

## STUDY ON THE MORPH-PRODUCTIVE CHARACTERISTICS OF FRENCH ALPINE BREEDS EXPLOITED IN SOUTH-EAST PART OF ROMANIA

Julian VLAD<sup>1</sup>, Marius MAFTEI<sup>1</sup>, Elena POGURSCHI<sup>1</sup>, Mirela CĂRĂTUȘ STANCIU<sup>2</sup>

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Mărăști, District 1, 11464, Bucharest, Romania, Phone: +40213182564, Fax:+40213182888, Mobile: 0723368811, Email: vladiul@yahoo.com

<sup>2</sup>”Lucian Blaga” University of Sibiu, Faculty of Agricultural Sciences, Food Industry and Environmental Protection, 5-7 Ion Ratiu Street, 550003, Sibiu, Romania, Phone: +40269211338, Fax:+40213182888, Mobile:+40744472790, Email: mirela\_stanciu2008@yahoo.com,

**Corresponding author:** vladiul@yahoo.com

### Abstract

*The paper aim was to present a study on how to adapt the French Alpine breed type semi-intensive farms in the South of Romania on: body measurements and basic conformation indices, indices breeding base and production performances related to the growth and the quality and quantity of milk from the farm of Balta Doamnei, Prahova County. Body measurements carried out have revealed the following average dimensions: live weight  $58.41 \pm 0.29$  Kg, as an average, withers height  $69.65 \pm 0.29$  cm., Height at the crupper  $71.46 \pm 0.38$  cm, Oblique body length  $77.60 \pm 0.28$  cm, head length  $20.50 \pm 0.014$  cm, head width  $13.47 \pm 0.18$  cm, chest width  $20.82 \pm 0.25$  cm, croup width  $19.89 \pm 0.14$  cm, thoracical perimeter  $92.21 \text{ cm} \pm 0.32$  cm and cane perimeter  $9.42 \pm 0.053$  cm, conformations corresponding to a typical characteristic of milk with a slight skin dual skeleton developed a strong profile with rectangular top line upward anterior-posterior head fine and confirmed data also found in corporeal indices determined. Milk production is 487.38 litters with a rather large variability between 337 l and 615 l maximum of about 2.3 l / day for an average of 212 days of lactation debut in November with  $56.7 \pm 1, 26$  l, with the slow progress of the lactation curve with a peak in February  $100.41 \pm 3.81$  CV = 1 with a 23.42, followed by a decrease until the 7th month respectively in most  $43.28 \pm 1.52$ , its further performance to be stimulated both by selection on behalf of the mammary gland morphology and sanitation as well as to yield cheese milk protein, respectively.*

**Key words:** production, somatometry, measurement

### INTRODUCTION

In the last twenty years Romanian farmers who wanted exploitation goats were interested more and imported from different European countries a lot of specialized breeds especially for milk, like Saanen, Alpine French, AngloNubian, Murciana-Grandina, and Boer for meat, and even Angora for mohair. The foundations of modern goat growth have been laid.

Obviously some of these breeds were crossed with the native local breeds, whose crossbred did some performance comparable to the maternal and paternal breeds with the requirements of the crossbred of the Carpathians. This breeds are otherwise well adapted to the local geo-climatic extensive

holdings in mixed populations with sheep and goats.

According to FAO statistics goats herd development situation presents somewhat differently, both regarding the number of animals as well as the consumption of milk or goat meat at world and European level [12].

Thus, in the year 2000, the top on goats livestock was owned by Asia with 458.52 million heads followed by Africa with 236.82 millions heads, Oceania with 2.39 million heads, Europe with 18.94 million heads, EU-28 with 14.5 mil heads, America 34.9 million heads from a total world of 751,630,000 heads of goats. In 2013 goats livestock shows somewhat a different situation, 597.15 milion heads in Asia, Africa with 351.97 million heads, Oceania with 3.97 million heads, Europe with 16.48 million heads, EU 28 with

12.41 million heads and America with 36 million heads from a total of 1,005.60 million goats heads [12]. There are certain evolutionary trends only to other continents, except Europe. In Europe and in the EU-28, it shows a major decline of the herds from -12.95% in the first case to 14.46% in the case of EU-28. This decline in goat herds in the European continent continued in the coming years, which is a worrying phenomenon.

