

Results Regarding Body Weight and Average Daily Gain in Turcana and Crossbred Suffolk x Turcana Lambs

**Doina POPA¹, Mariana RUSU¹, Ioan PADEANU², Dorina COTIRLEA¹, Sorin VOIA²,
Doina SPRINJEAN¹, Constantin BOZDOG¹**

¹ Institute for Research and Development of Mountain Science, 557085, XIII, 53, Cristian, Sibiu, Romania

² Faculty of Animal Science and Biotechnologies, 300645, Calea Aradului, 119, Timisoara, Romania

Abstract. In order to improve meat production in Turcana sheep breed through crossbreeding, an experiment was carried out in the Institute for Research and Development of Mountain Science Cristian-Sibiu, study in which ewes from the indigenous Turcana breed were crossed with Suffolk rams, a breed specialized for meat production. There were two groups of lambs, a group consisted in Suffolk x Turcana crossbred lambs (10 females and 10 males) and a group of pure Turcana lambs (10 females and 10 males). The results showed that at birth, at weaning, at 70 days, 6 months, 12 months and 18 months both body weight and average daily gain were significantly ($p < 0.001$) higher in Suffolk x Turcana crossbred lambs by 15.4 - 29.30%, compared with Turcana lambs. There is a suggestion that Suffolk x Turcana crossbred lambs have better performance for meat production.

Keywords: crossbred lambs, mutton production.

INTRODUCTION

Sheep breeding is an economic activity, traditional, with great social implications. This activity has always been a source of food for farmers and feedstock to meet family needs, but also for trade [1, 2]. Current and future economic situations are and will reveal the need for reassessment of the potential of Romania, as sheep meat production and enhancement of its favorable economic conditions [3, 4]. If we take into account the practice and experience of other countries that have achieved outstanding results in the production of meat [5, 6], we expect that the most rapid increase in the actual production is throughout hybridization of indigenous breeds, in our case Turcana breed, which has a 70% share in the structure of breeds in Romania, with specialized breeds for meat production, as the Suffolk breed.

MATERIALS AND METHODS

The study was conducted at the Institute for Research and Development of Mountain Science Cristian - Sibiu, during the years 2009-2010.

The purpose of this study was to assess body weight and average daily gain in crossbred Suffolk x White Turcana from the Sibiu-ecotype, from birth until the age of 18 months.

Two experimental groups were formed (Turcana breed lambs were the control group, Suffolk x Turcana crossbreed constituted the experimental group). Body weight was recorded at birth, weaning (70 days) and then at 6, 12 and 18 months, with a precision of 0.1 kg. Turcana purebred lambs and crossbreed lambs Suffolk x Turcana were reared from birth to 18 months under the same conditions. After weaning, the lambs in experimental and control groups were fed on green pasture and received a supplement of 100 g / day of concentrates with 14% protein. The data were statistically processed and interpreted. To test the significance of differences between the average body weights, Nonparametric Mann-Whitney test was used, test specific for smaller numbers of individuals [7].

RESULTS AND DISCUSSION

Experiments were conducted in the ICDM Cristian, and aimed the assessing of the body weight and average daily gain in crossbreed lambs Suffolk x Turcana, from birth until the age of 18 months compared with those of purebred Turcana.

After conducting this study, we obtained the results presented in Tables 1, 2 and 3.

Tab. 1.

Evolution of body weight in Suffolk x Turcana crossbreed lambs (SU x TA) compared with purebred Turcana lambs (TA)

Lambs	Sex	Weight/kg				
		At lambing	At weaning	6 months	12 months	18 months
SU x TA	F	3.900±0.15	19.600±0.23	31.700±0.29	38.750±0.34	47.150±0.36
TA	F	3.300±0.11	15.250±0.29	27.450±0.23	32.100±0.39	40.100±0.50
SU x TA	M	4.300±0.12	20.950±0.22	36.850±0.15	47.850±0.26	61.700±0.26
TA	M	3.600±0.12	16.200±0.17	30.400±0.23	38.750±0.35	50.400±0.12

Note: TA – White Turcana breed; SU –Suffolk breed

Tab. 2.

