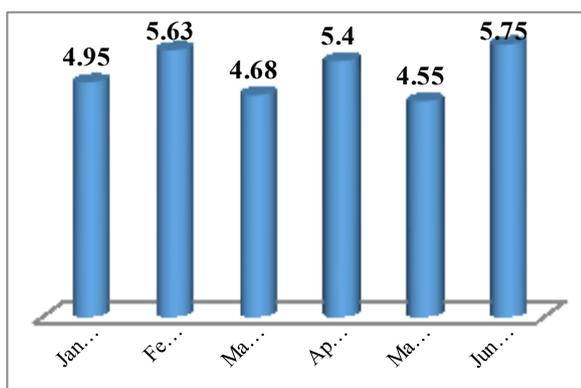


Fig. 4. Variations on the monthly average of milk fat (%)  
Source: Own design based on own determination, 2017

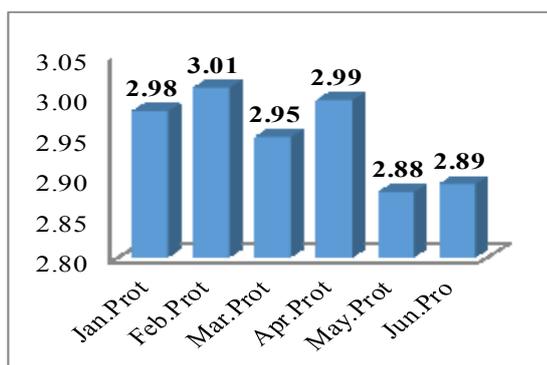


Fig. 5. Variations on the monthly average of milk protein (%)  
Source: Own design based on own determination, 2017

The protein may be considered to be the most important element according to which the selection of goats is primarily aimed at protein intake and casein alpha s-1 especially in specialized goats.

*Growth of young*

Analyzing the stages of the growth process at young goats, different growth rates are observed. These are due to physiological phenomena strictly conditioned by dairy consumption in the first period.

All Spanish technologies provide for a minimum breastfeeding period of approx. 45 days, but also a slower shift to fodder feed.

Farm data reveals that the first step is due to a good increase, with a visible start in the first two months of 114g, respectively 133g /head/day. The daily average gain decreases after weaning at 98g /head/day and remains at this level over the next 4 months. In the last 3-4 months of growth, the average daily increase to 144g /head/day. (Fig. 6).

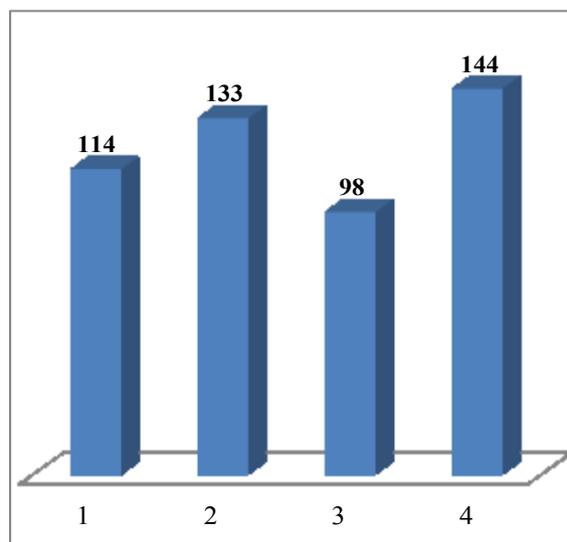


Fig. 6. Evolution of daily average gain in youth up to 9 months, (g/day).  
Source: Own design based on own experiment, 2017

Young female can enter to reproduction at 10-12 months, provided by a very good preparation, based on a protein intake of approx. 15% higher than adults females.

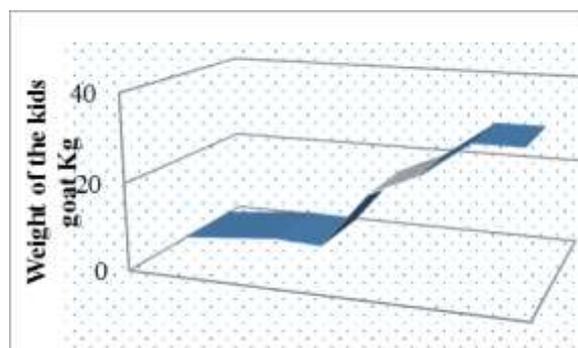


Fig. 7 Stage of growth rates  
Source: Own design based on own determination, 2017

*Females prolificacy*

Analysis of the prolificacy of females in the Murciana population highlights the hyper prolific character of females, the value of this indicator being 168%, compared to the average prolificacy of the breed of 190%.

## CONCLUSIONS

The first conclusions regarding the performances of this breed may be those related to the quality of milk and the yield of cheese maker. Equally, there is a good plasticity of the breed in the context of semi-intensive exploitation.

Typical conformation of Murciana goats' is the dolicomorphic with hipo and eumetric dimensions. Although they have a slightly smaller body size (19.8%) than specialized breeds for milk production, they produce average yields of 440 l /lactation. The milk contains 5.16% fat and 2.95% proteins.

The productive potential of the population can be improved only in the intensive or semi-intensive type of exploitation, with keeping the modern technological requirements.

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