In contrast it shows a major increase in other continents such as Africa, approx.+ 48.6%, Asia + 30.23%, Oceania, + 65.76% , America + 3.13% and an evolution of + 33.79% global average in this period (Fig 1).

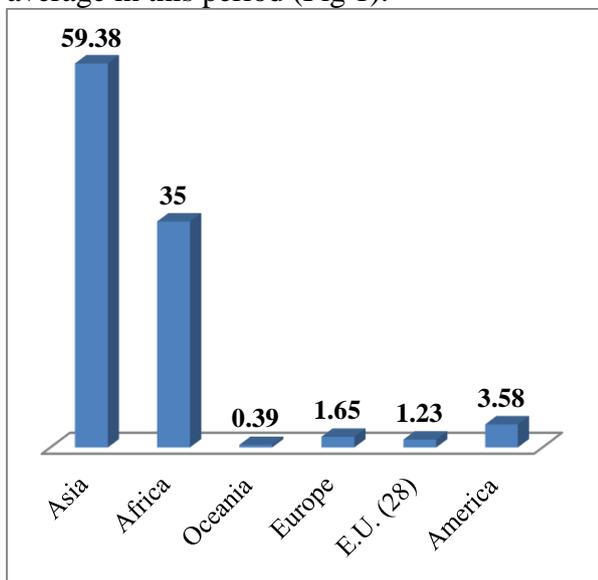


Fig. 1. Contribution rate of goats herds of the world total in 2013 (%) (own design, 2017)

The biggest actual world its goats herds it has Asia with approx. 597,151,616, respectively 59.38% with China in the first place which held in 2011 cca.142.23 million, about 18.9% of world total herds (FAOSTAT) and in 2013 approx. 182.3 million heads, followed by India with 126 million heads goats, Pakistan with 56 million heads, Nigeria with 54 million heads, and Bangladesh with cca. 56 million heads and others. This breed is found where goats provided by adaptive plasticity and less demanding food, minimal protein intake, even vital to human resource poor food, especially in rural areas as Asia and Africa. [12] [13]

At European level, and especially at EU-28 level, between 2000 and 2013, we noticed a decline of approx. 15%. (Fig.2). After

Romania's accession to the EU, Romania ranks 4th place after Greece, Spain and France (Fig. 3). In the last 3 years, we are witnessing the reversal of the last two states, and Romania is ranked 3rd place based on the number of goats in possession (Fig. 3).

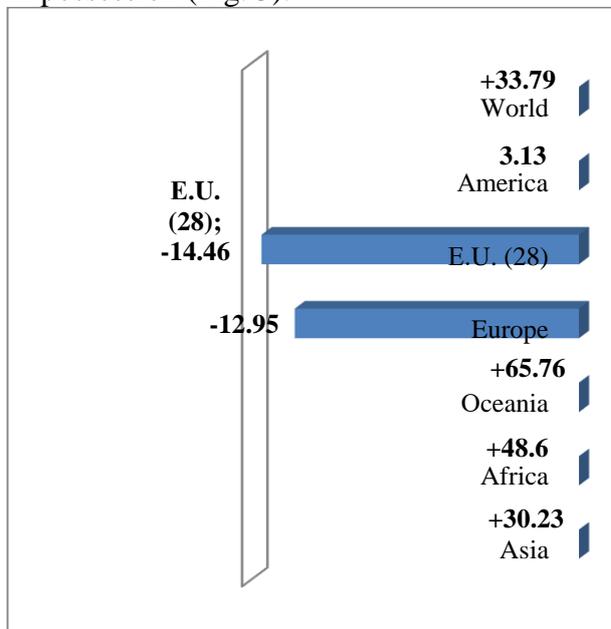


Fig. 2. The descending trend of goats between 2000-2013 (change in %) (own design, 2017)

Starting with 2015, the goat sheep population of the EU28 had a ranking in which Romania passes on 3 place but also with most livestock holdings. The owners have very small households or family farms, where production is for self-consumption.