Evolution of the average daily gain (ADG) in crossbreed Suffolk x Turcana lambs compared with purebred Turcana lambs

Lambs	Sex	n	ADG - g -		ADG - g -		ADG - g -		ADG - g -	
			0-70 days	CV%	71-180 days	CV%	181-360 days	CV%	361-540 days	CV%
SU x TA	F	10	224±3.40	4.91	110±1.65	4.70	39±0.65	5.67	47±0.91	6.21
TA	F	10	171±2.71	5.13	111±2.67	7.35	26±1.39	16.85	44±1.38	9.77
SU x TA	M	10	238±2.62	3.41	144±1.15	2.43	61±1.38	7.48	77±1.51	6.64
TA	M	10	180±2.08	3.74	129±2.08	4.95	46±1.18	7.83	65±1.82	8.97

Tab. 3.

The significance of differences in weight gain between crossbreed Suffolk x Turcana lambs compared with purebred Turcana lambs

Lambs	Sex	kg at lambing			kg at weaning			kg 6 months			kg 12 months			kg 18 months		
		Differences -kg-		p	Differences -kg-		p	Differences -kg-		p	Differences -kg-		p	Differences -kg-		p
		absolute	%		absolute	%		absolute	%		absolute	%		absolute	%	
SUxTA - TA	M	0.700 **	19.4	0.01	4.750 ***	29.3	0.0001	6.450 ***	21.2	0.0001	9.100 ***	23.4	0.0001	11.300 ***	22.4	0.0001
SUxTA - TA	F	0.600**	18.1	0.004	4.350***	28.3	0.0001	4.250 ***	15.4	0.0001	6.650***	20.7	0.0001	7.050***	17.5	0.0001

Note: p <0.01 distinct significance differences; p<0.001 very significance differences

The data presented in Table 1 shows that male F1 hybrids had an average birth weight of $4,300 \pm 0.13$ kg, with 19% higher than Turcana lambs ($3,600 \pm 0.394$ kg) and female F1 hybrids had the The average birth weight of $3,900 \pm 0.15$ kg, up 18% from Turcana lambs ($3,300 \pm 0.11$ kg)

At weaning, the difference in body weight of lambs increased hybrids, they are heavier with 29% males, and with 28.3% the females, compared with purebred Turcana lambs. At 6 months, the differences in body weight increased to 6.45 kg crossbreed male lambs and keep to the same extent as 4.25 kg at weaning in crossbreed female lambs, compared to purebred Turcana lambs. Male crossbreed lambs are characterized by differences and 12 months (+ 9.1 kg) and 18 months (+ 11.3 kg) and in female crossbreeds the differences between the two groups were moderate (+ 6.65 kg and 7.05 kg) compared with purebred Turcana lambs from the control group.

Thus, at the age of one year, Suffolk x Turcana hybrids have achieved an average body weight of $47,850 \pm 0.26$ kg males and $38,750 \pm 0.35$ kg females, higher by 22.5% and 20.07 % compared with purebred Turcana lambs. The differences in body weight compared to lambs in the control group lambs was higher in hybrid males (+ 23.4%) compared with hybrid females (+ 20.7%). At 18 months, crossbreed lambs had an average body weight of $61,700 \pm 0.823$ kg, with 22.4% higher than purebred Turcana male lambs of the same age group. Crossbreed females achieved at 18 months an average body weight of $47,150 \pm 1.132$ kg, higher by 17.5% to purebred Turcana females.

During the reported period the highest average daily gain in all four groups of lambs was obtained during birth - weaning. Turcana breed lambs made an average daily gain close but below 200 g/day (171 g in females and 180 g in males), and hybrid lambs maintained under the same conditions as Turcana lambs, increases exceeding 200 g/day (224 females and 238 g/day in males). In the following three periods analyzed hybrids of both sexes have achieved higher average daily gains compared to purebred Turcana lambs. Average daily gain was higher in hybrids, with the largest differences between birth and 6 months, during which more strongly emphasized the superiority of hybrids in terms of increasing intensity. Similar results were obtained in our country by other authors [8, 9]. Data from the literature, which shows the performance achieved by hybrids obtained by crossing the Turcana breed with specialized breeds for meat production, in all cases show better performance compared with local native breeds [10, 11].

