

# Improving Growth Rates in Turcana Indigenous Sheep Breed Using German Blackheaded Mutton Rams

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## Abstract

Improving growth rates in indigenous Turcana breed should be one of the most important objectives for sheep specialists, do to the fact that over 70% of the sheep population from Romania is represented by the breed. Researches were carried out in a commercial farm from Timis county, on a number of 48 crossbred F<sub>1</sub> German Blackheaded Mutton x Turcana (GBMT) lambs, the control group was represented by purebred Turcana (TU) lambs, both males and females (33 heads). The lambs were weighed at birth, at 28 days and at 8 months of age. During first 28 days, F<sub>1</sub> GBMT registered an average daily gain of 229.46 g, compared to Turcana lambs witch registered an average of 194.12 g, differences being very significant statistically ( $p < 0.001$ ). Total growth gain at the age of 240 days was registered 40.51 kg in crossbred lambs, and of 33.35 kg in purebred Turcana lambs, differences were very significant statistically between the two groups ( $p < 0.001$ ). German Blackheaded Mutton rams could be used as crossing sires for indigenous Turcana breed in order to substantially improve growth rates in F<sub>1</sub> lambs.

**Keywords:** German Blackheaded Mutton, Improving growth rates, Turcana ewes.

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## 1. Introduction

In Romania, the Turcana breed is the most widespread breed and represents around 70% from the Romanian total sheep population [1].

Growth rates in Turcana lambs are low, compared to specialized meat breeds, ranging between 190 and 230 g when reared in semi-intensive systems. Under pasture conditions, average daily gain is even lower, around the value of 140-180 g in Turcana lambs, if no concentrates are supplemented to the lambs [2, 3].

But, the Turcana breed is well appreciated by the farmers for her outstanding organic resistance to extreme weather, parasites 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 [4].

Improving growth rates in indigenous Turcana breed should be one of the most important objectives for sheep specialists in Romania, do to the fact that over 70% of the sheep population from our country is represented by this breed. Aim of the current research was to evaluate the effects that crossing of the German Blackheaded Mutton rams with indigenous Turcana ewes have on the growth rates of F<sub>1</sub> crossbred lambs.

## 2. Materials and methods

Experiments were carried out in a comercial sheep farm from Timis county, in a comercial flock of purebred Turcana.

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A number of two rams from the German Blackheaded Mutton breed, imported from Germany were mated to Turcana ewes during the normal reproduction season (September - October) in a 1/40 ratio.

Rest of the ewes were presented to purebred Turcana rams, and the lambs were included in the control group.

Lambing season occurred during February, and 81 lambs were randomly chosen for research purposes, from which 48 lambs were F<sub>1</sub> GBMT and 33 purebred Turcana lambs.

Lambs were weaned in late April, both groups at the same time, and separated according to their genders. During time they were kept with their dams, the lambs were not fed supplemented with concentrates, they were offered only hay and green fresh feed from pastures.

After weaning, lambs were kept on pastures 24/7, and were fed only with green fresh feed from natural-unimproved pasture of low quality.

Lambs weight was monitored at birth, 28 days and 240 days intervals.

Weighing of lambs was made using an electronically scale, during morning time each time in order to prevent differences due to the forage intake.

Averages and dispersion indices were calculated according to the weighings results, and differences were tested using Mann-Whitney test.

### 3. Results and discussion

In Table 1 are presented weight of F<sub>1</sub> German Blackheaded Mutton x Turcana and purebred Turcana lambs at birth, at 28 days and at 240 days, in both male and female lambs.

F<sub>1</sub> German Blackheaded Mutton x Turcana lambs had an average birth weight of 4.86 kg, with limits ranging between 2.90 and 6.10 kg.

In Turcana lambs, average birth weight were of 3.90 kg, with limits ranging between 2.80 and 4.80 kg.

Differences registered between the two groups were on average of 0.96 kg, differences that were tested as very significant statistically ( $p < 0.001$ ).

F<sub>1</sub> German Blackheaded Mutton x Turcana lambs had an average body weight at the age of 28 days of 11.22 kg, with limits ranging between 8.50 kg and 12.60 kg.