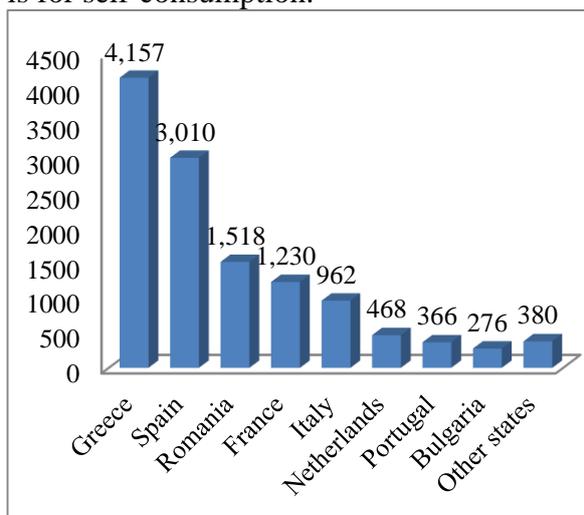


Fig. 3. The evolution of goats in last ten years in first 4 European states, 000 head (own design, 2017)

In Romania according to M.A.D.R. source of December 2016, goats total number was 1.9 million. [11]

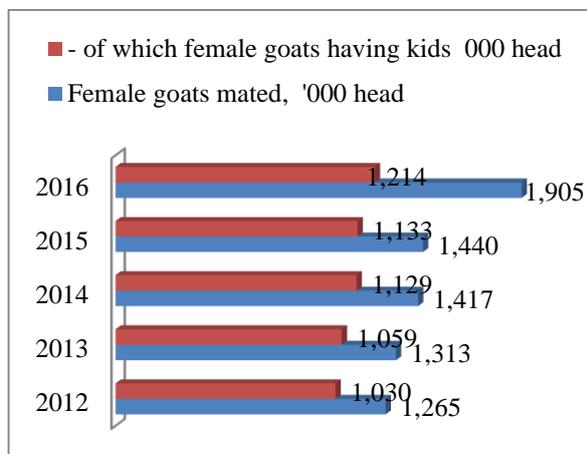


Fig. 4. The evolution of goats herds in last years, 000 head, (own design, 2017)

Global goat milk production has seen an upward trend. Thus, world production in 1990 was 9,980,102 tons and in 2012 it was 17,846,118 tons in which the leader is the Asian continent with 10,410,137 coming mainly from the above mentioned states with a share of about 52% of the world, followed by Africa 22%, Europe 13% and EU 28 10%, America 3% and Oceania 0,04% respectively 48 t (Fig. 5).

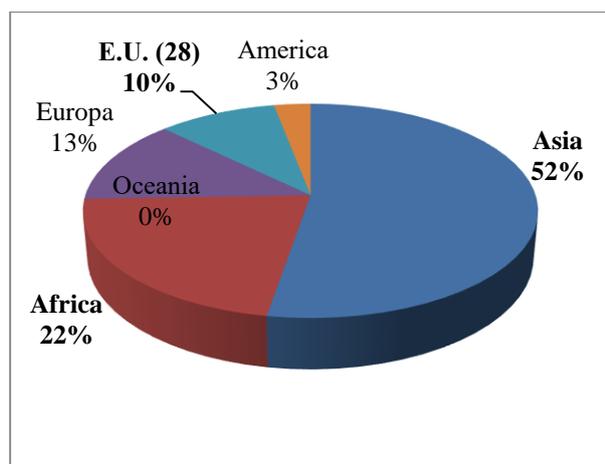


Fig.5. Global contribution of goat milk of total% (Own design, 2017)

Consumption of goat milk as well as meat is usually directed towards continents and developing countries where there is a vital requirement to cover the food of numerous and poor families as a source of protein or in those where top processing or milk preparations

form goats are popularized and/or used for specific cheeses in the EU states, such as France, Spain, Italy, the Netherlands, etc.

