

**EFFECTS OF USING LACAUNE RAMS IN CROSSBREEDING SCHEMES WITH
TURCANA BREED ON BODY DEVELOPMENT IN F₁ LACAUNE X TURCANA
YEARLING EWES – PRELIMINARY RESULTS**

**TARTAREANU MIHAELA^{1,2}, TRICA ANA-GINA^{1,2}, PETROMAN CORNELIA¹,
PETROMAN IOAN¹, SAUER MARIA²**

¹ *Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of
Romania" from Timisoara, Faculty of Agricultural Management, Timisoara, Romania*

² *Research and Development Station for Sheep and Goats, Romanian Academy for Agricultural
and Forestry Sciences, Caransebes, Romania*

email: tartareanumihaela6@gmail.com, gina_trica90@yahoo.com

***Abstract:** Objective of the current research was to evaluate the effects of crossbreeding the French Lacaune breed with Romanian indigenous Turcana sheep on body development in F₁Lacaune x Turcana crossbred nulliparous, reared under extensive and semi-intensive production systems. Under extensive production system, the F₁Lacaune x Turcana gimmers registered an average body weight of 48.2±0.31 kg, compared to the Turcana purebred counterparts, which had on average 45.6±0.24 kg. Differences between the two genotypes were significant statistically (p<0.05). Under semi-intensive production system, the F₁Lacaune x Turcana ewe-lambs registered an average body weight of 36.6±0.19 kg, compared to the Turcana purebred counterparts, which had on average 32.9±0.31 kg. Differences between the two genotypes were significant statistically (p<0.01). Age condition the production of milk so it rises to the fourth lactation, holds in the plate one or two lactation and then decreases progressively.*

Key words: sheep, dairy breeds, Lacaune, crossbreeding, milk production

INTRODUCTION

Sheep are the second most numerous species of grazers, after cattle, with the global number exceeding 1 billion head. With sheep milk production being estimated at 9.272.700 tones/year worldwide, representing 1.3% of the milk produced globally [3].

Sheep production systems vary widely between countries and regions in Europe. In central, eastern and northern Europe, meat became the main product, while in militarily countries milk sheep are predominant. Currently, in the European Union, she is reared 83,971,700 sheep [2], for both meat and milk production, with wool production as a marginal product. Majority of sheep and goat flocks in eastern and southern Europe are grown in marshland areas in less-favored areas, as defined in Directive 75/268 / EEC, the social and ecological role contributes to the preservation of the environment with an economic importance.

Ewe milk production varies greatly between sheep breeds, mainly because of the different feeding management of flocks and of the genetic improvement schemes practiced. Furthermore, considerable phenotypical variation for milk yields exists among most dairy breeds. Some breeds, due to selection and proper nutrition, may be able to produce yields higher than 600 kg of milk/lactation, taking into account the heritability for milk yield, that ranges between 0.20-0.30, with individuals that produced under experimental conditions over 1.400 kg of milk/lactation [4].

The Lacaune is the most important sheep dairy breed from France, with a census of over 800.000 breeding ewes in the country. Milk production of the Lacaune breed increased from 80 to 270 kg in roughly 30 years [1]. The Lacaune is a large-framed breed, with adult ewes weights of 70-75 kg, and males around 90-100 kg. Multiparous Lacaune ewes have an average prolificacy of 170 to 180 %, with a long breeding season. And an

average prolificacy of 140 % in primiparous females, when put to ram as ewe-lambs at the age of 7 to 8 months [7, 10].

In Turcana breed, selection, geographic conditions, and large numbers of animals resulted in a high phenotypic heterogeneity of body weight in adult sheep of 30-60 kg and in rams of 50-120 kg, lambs from 110 pounds to 275 g / day and prolificacy rates ranging between 103 and 140% [5].Milk production is generally low, with ewes producing yields of 40 to 60 kg of milked milk, after weaning the lambs [7].

