

Study on the Effects of Crossbreeding the Turcana Ewes with Lacaune Rams and Performance of F₁ Lacaune x Turcana throughout First Lactation

Maria Sauer¹, Walter Ioan Sauer¹, Raducu Radu², Dinu Gavojdian¹, Ioan Padeanu³, Sorin Voia³, Doru Ratiu¹

¹ Sheep and Goats Research-Development Station Caransebes, Drumul Resitei, km 2, postal code 325400, Caras-Severin county, Romania

² Institute for Research and Development in Sheep and Goats Palas, I.C. Bratianu, no248, postal code 900316, Constanta county, Romania

³ Faculty of Animal Sciences and Biotechnologies, USAMVB Timisoara, Calea Aradului, no119, postal code 300645, Timis county, Romania

Abstract

This paper aimed to compare the milk yield of pure breed Turcana ewes and crossbreed F₁ Lacaune x Turcana ewes during their first lactation. Growth performance of F₁ Lacaune x Turcana crossbreed lambs and of purebred Turcana lambs was registered, in both male and female lambs. Results shown the fact that, in 3 months of age male lambs, were registered an average body weight of 22.47 kg in pure Turcana breed, and of 23.46 kg in F₁ crossbreed lambs. In female lambs, during their first 90 days, the average body weight was of 20.66 kg in purebred Turcana and of 21.41 kg in F₁ Lacaune x Turcana crossbreeds. During first lactation, milk yield of F₁ Lacaune x Turcana ewes was on average of 152.74 liters, compared with first lactating Turcana ewes, which produced an average of 116.80 liters. Differences registered between the two populations was of 35.94 liters (p<0.001). Both growth rate and milk yield are improved in indigenous Turcana sheep breed through utilization of Lacaune rams.

Keywords: Lacaune rams, sheep milk, Turcana breed

1. Introduction

Native Romanian Turcana sheep breed represents 53% of the sheep population in Romania [1].

In the western part of the country, represents over 90% of the sheep reared, thus an improvement of both milk yield and growth rates are very important.

Considering that the Turcana breed is well adapted and a very hardy type of animal, but has a lower production level in both milk and meat, improving the breed throughout specialized breeds could be taken into account.

On average, a multiparous Turcana ewe yields around 150±50 liters and a primiparous ewe produce on average 100±40 liters of milk [2], in a 200-240 days interval.

The French Lacaune breed, which produces on average 250-270 liters/lactation, could be an appropriate crossing sire for our native breeds, also due to the fact that the udders of the ewes, have better aptitudes for mechanical milking [3].

Growth rates are also low in romanian coarse wooll breeds, and in Turcana lambs the average daily gain is around 160-180 grams per day. Aim of this paper was to study the growth rates in F₁ crossbreed lambs Lacaune x Turcana from birth to 3 and 8 months, and to register milk yield during first lactation.

* Corresponding author: Dinu Gavojdian, 0040-723375804, gavojdian_dinu@animalsci-tm.ro

2. Materials and methods

The study was carried out in the Sheep and Goats Research-Development Station Caransebes, for a period of 3 years.

At the beginning of the experiment, two Lacaune rams have been bought and mated to purebred Turcana ewes.

F₁Lacaune x Turcana crossbred lambs as well as purebred Turcana lambs were then tested for growth rates (at 3 and 8 months), and crossbred ewes (n=23) were mated at 1.6 years with Turcana rams, and their performance was registered, as well as the performance of primiparous Turcana gimmers (control group, n=20).

All lambs were weaned at the age of 60 days, and received daily 250 g concentrates starting the second week of life, until the group were weighing around 30 kg, after that they were fed only fresh pasture feed, throughout grazing.

Weighings of the lambs were made during morning time, at the same hour each time, using an electronically scale which had a precision of 0.05 kg.

Milk yield was registered using the method of the Official Control of Performances according to the ANARZ rules, with demand at least 4 days of control during lactation, in both milking times/day.

Mann Whitney test was used for testing the differences between the experimental groups.

3. Results and discussion

Results regarding body weight of the lambs included in our study are presented in Table 1. Body weight in F₁ male lambs at the age of 60 days was on average 23.46 kg, with values ranging between 21.23 and 25.52 kg. An average with 0.99 kg higher compared with pure breed Turcana male lambs, which are registering an average of 22.47 kg, the difference was tested as statistically significant (p<0.05).

In female lambs on the other hand, averages registered were of 21.41 kg in F₁ female lambs at 60 days, and of 20.66 kg in purebred Turcana ewe lambs, the difference registered of 0.75 kg was statistically insignificant.

F₁ males Lacaune x Turcana registered a average body weight of 41.03 kg at the age of 240 days, with limits ranging between 38.78 and 42.99 kg. While the purebred Turcana lambs were

registered to have on average 37.21 kg, with limits between 34.95 and 39.85 kg.

Differences between the two groups were on average of 3.82 kg, differences very significant statistically (p<0.001).

In female F₁ lambs the average body weight was of 36.63 kg, with limits ranging from 34.54 kg to 38.48 kg.

In Turcana control group averages were of 32.94 kg, with limits ranging between 30.80 and 35.60 kg.

Differences between the ewe lambs were on average of 3.69 kg, differences very significant statistically (p<0.001).

Lacaune breed seems to improve significantly the growth rates in Turcana breed, but not during the first 2-3 months of life.

An higher weight of the lambs can be observed at the age of 8 months, in both males and females (3.82***, respectively 3.69***), compared with pure Turcana lambs of the same age.