Turcana lambs had an average body weight at the age of 28 days of 9.23 kg, with limits ranging between 7.80 and 11.00 kg.

Differences registered between the two groups of 1.99 kg were tested as being very significant statistically ( $p < 0.001$ ).

Weight at 240 days in F<sub>1</sub> German Blackheaded Mutton x Turcana lambs was on average 45.13 kg, with limits ranging between 35.00 and 55.30 kg. In purebred Turcana lambs, average body weight was 37.00 kg, with limits ranging between 33.30 and 44.60 kg.

Differences registered were on average of 8.13 kg, differences very significant statistically ( $p < 0.001$ ). In table 2 are presented averages and dispersion indices for average daily gain and growth gain in F<sub>1</sub> German Blackheaded Mutton x Turcana and Turcana lambs.

Average daily gain of F<sub>1</sub> German Blackheaded Mutton x Turcana lambs was on average 229.46 g, with limits ranging between 150 and 292 g. In purebred Turcana, average was 194.12 g, with limits ranging between 125 and 282 g.

Differences registered between the two groups were of 35.34 g, tested as being very significant statistically ( $p < 0.001$ ).

Average daily gain of F<sub>1</sub> German Blackheaded Mutton x Turcana lambs was registered at 168.35 g at the age of 240 days, with limits ranging between 126 and 212 g. Purebred Turcana lambs registered an average daily gain of 138.45 g, with limits ranging between 120 and 168 g.

Differences of 29.9 g per entire 240 days interval were very significant statistically ( $p < 0.001$ ).

Total growth gain in F<sub>1</sub> German Blackheaded Mutton x Turcana lambs at 28 days was on average of 6.43 kg, with limits ranging between 4.20 and 8.20 kg. In Turcana lambs, average growth gain was of 5.43 kg, with limits ranging between 3.50 and 7.90 kg.

Differences were of 1.00 kg, tested as very significant statistically between the two experimental groups ( $p < 0.001$ ).

Total growth gain in F<sub>1</sub> German Blackheaded Mutton x Turcana lambs was registered at 40.51 kg, with limits ranging between 30.30 and 51.00 kg. In purebred Turcana, total weight gain average was of 33.35 kg, with limits ranging between 29.00 and 40.40 kg.

Difference of 7.16 kg at the end of the testing period was tested as being very significant

statistically ( $p < 0.001$ ) among the two controlled groups.

German Blackheaded Mutton rams could be used as crossing sires for indigenous Turcana breed in

order to improve substantial growth rates in  $F_1$  lambs.

**Table 1.** Weight in  $F_1$  German Blackheaded Mutton x Turcana and purebred Turcana lambs (kg)

Trait	n	$\bar{X} \pm S_x$	SD	cv (%)	Min	Max
$F_1$ GBM x TA (at birth)	48	4.86±0.11	0.76	15.78	2.90	6.10
$F_1$ GBM x TA male lambs	30	4.96±0.14	0.80	16.19	3.20	6.10
$F_1$ GBM x TA female lambs	18	4.55±0.16	0.67	14.89	2.90	5.30
Turcana lambs (at birth)	33	3.90±0.10	0.59	15.22	2.80	4.80
Turcana male lambs	18	4.10±0.10	0.43	10.65	3.40	4.80
Turcana female lambs	15	3.60±0.17	0.67	18.55	2.80	4.40
Weight differences at birth			0.96 kg ***			
$F_1$ GBM x TA (at 28 days)	48	11.22±0.16	1.12	10.06	8.50	12.60
$F_1$ GBM x TA male lambs	30	11.49±0.18	0.99	8.63	9.70	12.60
$F_1$ GBM x TA female lambs	18	10.82±0.28	1.20	11.14	8.50	12.10
Turcana lambs (at 28 days)	33	9.23±0.14	0.82	8.96	7.80	11.00
Turcana male lambs	18	9.45±0.18	0.77	8.21	8.20	11.00
Turcana female lambs	15	8.98±0.21	0.83	9.35	7.80	10.40
Weight differences at 28 days			1.99 kg ***			
$F_1$ GBM x TA (at 240 days)	48	45.13±0.82	5.69	12.61	35.00	55.30
$F_1$ GBM x TA male lambs	30	46.77±1.18	6.44	13.77	35.00	55.30
$F_1$ GBM x TA female lambs	18	42.40±0.58	2.47	5.84	39.80	46.50
Turcana lambs (at 240 days)	33	37.00±0.70	4.06	10.99	33.30	44.60
Turcana male lambs	18	39.08±0.97	4.13	10.57	33.30	44.60
Turcana female lambs	15	35.56±0.69	2.69	7.58	33.40	39.50
Weight differences at 240 days			8.13 kg ***			