Effect assessment was the objective of the research effects of crossbreeding the French Lacaune breed with Romanian indigenous Turcana sheep on body development in F₁Lacaune x Turcana crossbred nulliparous, reared under extensive and semi-intensive production systems.

MATERIALS AND METHODS

The study was carried out at the Research and Development Station for Sheep and Goats from Caransebes (45°25'N/22°13'E), south-western Romania, starting September 2015 until October 2017. Caransebes region has an elevation of 280 m above sea level and a total annual precipitation of 737.2 mm, with a mean annual temperature of 12.9°C.

Two groups experimental groups were set-up for the study as follows: experimental group I, with the production of the crossbred lambs and their rearing under extensive (traditional system), with no access to concentrates feed and the admission to reproduction at the age of 18 months of the nulliparous; experimental group II, with the production of the crossbred lambs and their rearing under semi-intensive conditions, with access to concentrates feed and the admission to reproduction at the age of 8 to 10 months of the nulliparous females.

Table 1.

General data of the experimental design and rearing conditions in intensive and semi-intensive production systems

Trait/ Production system	Extensive	Semi-intensive
Age at first mating	18 months	8-10 months
Reproduction onset	September	October
Concentrates during grazing	no	200 g/day
Concentrates during whinter	no	300 g/day
Pasture type	Natural, unimproved	Cultivated
Stoking rate	10-12 heads/ha	7-9 heads/ha
Indoors housing in whinter	60 days	90 days

Two genotypes were used in the implementation of the research, as follows F₁Lacaune x Turcana females and the control groups, consisting of nulliparous Turcana gimmers. Both groups were kept under identical feeding and housing conditions, being kept and managed in the same flock, under semi-intensive production system (see Table 1), each of the experimental groups consisted out of 25 animals.

In mid-September the reproduction season began, the animals had a strong feed base and during the year they had access to abundant drinking water and mineral blocks.

For 120 days during the winter, the sheep were housed on straw beds with a surface area of 1.8 m² / sheep. Sheep have been harvested and maintained on high quality pastures with the addition of 200 g of late gestation concentration and during the lactation period (65 ± 5 days). After weaning the lambs, ewes were managed exclusively on pastures, with two milking's per day (starting 6:00 and 17:00).

Differences between groups were analyzed by a non-parametric test, the data being statistically used with the MiniTab14® software.

The research activities were performed in accordance with the European Union's Directive for animal experimentation (Directive 2010 63/EU).

RESEARCH RESULTS

Data on the effects of crossbreeding the Lacaune sires with indigenous Romanian Turcana ewes on the body development in crossbred nulliparous are being presented in Table 2, based on the production system applied.

Under extensive production system, with the admission of the nulliparous at the age of 18 months, the traditional system practiced in Romania, the F₁Lacaune x Turcanagimmers registered an average body weight of 48.2±0.31 kg, compared to the Turcana purebred counterparts (control group), which had on average 45.6±0.24 kg at the same age. Differences between the two genotypes were significant statistically ($p < 0.05$).

Both genotypes had body weights higher than the threshold set for Romanian indigenous breeds to be put to ram, respectively 35-40 kg [6, 7]. Although, differences were in favor of the dairy specialized genotype (Lacaune sired females), taking into consideration that the crossbred was produced in order to be reared for milk production.

In the future, both genotypes will be further reared under experimental conditions (station conditions) in order to test the reproduction efficiency and their potential to produce sheep milk.

Table 2.
Means (±SE) on body development of nulliparous F₁Lacaune x Turcana and Turcana purebreds reared in extensive and semi-intensive systems (in kg)

Genotype	Extensive system (18 months)	Semi-intensive system (8-10 months)
F ₁ Lacaune x Turcana	48.2±0.31	36.6±0.19
Turcana (control group)	45.6±0.24	32.9±0.31
Statistical differences	*	**

P: NS > 0.05; * < 0.05; ** < 0.01; *** < 0.001

Under semi-intensive production system, with the admission of the nulliparous at the age of 8 to 10 months, the F₁Lacaune x Turcana ewe-lambs registered an average body weight of 36.6±0.19 kg, compared to the Turcana purebred counterparts (control group), which had on average 32.9±0.31 kg at the same age and reared under identical feeding conditions. Differences between the two genotypes were significant statistically ($p < 0.01$).