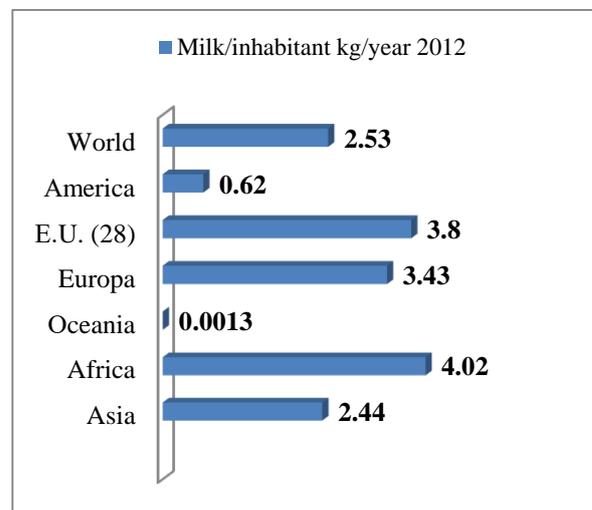


Fig. 6. Goat milk consumption/inhabitant at the world level in 2012 (own design, 2017)

For example, only France produced in 2007 approx. 438,000 t of goat milk collected from approx. 1.3 million heads. In countries such as the Netherlands, Spain, Austria, Italy and Germany, goat breeding has reached other technical and economic parameters, superior to the African situation or perhaps other of European countries.

In Romania, there are mixed holdings farms in which goats are seep are kept together in small or large flocks on the pasture. There are also goat farms, extensively exploited, in over 85% of the goats herd. But there are farms that exploit semi-intensive goats, as is the case with the farmer analyzed. Although they have imported breeds, they can't be considered intensive farms, for other reasons such as holding, feeding and milking. These farms hold over 5-6% of the Romanian herd. Another group is that of farms that exploit specialized breeds and hold farms similar to Western ones. The purpose of the paper was to study how to adapt the French Alpine breed type semi-intensive farms in the South of Romania. In this purpose, there were made investigations on: body measurements and basic conformation indices, indices breeding base and production performances related to the growth and the quality and quantity of milk from the farm of Balta Doamnei, Prahova County.

This study was conducted on Mr Cojocaru Ovidiu's farm on a flock of 68 goats from the French Alpine breed imported in 2010.

## MATERIALS AND METHODS

The biological material subjected to the analyzes was represented by goats from the Alpine breed on the farm in Balta Doamnei Commune, Prahova 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 milk-scanner [1].

Subsequently, body measurements were performed with the help of specific instrumentation and body indexes were determined [5,6]. For the determination of the quantitative milk production, milking machines were used with debitmetry.

## RESULTS AND DISCUSSIONS

Goat determinations reveal a phenotypic peculiarity that allows comparison with specific breed typology, and in particular how high performance breeds can evolve under the effect of climate adaptations. These breeds can only allow in certain situations to obtain off-season milk production compared to the Carpathian, rustic, indigenous breed. [9] A similar inception study was made in 2012 on newly imported biological material on the holding in Gîrbov-Ialomița and was published in 2014, which tried to highlight the adaptive character of the Alpine performance, but subjected to modest exploitation, the results have were similar. [6]

These animals were imported for the purpose of semi-intensive exploitation but also for the sale of male products. They held certificates of origin and were subsequently used for the quantitative and qualitative improvement of milk in the native breed. They were also used to improve the morphological performance of the nipples, namely the milking rate and the ease of mechanical milking in Carpathian breed.[1,4]

In this work, 68 shepherds from the Alpine breed were subjected to zootechnical analyzes, keeping a good structure on the number of lactations.

### *Somatometric measurements*

Body measurements have demonstrated some variability within the same age classes or physiological states, with the following average dimensions: Live weight  $58.41 \pm 0.29$  Kg, Withers height  $69.65 \pm 0.29$ cm, Height at the crupper  $71.46 \pm 0.38$ cm, Oblique body length  $77.60 \pm 0.28$  cm, Head length  $20.50 \pm 0.014$  cm, Head width  $13.47 \pm 0.18$  cm, Chest width  $20.82 \pm 0.25$  cm, Croup width  $19.89 \pm 0.14$  cm, Thoracic perimeter  $92.21$  cm  $\pm 0.32$  cm and Cane perimeter  $9.42 \pm 0.053$  cm. Thus, body indexes are: IFCl = 111%, I.Ma = 118%, I.O.sub.1 = 13.15, ID = 10.0%, I.Dif.Hn = 102% %, I. Pro = 90.2%.

