Comparison of Slaughter Yield and Carcass Quality Indices in R_1 German Blackheaded Mutton x Turcana and Purebreed Turcana

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Abstract
Aim of the research was to evaluate the effects that backcrossing of the German Blackheaded Mutton (GBM) breed with indigenous Turcana (TUR) breed have on the growth rates, slaughter yields and carcass quality, compared with animals from purebreed Turcana. Researches were carried out in the Sheep and Goats Research and Development Station from Caransebes, during a period of 3 years. The flock of pure breed Turcana ewes, managed by the Research Station was crossed with rams imported from Germany. F_1 German Blackheaded Mutton ewes were back-crossed with rams from the german specialized breed, the R_1 crossbreed that had 75% genes from the German Blackheaded Mutton was examined starting lambing until slaughter. Results shown that average daily gain of R_1 GBM x TUR was 221.50 grams, compared to 177.60 grams in Turcana lambs. Slaughter yield was 48.85% in R_1 GBM and 42.17% in Turcana, differneces registered of 6.68% were very singnificant statistically ($p<0.001$). Meat percentage from total dead-weight was on average of 78.33% in R_1 GBM, compared with 74.38% in pure breed Turcana ($p<0.001$). Results suggest that R_1 German Blackheaded Mutton could be used as a terminal sire in order to improve slaughter yield and carcass quality.

Keywords: Carcass quality, German Blackheaded Mutton, Slaughter yield, Turcana

1. Introduction

In Romania, the Turcana breed is the most widespread breed and represents arround 60% from the romanian total sheep population [4]. Growth rates in Turcana lambs are low, compared to specialized meat breeds, arround 190-230 g compared with 320-380 g under appropriate feeding conditions.
Under pasture conditions, average daily gain is even lower, arround the value of 150-180 g in Turcana lambs, if no concentrates are suplemented to the lambs. But, the Turcana breed is well appreciated by the farmers for her outstanding organic rezistance to extreme weather, parasits and pour feeding conditions.
German Blackheaded Mutton is a specialized breed, with very good aptitudes for meat production, but on intensive and semi-intensive systems, when they grow on average with a rate of 420-450 g/day [5].
Aim of the current research was to evaluate the effects that backcrossing of the German Blackheaded Mutton (GBM) breed with indigenous Turcana (TUR) breed have on the

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growth rates, slaughter yield and carcass quality, compared with animals from pure breed Turcana.

2. Materials and methods

Researches were carried out in the Sheep and Goats Research and Development Station from Caransebes, during a period of 3 years. The flock of pure breed Turcana ewes, from the Creata de Caransebes ecotype, managed by the Research Station was crossed with German Blackheaded Mutton rams imported from Germany.

F_1 German Blackheaded Mutton ewes were back-crossed with rams from the german specialized breed, the R_1 crossbreed that had 75% genes from the German Blackheaded Mutton were examined starting lambing until slaughter.

R_1 GBU x TUR and purebreed Turcana 20 male lambs were included in our research, 10 from each group were control fattened starting at the age of 70 days and finishing at 150 days.

At the age of 150 days, the males were sent to a slaughter plant, were the carcass assessment was made by authorized personel.

Male lambs from the two groups were offered a diet consisting in 6.5 kg pasture fresh feed and 300 g of concentrates per animal.

Turcana, Creata de Caransebes ecotype is an animal selected towards milk production, with a more fine constitution, but with low aptitudes for meat production by means of growth rates, carcass quality and slaughter yield.

The carcasses were clasified acourding to the E.U. regulations in the EUROP system.

3. Results and discussion

As presented in Table 1, average body weight of R_1 males at the age of 70 days was registered 21.82 kg, with limits ranging between 18.80 and 24.10 kg.

Body weight of the Turcana male lambs was on average of 16.90 kg at the age of 70 days, with limits ranging between 14.70 and 18.20 kg. Differences registered of 4.92 kg were very significant statistically ($p<0.001$).

Average body weight at the age of 150 days in R_1 male lambs was of 39.58 kg, with limits ranging between 35.95 and 42.30 kg.

In purebreed Turcana lambs, average body weight was registered at 31.14 kg, with limits ranging between 28.60 and 32.80 kg.

Differences registered of 8.44 kg were very significant statistically ($p<0.001$).

Average daily gain in R_1 male lambs was registered at 221.50 g, with limits ranging between 213.00 and 227.00 g. In Turcana male lambs, the average value of the daily gain was 117.60 g, with limits ranging between 173 and 183 g. Differences of 43.90 g per day were tested as beeing very significant statistically ($p<0.001$).