Current results are in accordance with previous reports concerning the body development of the replacement ewes in the Romanian indigenous sheep breeds [6, 7, 8].

CONCLUSIONS

Current results show that by using Lacaune rams for crossbreeding with the less improved and indigenous Turcana breed, the progeny will have a significantly higher body development, and thus, the farm returns could be much improved in sheep enterprises that practice the extensive and semi-intensive farming systems, throughout the introduction to reproduction with one year earlier compared to the traditional system of 18 months.

Thus, such results should be advertised to both farmers and the breeder's associations, in order for the sheep farmers to take advantage of the breed complementarity found between the specialized Lacaune and the native Turcana.

ACKNOWLEDGEMENTS

This work was supported by a grant of the Romanian Ministry of Agriculture and Rural Development, project code PS-ADER 5.1.8.

REFERENCES

- [1]. **AVRAMESCU DANIELA, BODNAR K., PETROMAN I., PETROMAN C., BENK A., MARIN D., BĂLAN I.**, Relationsheep between age of sheep and quantity of milk.
- [2]. **BARILLET F., MARIE C., JAQUIN M., LAGRIFFOUL G., ASTRUC J.M.**,2000, The French Lacaune dairy sheep breed: use in France and abroad in the last 40 years., 51st Annual meeting of the EAAP, The Hague, The Netherlands, pp. 286
- [3]. **EUROSTAT**, 2014. Reports for 2013: <http://ec.europa.eu/eurostat>
- [4]. **FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS(FAO)**, 2011, Reports for 2009: <http://faostat.fao.org/>
- [5]. **GAVOJDIAN D.**, 2014, Principles of Dairy Sheep Production, Licium-Art Kft. Debrecen, Hungary, pp. 29-47
- [6]. **GEORGESCU G., BANU C., CROITORU C., SAVU C., TAFTA V., VAN I., LUNGU S., MOVILEANU G.**, 2000, Tratat de producerea, procesarea si valorificarea carnii, Ceres, Bucharest, Romania, pp. 110-112
- [7]. **ILISIU ELENA, DARABAN S., GABI-NEACSU M., ILISIU V.C., RAHMANN G.**, 2010, Improvement of lamb production in Romania by crossbreeding of local Tsigai breed with high performance breeds, Applied Agriculture and Forestry Research, 4(60), 259-266
- [8]. **PADEANU I.**, 2010, Productia de carne la ovine, Mirton, Timisoara, Romania, pp. 12-43
- [9]. **SAUER W.I., GAVOJDIAN D., VOIA S.O., SAUER MARIA, ALBULESCU MIHAELA, TRICA ANA-GINA, DRAGOMIR CARMEN, PADEANU I.**, 2016, Effects of Crossbreeding Lacaune with TurcanaBreed on Milk Production Traits, Scientific Papers: Animal Science and Biotechnologies, 49(2), 186-189
- [10]. **SOSSIDOU EVANGELIA, LIGDA CHRISTINA, MASTRANESTASIS I., TSIOKOS D., SAMARTZI F.**, 2013, Sheep and Goat Farming in Greece: Implications and Challenges for the Sustainable Development of Less Favoured Areas, Scientific Papers Animal Science and Biotechnologies, 46(2), 446-449
- [11]. **TRICA ANA GINA, PETROMAN IOAN, IASMINA IOSIM, CORNELIA PETROMAN, ADRIAN FIRU, DIANA MARIN**, 2017, Proposal for some improvement measures of obtaining meats management at ovine species