These correspond to a characteristic milk conformation, but with a slight dual tendency, with a developed skeleton, rectangular profile, with an upwardly ascending upper line, having a fine head, with good proportionality. Regarding the body weights that show a certain variability and associated with the determined increases, a very good precocity of the goat youth can be found, limiting the reproductive age of the female youth.

### *Females prolificacy*

The prolificacy of the Alpine females is 139%, although there is a tendency for all female obtained from the twins to be retained to replace the reform group, the tendency was to reduce this percentage, which is also influenced by breeding goats. Inbreeding is considered as a delicate point in both goat and sheep farms.

### *Evolution of the young goats*

The appreciation of the breeding process of the Alpine breed of young goats has allowed some assertions to be made about the precocity of the breed. Thus, it can be noticed that females under one year can be introduced into reproduction because they can reach weights of over 42 kg at approx. 10 months, which represents over 70% of the adult weight of the breed. [6]. Although there are differences in growth rates at different stages of growth, with

gender differences of over 17%, which can also be found in twins.

In the first month of life, the increase to males is 167 g, and to females of 156 g, in close correlation with the weights at birth and the type of calving. In the second stage, where weaning takes place, it is necessary to administer a special zoofort supplement, which allows both post-lactate stress recovery and subsequent recovery. This is the only way to achieve this performance of 196 g at males and 168 g at females and a slight decrease in the 3rd stage with approx. 15-17% of the increase of 0.166 g and 0.156 g of female. Thus, more intense increases in both sexes can be observed in the 2nd stage, with the development of digestive equipment and especially enzymatic, which ensures fast and concentrated feed consumption, as well as earlier ruminant stimulation. This fact was also observed in other farms with performing animals of the same species [5,6]. (Fig. 7.)

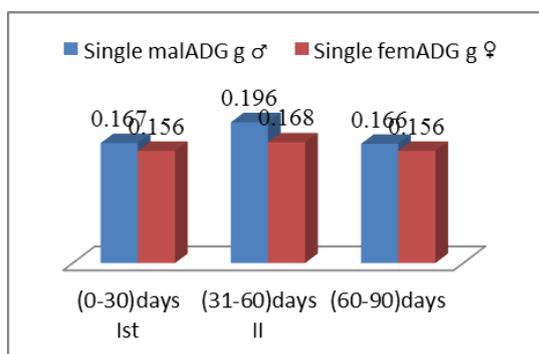


Fig. 7. The evolution of body weight in relation with ages of young goats Alpina (own design, 2017)

### Production of goat milk

Milk is the main production yield under the control of milk production under the coordination of Caprirom. Thus, the average daily milk production is 2.3 l/day but not well above the previous study performance of only 2.19 l/day, for an average lactation period of approx. 212 days. [6] They produced a larger quantity of milk with an average of 487.38 liters, but with a fairly large variability ranging from 337 l to a maximum of 615 l. In this context milk production over a winter- the spring, recognized as an extra season, offers the possibility of its superior net capitalization and thus has another market share, practically

double. This demonstrates good potential but also a lack of selection and orientation especially on breast morphology. Food, comfort, and mechanical milking, conform to physiological requirements, and do not make it difficult to achieve productive performance. In such farms, another type of youth marketing is also envisaged, especially as all products are retained, which can then be better harnessed. This strategy applies to farms that hold imported biological material of origin. [5], [6] The average performance in calendar months shows a modest, slow-onset lactation. Starting November, an average of  $56.7 \pm 1.26$  liters is produced, in December  $68.74 \pm 1.46$  liters with a C.V. 13.12%, in January  $81.92 \pm 1.7$  l liters, in February  $100.41 \pm 3.81$  l with a CV = 23.42, in March  $75.61 \pm 2.07$  liters with a CV = 16.88%, in April  $59.74 \pm 1.65$  l with CV = 17.07%, more  $43.28 \pm 1.52$  l with CV = 21.69%. These productions show some performances, but not enough compared to the average of the breed. Variability quite pronounced, especially in the months with higher productions, shows the need for greater pressure on selection, especially on certain characters. Future genomic selection will be faster and safer. [2]