**Table 2.** Average daily gain and growth gain in  $F_1$  German Blackheaded Mutton x Turcana and Turcana lambs

Trait	n	$\bar{X} \pm S_x$	SD	cv (%)	Min	Max
ADG in $F_1$ GBM x TA (0-28 days)	48	229.46±4.56	31.80	13.86	150.00	292.00
Male lambs	30	232.97±5.64	30.91	13.27	157.00	292.00
Female lambs	18	223.61±7.84	33.28	14.88	150.00	267.00
ADG in Turcana lambs (0-28 days)	33	194.12±6.66	38.25	19.70	125.00	282.00
Male lambs	18	196.89±9.01	38.21	19.41	139.00	282.00
Female lambs	15	190.80±10.20	39.40	20.63	125.00	260.00
Differences in average daily gains (0-28)			35.34 g ***			
ADG in $F_1$ GBM x TA (0-240 days)	48	168.35±3.36	23.26	13.82	126.00	212.00
Male lambs	30	175.10±4.80	26.28	15.01	126.00	212.00
Female lambs	18	157.11±2.41	10.21	6.50	144.00	174.00
ADG in Turcana lambs (0-240 days)	33	138.45±2.91	16.74	12.09	120.00	168.00
Male lambs	18	145.22±3.99	16.91	11.64	122.00	168.00
Female lambs	15	130.33±3.30	12.79	9.82	120.00	151.00
Differences in average daily gains (0-240)			29.9 g ***			
TGG in $F_1$ GBM x TA (0-28 days)	48	6.43±0.12	0.89	13.91	4.20	8.20
Male lambs	30	6.53±0.15	0.87	13.34	4.40	8.20
Female lambs	18	6.27±0.22	0.93	14.90	4.20	7.50
TGG in Turcana lambs (0-28 days)	33	5.43±0.18	1.06	19.59	3.50	7.90
Male lambs	18	5.52±0.25	1.06	19.36	3.90	7.90
Female lambs	15	5.32±0.28	1.08	20.37	3.50	7.30
Differences in total growth gain (0-28)			1.00 kg ***			
TGG in $F_1$ GBM x TA (0-240 days)	48	40.51±0.80	5.58	13.79	30.30	51.00
Male lambs	30	42.14±1.15	6.30	14.96	30.30	51.00
Female lambs	18	37.80±0.57	2.44	6.46	34.70	41.90
TGG in Turcana lambs (0-240 days)	33	33.35±0.70	4.02	12.06	29.00	40.40
Male lambs	18	34.98±0.96	4.07	11.65	29.30	40.40
Female lambs	15	31.40±0.78	3.04	9.71	29.00	36.40
Differences in total growth gain (0-240)			7.16 kg ***			

\* ADG – average daily gain; TGG – total growth gain

#### 4. Conclusions

» During first 28 days F<sub>1</sub> GMB x TU registered an average daily gain of 229.46 g,

compared to Turcana lambs witch registered an average of 194.12 g, differences being very significant statistically (p<0.001).

» Total growth gain at the age of 240 days was registered 40.51 kg in F<sub>1</sub> crossbreed lambs, and of 33.35 kg in purebreed Turcana lambs, differences were very significant statistically between the two groups (p<0.001).

» German Blackheaded Mutton rams could be used as crossing sires for indigenous Turcana breed in order to improve substantial growth rates in F<sub>1</sub> crossbreed lambs.

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