As shown in table 2, milk production of both F₁Lacaune x Turcana and purebred Turcana primiparous had an average milk yield during first lactation of 152.74 l, with limits ranging between 122 and 181 liters of milk in F₁ crossbred gimmers.

And the average milk yield of Turcana primiparous ewes was registered at 116.80 l, with limits ranging between 89 and 150 l.

It has to be mentioned that the total milk yield of the ewes included in our study was calculated by summing the milk consumed by lambs and the actually milked milk.

Differences between the two groups of primiparous were on average of 35.94 l, value which is very significant statistically.

The actually milk production (- first 60 days production), was on average of 94.48 l in F₁ Lacaune x Turcana ewes, with limits ranging between 82 and 107 l (p<0.001). And of 69.15 in purebred Turcana, with limits ranging between 51 and 78 l.

Differences among the two groups were very significant statistically (p<0.001).

Looking at the data from table 2, it can be noticed that the aptitudes for milk production of the Lacaune breed are improving significantly the milk yield of Romanian native Turcana breed during first lactation. This could be used by breeders to improve their incomes if they are choosing to have higher milk production in their

flocks, as a rapid method insted of selecting the purebreed Turcana for milk yield, witch may take more than 4 or five generation and a more improved feeding strategy to obtain the same effect on the milk production.

Using the multiplicative factor to adjust milk yield to a mature equivalent 1.24, as described by Berger et al [4], the F₁ Lacaune x Turcana would produce at the age of 4 to 7 years around 189.39 l of milk, while the Turcana ewes will produce an average of 144.83 l of milk.

Table 1. Body weight of F₁ Lacaune x Turcana and Turcana male and female lambs at 3 and 8 months (kg)

Trait	X±S _x	SD	cv (%)	Min	Max
F ₁ male lambs weight at 60 days	23.46±0.27	1.23	5.24	21.23	25.52
F ₁ female lambs weight at 60 days	21.41±0.25	1.20	5.64	19.78	23.51
Turcana male lambs weight at 60 days	22.47±0.34	1.66	7.40	19.90	25.20
Turcana female lambs weight at 60 days	20.66±0.29	1.43	6.95	18.45	23.05
F ₁ male lambs weight at 240 days	41.03±0.31	1.48	3.61	38.78	42.99
F ₁ female lambs weight at 240 days	36.63±0.19	0.95	2.61	34.54	38.48
Turcana male lambs weight at 240 days	37.21±0.36	1.64	4.42	34.95	39.85
Turcana female lambs weight at 240 days	32.94±0.31	1.42	4.32	30.80	35.60
F ₁ versus Turcana male lambs at 60 days			0.99 kg *		
F ₁ versus Turcana female lambs at 60 days			0.75 kg ^{ns}		
F ₁ versus Turcana male lambs at 240 days			3.82 kg ***		
F ₁ versus Turcana female lambs at 240 days			3.69 kg ***		

Table 2. Milk yield of F₁ Lacaune x Turcana and Turcana ewes during first lactation (l)

Trait	X±S _x	SD	cv (%)	Min	Max
Total milk yield in F ₁ Lacaune x Turcana ewes	152.74±3.26	15.62	10.23	122.00	181.00
Total milk yield in Turcana ewes	116.80±3.75	16.77	14.36	89.00	152.00
Milked milk in F ₁ Lacaune x Turcana ewes	94.48±1.40	6.71	7.11	82.00	107.00
Milked milk in Turcana ewes	69.15±1.56	6.98	10.10	51.00	78.00
Diferences in total milk yield			35.94 ***		
Diferences in milked milk			25.33 ***		

4. Conclusions

Lacaune breed seems to improve significantly the growth rates in Turcana breed, but not during the first 2-3 mounths of life. A higher weight of the lambs can be observed at the age of 8 mounths, in both males and females crossbreeds, compared to pure Turcana lambs.

During first lactation, milk yield of F₁ Lacaune x Turcana ewes was on average of 152.74 liters, compared with first lactating Turcana ewes, witch produced an average of 116.80 liters. Differences registered between the two populations were of 35.94 liters (p<0.001).

Using the multiplicative factor to adjust milk yield to a mature equivalent (1.24, as described by Berger et al), the F₁ Lacaune x Turcana would produce at the age of 4 to 7 years around 189.39 l of milk, while the Turcana ewes will produce an average of 144.83 l of milk.

Lacaune breed is improving significantly the milk yield of romanian native Turcana breed during first lactation. This could be used by breeders to improve their incomes if they are chousing to have higher milk production in theyr flocks, as a rapid method insted of selecting the purebreed Turcana for milk yield.

Acknowledgements

This work was supported by grant no PS 416, financed by Ministry for Agriculture and Rural Development. The authours would like to also thank the entire research team from the Sheep and Goats Research-Development Station from Caransebes who participated at the development of the present research, and without whom the work would have been impossible.

References

1. Agentia Nationala pentru Ameliorare si Reproductie in Zootehnie G. K. Constantinescu Bucuresti, 2009, <http://www.anarz.eu/AnarzAdministratorSite/cmscontent/raport>,
2. Voia, S., *Ovine si Caprine, Ghid practic de crestre*, Ed. Waldpress, Timisoara, 2005, pp 68-70
3. Padeanu, I., et al., *Researches Regarding Growth Speed in Crossbreeds Lambs Lacaune x Spanca Reared in the Westen Area of Romania*, *Animal Science and Biotechnologies Timisoara*, 2010, 43 (2), 317-319
4. Berger, Y., Billon, P., Bocquler, F., *Principles of sheep dairying in North America*, University of Wisconsin Cooperative Extension Publishing, 2004, pp 21-34