### Lactation curve

Average performances during lactation show a moderate lactation onset, with a slow progression in the first 3 months of lactation and a peak nearly in the 4th month, with a decrease to 7th month or May, performance further selected and stimulated by any managerial means. The analyzed sample has almost a curve somewhat identical to that of the breed but with a slow decrease, which can be extended to lactation (Fig. 8).

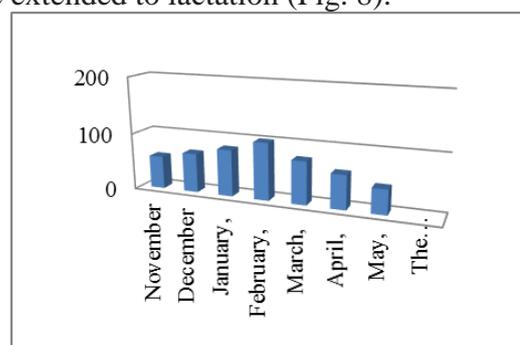


Fig. 8. Variations in the lactation curve of the Alpina French breed (own design, 2017)

*Chemical composition of milk*

The tendency towards a certain variability of the chemical elements of milk has been demonstrated in several papers. Thus the dairy protein variation is good, ranging from 3.2 to 3.6% and the fat between 3.1 and 4.0%, based on a typical diet of stock but also on the rationally concentrated intake. [2] (Fig. 9).

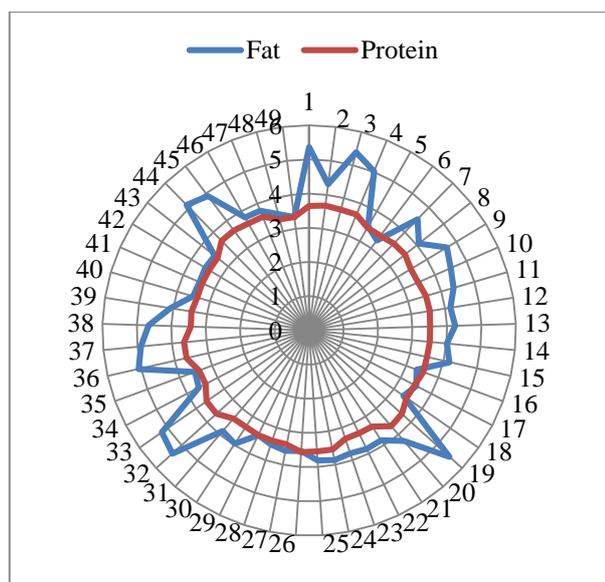


Fig. 9. Variation of fat and protein in milk of Alpina breed (%). (own design, 2017)

The presentation of the monthly averages in the above histogram demonstrates that the selection for milk protein in particular, which has a major influence on the yield of cheese production, can be continued.

The factor analyzed on the holding has good operating conditions. Attention is paid to details of the specific requirement of the breed, age, physiological status, feeding. Also, maintenance and assurance of technical comfort, treatments and/or prevention as appropriate, behavior, supervision, etc. are also considered. all of these are part of the optimal farm management, based on race experience. Processing takes place on the farm, and distribution solutions are sought through short chains, typical of farms that grow productive breeds.

A major role in product valorization and purchase of inputs on the farm can play the associative forms of the species or product. They come to complement both through experience, debates, case studies, impact

studies, or analyzes, and can solve some of the problems encountered. These can be clarified together because new problems arise and there is a great need for specific technical advice with various "actors" on different areas of modern goat exploitation.

From a genetic point of view alongside recognized mammalian morphology indexes, there are a number of combined indexes linked to integrity or health, as well as immunological or combined resistance, as it is called. There are 11 indexes of breast morphology in genetic selection.

