

Comparative Study Regarding Body Development in Turcana and F₁ German Blackheaded x Turcana Yearling Ewes

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Abstract

Researches were carried out in a commercial sheep farm from Arad County, situated in western Romania. Yearling ewes, with their age ranging from 12 to 13 months were included in the trial. Two genotypes were considered, purebred indigenous Turcana (TA, n = 18) and F₁ German Blackheaded x Turcana (GBT, n = 33) crossbreeds. The aim of the current study was to evaluate the effects that crossbreeding local Turcana sheep with the meat specialized German Blackheaded breed have on the body development of yearling ewes and their wool production traits. Results have shown that the GBT crossbreed gimmers had a significantly ($p \leq 0.001$) higher body weight, of 53.8 kg when compared with the TA purebreds, which had on average 45.0 kg. Wool production was significantly higher ($p \leq 0.001$) in TA yearling ewes when compared to their counterparts, while the length of the wool-staple was not influenced by genotype related factors ($p > 0.05$). Results of the current study outlined that the GBT yearling ewes are more precocious when body weight is concerned, and this could lead to their introduction to reproduction starting with 12 months of age.

Keywords: crossbreeding, German Blackheaded, meat production, sheep, Turcana, wool traits.

1. Introduction

With a national flock of 10 million sheep, Romania has among the biggest sheep industries within the E.U. member states, with the numbers of sheep growing on a yearly basis with 5 to 7% [1]. Out of the EU member states, Romania exports the highest quantity of sheep meat,

estimated at an annual rate of 50-60 thousand tonnes/year [1].

The highest price for lamb meat is registered for light carcass lambs, which are born during autumn and then marketed before the Christmas celebrations, seconded by the light lambs sold right before the Easter celebrations.

In Romania, regardless by the markets opportunities for better farm returns, only 3 to 5% of the lamb production is sold right before the winter celebrations [2].

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The Turcana sheep is the most widely dispersed throughout the country from all indigenous Romanian sheep breeds, is well adapted to local feeding and rearing conditions, is the most representative breed, representing about 70% of the sheep reared in the country.

Turcana breed ewes are strongly seasonal, with the highest incidence of ewes manifesting oestrus in mid autumn, while a small fraction of the ewes (10-20%) are manifesting oestrus during the out of season breeding [2].

The Tsigai breed represents roughly 25% of the breed structure, being located mainly in Moldova and South-Eastern Transylvania. Being a seasonal breed as well, however, about 40 to 50% of the ewes go into oestrus during out of season breeding, especially in mid spring.

The two native Merino strains (Palas and Transylvanian) manifest oestrous during spring in significantly higher proportions, of 70 to 90%, however, these breeds represent only 3 to 4% of the sheep reared in Romania [3].

Meat specialized breeds have a typical out of the season reproduction onset, with a lower frequency during summer months, usually between July and August [4]. Once with Romania joining the EU, the possibility of importing such breeds emerged.

Currently, crossbreedings between local breeds and meat specialized breeds are being practiced by a growing number of Romanian sheep farmers.

Several studies have demonstrated that commercial results are significantly influenced by the maternal and sire breeds complementary [5-12].

Farmers show interest in keeping for breeding purposes as replacements the crossbred ewes. The hypothesis of the farmers is that the crossbred ewes register higher growth rates compared to the Turcana purebreds, achieving therefore a proper mating weight at one year of age, and the dual-breeds will be out of season breeders [13, 14].

The aim of the current study was to evaluate the effects that crossbreeding local Turcana sheep with the meat specialized German Blackheaded breed have on the body development of yearling ewes and their wool production traits.

2. Materials and methods

Researches were carried out in a commercial sheep farm from Arad County, situated in western

Romania, in 2014. Yearling ewes, with their age ranging from 12 to 13 months were included in the trial. Two genotypes were considered, purebred indigenous Turcana (TA, n = 18) and F₁ German Blackheaded x Turcana (GBT, n = 33) crossbreeds.

Yearling ewes were naturally suckled and creep fed (high quality hay and 16% CP concentrates) starting the age of two weeks, until weaning (2.5 months). Following weaning, animals were managed exclusively on natural pastures.

During shearing (27 of March), traits such as body weight, fleece yield and wool staple length were recorded.

Based on those primary data, averages and dispersion indices were computed, alongside with the testing of differences by applying the non-parametric Mann Whitney test.

3. Results and discussion

Body weight alongside to the oestrus onset is an essential trait for introducing yearling ewes to reproduction in an early age (10-12 month of age) [4].

Generally is accepted that ewe lambs could manifest oestrus as soon as 6 to 7 months of age, and for Romanian indigenous breeds the minimum body weight before joining should be of 40 to 45 kg, in order for the adult body development and milk traits not to be negatively affected.

Average body weight of Turcana and the F₁ crossbred yearling ewes at shearing are being presented in Table 1.

Data from Table 1 shows that Turcana purebreds had an average body weights of 45.0 kg, higher than previous estimates for the breed, which is regarded as an un-improved late maturing breed, with the overall variability among individuals being low (VC% = 8.22%).