Under same feeding conditions, R_1 male lambs have a significantly higher growth rates during enitre testing period, as well as the begining and at the end of the testing period.

Averege daily gain is also superior in R_1 male lambs compared to purebreed Turcana male lambs at the same age.

In Table 2 are presented data regarding slaughter yield and carcass quality in R_1 and control group at the age of 150 days.

Slaughter yield in R_1 males was registered on average of 48.85%, with limits ranging between 47.32 and 50.24%.

In the control group, this parameter was on average of 42.17%, with limits ranging from 40.32 to 44.72%.

Differences registered of 6.68% were very significant statistically ($p<0.001$).

Muscularity index in R_1 male lambs was on average of 0.50, with limits ranging between 0.74 and 0.54.

In purebreed Turcana male lambs, this index was registered on average arround the value of 0.42, with limits ranging between 0.39 and 0.45. Diferences between the two groups were of 0.08, tested as beeing very significant statistically ($p<0.001$).

Percent of meat in carcass of R_1 male lambs was registered on average at the value of 78.33%, with limits ranging between 75.98 and 80.01%.

In purebreed Turcana male lambs, the percent of meat in carcass was registered at the average of 74.38%, with limits ranging between 71.23 and 76.92%.

Differences registered between the two groups were tested as very significant statistically ($p<0.001$) due to the fact that the average differences were of 3.95% in the proportion of meat in carcass.

Also in slaughter yield and carcass quality, R_1 male lambs are superior to purebreed Turcana lambs.

Nevertheless, in both R_1 and control group, all quality carcass indices are lower that one my wish for a specialized sheep meat population, and further research must be done, in order to improve both slaughter yield and carcass quality.

Results suggest that R_1 German Blackheaded Mutton could be used as a terminal sire in order to improve slaughter yield and carcass quality.

Table 1. Body weight of the lambs from at 70 and 150 days, and the average daily gain of the lambs during the testing period

Trait	$X \pm S_x$	SD	cv (%)	Min	Max
Weight at 70 days in R1 males (kg)	21.82±0.60	1.90	8.73	18.80	24.10
Weight at 150 days in R1 males (kg)	39.58±0.71	2.25	5.69	35.95	42.30
Average daily gain in R1 males (g)	221.50±1.65	5.23	2.36	213.00	227.00
Weight at 70 days in TA males (kg)	16.90±0.37	1.18	7.01	14.70	18.20
Weight at 150 days in TA males (kg)	31.14±0.42	1.35	4.35	28.60	32.80
Average daily gain in TA males (g)	177.60±0.89	2.84	1.60	173.00	183.00
Diferences in 70 days body weight		4.92 kg ***			
Diferences in 150 days body weight		8.44 kg ***			
Diferences in average daily gain		43.90 g ***			

Table 2. Slaughter Yield and Carcass Quality in R_1 and control group at the age of 150 days

Trait	$X \pm S_x$	SD	cv (%)	Min	Max
Slaughter yield in R_1 males	48.85±0.27	0.88	1.81	47.32	50.24
Muscularity index in R_1 males	0.50±0.007	0.02	4.58	0.47	0.54
% of meat in carcass in R_1 males	78.33±0.42	1.33	1.70	75.98	80.01
Slaughter Yield in Turcana males	42.17±0.42	1.33	3.16	40.23	44.72
Muscularity index in Turcana males	0.42±0.006	0.01	4.63	0.39	0.45
% of meat in carcass in Turcana males	74.38±0.56	1.77	2.38	71.23	76.92
Diferences in slaughter yield		6.68 % ***			
Diferences in muscularity index		0.08 ***			
Diferences in % of meat in carcass		3.95 % ***			

4. Conclusions

»Under same feeding conditions, R_1 male lambs have a significantly higher growth rates during testing period (70-150 days).

»Averege daily gain was superior in R_1 male lambs compared to purebreed Turcana male lambs of the same age, 221.5 g compared to 117.6 g, differences very significant statistically ($p<0.001$).

»Slaughter yield and carcass quality in R_1 male lambs (48.85%, 78.33%) are superior to purebreed Turcana lambs (42.17%, 74.38%), differences were tested as very significant statistically for all three parameters considered ($p<0.001$).

»Nevertheless, in both R_1 and control group, all quality carcass indices are lower that one my wish for a specialized sheep meat population, and further research must be done in this area.

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