Thus, according to the European context, especially the economic and climate context, the need for a detailed study is related to genetic variability, which refers to new characters not only of production, resistance or even parasitology, but also the productive durability or longevity of the new genotype.

**CONCLUSIONS**

Milk production is also considered modest this time, of only 487.38 liters, with a rather large variability of 337 liters, almost as the local rustic breed and the maximum of 615 l, which we can say is close to the ones in country of import. The production of 2.3 l/day for goats and the 212 days of lactation gives us indications that they can be programmed for reproduction.

These extracts and the typology of the lactation curve require a rigorous selection on the basis of both the morphology of the mother and the level of protein and fat, which are also valid for Alpine megacities of the native breed. They seem to have better resistance or plasticity that gives performance on farms in the country.

**ACKNOWLEDGEMENTS**

This work is only part of specialized surveys goats operation of different origin operated mainly in the south, and these analyses could be performed only by agreement and support of Mr. Cojocaru Ovidiu, farmer whom we thank.

## REFERENCES

- [1] Chacon, E., Macedo, F., Velazquez, F., Rezend-Paiva, S., Pineda, E. McManus Concepta, 2011, Morphological measurement and body indices for Cuban Creole goats and their crossbred., Rev.Brasileira Zootecnia
- [2] Doreau, M., Fievez, V., Troegeler-Meynadier, A., Glasser, F., 2012, Metabolisme ruminal et digestion des acides gras longs chez le ruminant. INRA Prod, Anim..., 25(4)361-364.
- [3] Sossidou, E., Lighda, C., Mastranestasis, I., Tsiokos, D., Samartzi, F., 2013, Sheep and goat farming in Greece. Implication and challenges for the sustainable development of less Favoured areas 46(2) Sc Papers Animal Science and Biotechnologies.
- [4] Taftă, V., Rău, V., Neag, S., 1993, A comparative research into the main morpho-productive characteristics of the Carpathian goat of the F1 and F2 Saanen crossed. Works. Science Series D vol XXXV-XXXVI 1992-1993 Animal Bucharest.
- [5] Vlad, I., Călin, I., Răducuță, I., 2006, Research on productive features of a local goat population. A 35 International Scientific Session of livestock. Bucharest.
- [6] Vlad Iulian, Maței Marius, Marmandiu Andrei, Stanciu Mirela, 2009, Research of Carpathian goat breed productive performance in the south-eastern part of the country. Scientific Symposium "Environmental Protection and Food Safety Priorities and Perspectives", ISSN 2067-1989. Tîrgoviște.
- [7] Vlad Iulian, Pîrvuleț Cristina, Maței Marius, Săvoiu Gheorghe, Stanciu Mirela, Gheorghe Gina, 2011, Some Trends and Risks of Pastoral Occupation and Agricultural Consequences for the Romanian Mountain Village – The Results and Conclusions from a Sociological Research in Rucăr Village (Argeș). Scientific papers animal science and biotechnologies, Timișoara, Timișoara.
- [8] Vlad Iulian, Maței Marius, Stanciu Mirela, Săvoiu Gheorghe, Fița Andi, 2012, Partial results regarding exploitation characteristics, morpho-productive traits for Saanen breed goats in South of the country., In Scientific papers, Agricultural Management, series I, vol. XIV(1), XIV(2), XIV(3), XIV(4), Editura Aagroprint, Timisoara, 2012, May International Session of scientific communications of the Faculty of Animal Sciences and Biotechnologies, Timisoara.
- [9] Vlad Iulian, Maței Marius, Ianițki Daniela, Stanciu Mirela, Fița Andi, 2014, Partial result of morpho-productive characteristics of Alpina french goats breed in The South of Romania. Scientific Papers Seria D. Animal Science LVI p. 277-282, Bucharest.
- [10] Zamfir Camelia Zoia, 2003, Increasing milk production from goats of Carpathian breed. Journal of Animal Science and Veterinary Medicine no. 4.
- [11] [www.romstat@insse.ro](http://www.romstat@insse.ro)
- [12] [www.Eurostat](http://www.Eurostat)
- [13] [www.faostat.org](http://www.faostat.org).