Managed under identical rearing and feeding conditions, body weight of the F₁ crossbred yearling ewes were higher by 8.77 kg, with an average body weight of 53.82 kg. As expected, with a higher variability among individuals, of 10.18%.

Overall, the difference between the two genotypes was of 19.5% (8.77 kg), with the German Blackheaded sired yearlings being significant heavier ($p \leq 0.001$).

According to data published by the Institute for Research and Development for Sheep and Goats Breeding from Palas - Constanta, it's being recommended for the nuliparous ewes to be joined at the minimum body weight of 38-40 kg.

Results of the current trial suggest that the yearling ewes at the age of 12 and 13 months had registered a higher body development compared to this threshold, and thus they could be joined sooner with 6 months, compared with the typical age for the Turcana, which is at 18 months.

Current results are in accordance with those published in other reports concerning the

crossbreeding of local indigenous Romanian breeds with meat specialized sires [5, 6, 11].

Average fleece production in Turcana yearlings was on average 3.94 kg, significantly higher ($p \leq 0.001$) by 0.5 kg, compared to the crossbred females, which attained on average 3.44 kg.

It was observed that the crossbred yearling ewes had cleaner wool, with a more intense gloss, better quality fibres and undulations, characters more close to the wool of the German Blackheaded (Table 2).

Table 1. Averages and dispersion indices for the body weights of the Turcana and crossbred yearling ewes

Genotype	n	$\bar{x} \pm \text{SEM}$	SD	VC (%)
Turcana [A]	18	45.0 ± 0.87	3.70	8.22
F ₁ crossbreds [B]	33	53.82 ± 0.95	5.48	10.18
Differences:	A vs. B	- 8.77 kg (19.5%) ***		

Table 2. Averages and dispersion indices for the sheard wool production for the Turcana and crossbred ewes

Genotype	n	$\bar{x} \pm \text{SEM}$	SD	VC%
Turcana [A]	18	3.94 ± 0.12	0.51	12.93
F ₁ crossbreds [B]	33	3.44 ± 0.12	0.68	19.77
Differences:	A vs. B	+ 0.50 (12.69 %)***		

Table 3. Averages and dispersion indices for the wool staple length for the Turcana and crossbred ewes

Genotype	n	$\bar{x} \pm \text{SEM}$	SD	VC %
Turcana [A]	18	30.89 ± 0.56	2.37	9.17
F ₁ crossbreds [B]	33	31.45 ± 0.39	2.24	11.92
Differences:	A vs. B	- 0.56 (1.8 %) NS		

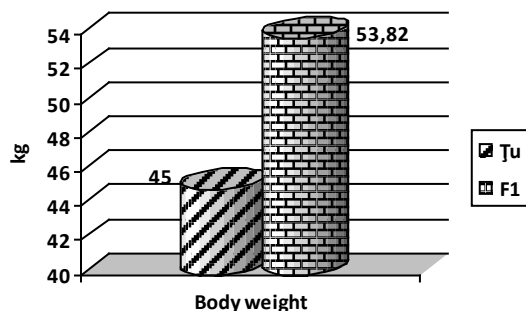


Figure 1. Graphical representation of the body weights between Turcana and F₁ crossbred yearling ewes

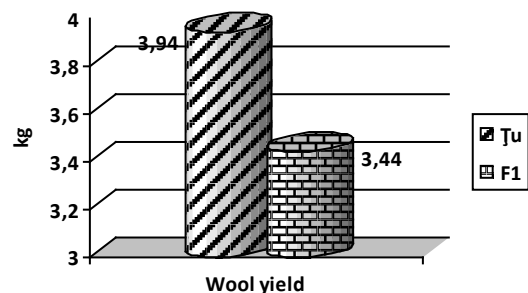


Figure 2. Graphical representation of the differences between the two genotypes concerning the wool yield

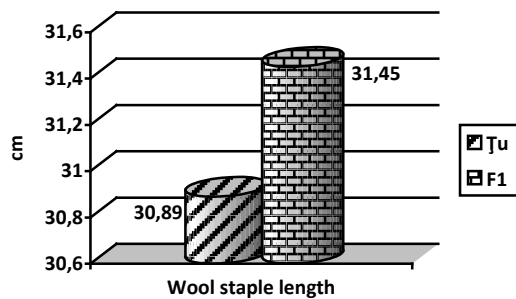


Figure 3. Graphical representation of the differences between the two genotypes concerning the wool staple length

Wool staple length, which is a very important trait for the wool producing industry was close in value for the Turcana yearlings (30.89 cm) with that of the crossbreeds (31.45 cm), the difference among groups of 0.56 cm (1.8%) being non-significant ($p > 0.05$), as presented in Table 3.

The individual variability for the wool staple length was low towards medium, and close for the two genotypes, of 9.17% and 11.92%, respectively.

4. Conclusions

Body weight in F₁ German Blackheaded x Turcana (53.8 kg) was significantly higher ($p \leq 0.001$) compared to Turcana purebreds (45.0 kg).

Wool production was significantly higher ($p \leq 0.001$) in Turcana (3.94 kg) compared to the F₁ crossbreeds (3.44 kg) yearling ewes.

Wool staple length was similar in both genotypes, and the differences were not significant ($p > 0.05$).

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