In Romania, a lot of experiments have been carried out on numerous experiments for the production of meat hybridization between indigenous sheep breeds (Palas Merino, Transylvanian Merino, Turcana) and specialized sheep breeds for the production of mutton from the western Europe (Texel, Ile de France, Berrichone, Merinofleisch, Border Leicester, Southdown, Suffolk) in particular at the Institute for Research and Development for Sheep and Goats Palas Constanta. Summarizing the results obtained by several authors noted that the best results on body weight, average daily gain, specific consumption and slaughter yield, were obtained from hybrids between the Suffolk breed and indigenous breeds. [3, 11]

Thus, Suffolk x Turcana hybrids have achieved a daily average with 12.35% higher, with a lower specific consumption with 12.70, and a higher slaughter yield of 3.58%. Comparing these results with those obtained from our collective, one could view that they are relevant and point out that the lambs of indigenous sheep hybrids between White Turcana ewes ecotype of Sibiu and Suffolk rams had higher performance.

Following this experiment we can conclude that in the same rearing conditions Suffolk x Turcana crossbreed lambs have a significantly higher growth rate from birth to 18 months. On the other hand some hybridization experiments carried out in Romania between breeds for

meat and local breeds, have found that hybrids have a better yield at slaughter, a larger amount of meat carcass. In our experiment we found that hybrids Suffolk x White Turcana ecotype of Sibiu sexually mature earlier (6-7 months), and hybrid lamb ewes are better suited for early lambing (November-January). Sibiu is the receptivity of farmers in different orientation in relation to meat production. Some of them even admit that meat production is profitable; do not want to replace local populations to those used for meat. Others would accept performance improvement programs for local populations through hybridization meat, unless they be affected milk production.

CONCLUSIONS

Body weight in crossbreed Suffolk x White Turcana ecotype of Sibiu was significantly ($p < 0.01$) higher at birth (19.4% to 18.1% in males and females), at 70 days (29 , 3% and 28.3%) at 6 months (21.2% and 15.4%) at 12 months (23.4% and 20.7%) and 18 months (22 , 4% and 17.5) compared with purebred Turcana lambs. Average daily gain rate was also highest crossbreed lambs Suffolk x White Turcana. The highest average daily gain was registered in the birth-weaning period (0-70 days), in both crossbreed lambs (294 g/day for females and 238 g/day in males) and purebred Turcana lambs (171 g/day females and 180 g in males).

REFERENCES

1. Tafta, V., Rearing technologies for fattening lambs and goat-kids, Ed. Ceres, București, Romania, 2001
2. Tafta, V., Breeding sheep in small and medium sized farms, Editura Ceres, Bucuresti, Romania, 2003
3. Padeanu, I, Technical evaluation and genetical improvement of sheep productions Ed. Mirton, Timisoara, Romania, 2003
4. Voia, S.O., Sheep and goats productions – Evaluation tehniques, Ed. Marineasa Timișoara, Romania, 2005
5. Pasca, I., Roman, M., Animal breeding and rearing systems, Ed. Risoprint, Risoprint, Romania, 2007
6. Pivoda Carmen et al., Reproduction, growth and exploitation of sheep and goats in small and medium sized farms, Ed. Europolis, Constanta, Romania, 2006
7. Sandu, GH., Experimental models in animal science, Ed. Coral Sanivet, Bucuresti, Romania, 1995
8. Pascal, C, 2007, Study regarding indigenous sheep populations reared in the north-eastern part of Romania and possibilities of improving meat production, Project PNII, Romania
9. Vicovan, P.G, 2010, PS 411, Realisation of composite sheep populations for substitution of the specialized breeds needed for crossbreeding programes
10. Pascal, C., Breeding of sheep and goats, Editura PIM, Iasi, Romania, 2007
11. Pascal, C, 2009 P.S.4.1.8, Realisation of sheep specialized crossbreeds for meat production