

Growth Performance Evaluation in F₁ Hampshire Down x Turcana Lambs Reared in Low Input Systems

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Abstract

Aim of the study was to evaluate growth performance of F₁ Hampshire Down x Turcana (HDT) lambs compared to purebred Turcana (TU) lambs, reared in Low Input systems. Experiments were carried out in a commercial farm from Timis county, on a number of 37 crossbreed F₁ HDT lambs, the control group was of 33 purebred Turcana lambs, raised in the same conditions. Birth weight of both HDT and TU lambs, weight at 28 days and weight at 8 months, in both male and female lambs was registered. Lambs were raised with their dams on pastures, with no concentrates, until the age of 3 months. After weaning, lambs were separated according to their sex, into two flocks. Commercialization had place at the age of 8 months for male lambs and, ewe lambs were kept for breeding purposes. Body weight of HDT group was on average of 39.31 kg in HDT and of 37.00 kg in TU group (p<0.01).

Keywords: Growth performance, Hampshire Down, Low Input system, Turcana breed.

1. Introduction

Maximization of system output is not necessarily economically efficient.

Accelerated lambing and other intensive management practices (e.g. artificial rearing and hormonal or light treatment) can increase productivity, but greater overhead costs associated with extra labor and specialized facilities required to operate intensive management systems may not be offset by gains in ewe productivity [1].

Hampshire Down breed has been developed to provide terminal sires for commercial flocks. Hampshire Down sired lambs are early maturing quality butchers' lambs.

The breed is particularly valued there because of the high quality quick maturing lambs and the ability to survive both in extremes of cold as

found in the Massif Central in France and of heat as experienced by a continental summer, without shelter. World-wide, Hampshires are to be found in over 40 countries [2].

Romanian Turcana breed is a well adapted breed to our feeding and housing conditions, but has a great handicap in growth rates and carcass quality [3, 4]. Thus, a crossing with an specialized meat breed as a terminal sire could improve incomes of the Turcana breeders, with benefic effects on the economicity of the farms that practice low input sheep rearing [5].

Aim of the study was to evaluate growth performance of F₁ Hampshire Down x Turcana (HDT) lambs compared to purebred Turcana (TU) lambs, reared in Low Input systems.

2. Materials and methods

Experiments were carried out in a commercial sheep farm from Timis county, that was populated with purebred Turcana. A number of four rams

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from the Hampshire Down breed, imported from the United Kingdom were presented 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 occurred mainly during February and starting of March.

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 supplemented fed 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 weighing results, and differences were tested using Mann-Whitney test.

3. Results and discussion

In table 1 are presented averages and dispersion indices regarding body weight in F₁ Hampshire Down x Turcana and purebred Turcana lambs at birth, 28 days and 240 days.

Average body weight at birth in F₁ Hampshire Down x Turcana lambs was 4.41 kg, with averages ranging between 3.20 and 5.60 kg. In male lambs, average birth weight was 4.51 kg, with limits between 3.20 and 5.60 kg. While in female crossbreed lambs birth weight was 4.32 kg, with limits ranging from 3.90 to 5.10 kg.

In Turcana lambs, average birth weight was of 3.90 kg, with limits ranging between 2.80 and 4.80 kg. In male lambs, average birth weight was 4.10 kg, with limits between 3.40 and 4.80 kg. While in female purebred lambs birth weight was 3.600 kg, with limits ranging from 2.80 to 4.40 kg. Differences between the two groups were on average of 0.51 kg, tested as being distinctly significant ($p < 0.01$).

Body weight at 28 days was registered on average around the value of 12.28 kg in crossbreed lambs, with limits ranging between 9.70 and 14.50 kg. And averages of 9.23 kg in purebred Turcana

lambs, with limits ranging between 7.80 and 11.00 kg. Differences between the two groups were on average of 3.05 kg, differences tested as very significant statistically ($p < 0.001$).

Average body weight at 240 days was 39.31 kg in F₁ lambs, with limits ranging between 34.40 and 45.30 kg. And of 37.00 kg in purebred Turcana lambs, with limits ranging between 33.30 and 44.60 kg. Sexual dimorphism was noticed in both groups, male lambs had a higher body development compared to female lambs, 41.22 kg versus 37.85 kg in F₁ crossbreed lambs, respectively 39.08 kg compared to 35.56 kg in Turcana lambs.

Differences were on average of 2.30 kg, tested as being distinctly significant ($p < 0.01$).

Body weight at birth of F₁ Hampshire Down x Turcana is higher with 0.51 kg, compared to purebred Turcana lambs ($p < 0.05$), result that suggest that Turcana ewes would not encounter major problems at lambing. Especially if the Hampshire Down rams will be put to mature ewes (age > 3 years).

Average daily gain in crossbreed lambs is much higher during first period (0-28 days) compared with purebred Turcana lambs ($p < 0.001$). Results witch suggest that Hampshire Down rams could be used on Turcana ewes in order to produce light lamb carcasses.

In table 2 are presented averages and dispersion indices regarding average daily gain and total growth gain in F₁ Hampshire Down x Turcana and purebred Turcana lambs.

Average daily gain during first period (28 days) in F₁ Hampshire Down x Turcana lambs, was on average 278.05 g, with limits ranging between 190 and 350 g. In purebred Turcana lambs, averages were of 194.12 g, with limits ranging between 125 and 282 g. Differences between the two groups were on average of 83.93 g, tested as being very significant statistically ($p < 0.001$).

At the age of 240 days, crossbreed lambs registered an average growth gain of 146.35 g, with limits ranging between 123 and 179 g. While the purebred Turcana lambs, registered an average daily gain of 138.45 g, with limits ranging between 120 and 168 g.

Differences among the two experimental groups were of 7.9 g per day, tested as statistically significant ($p < 0.05$).

Total growth gain in F₁ Hampshire Down x Turcana lambs at the age of 28 days was on

average of 7.87 kg, with limits ranging between 5.50 and 9.80 kg. In Turcana lambs, average value was registered at 5.43 kg, with limits ranging between 3.50 and 7.90 kg. Differences were on average of 2.44 kg, tested as being very significant statistically ($p < 0.001$). At the age of 240 days, crossbreed lambs registered an average growth

gain of 35.23 kg, with limits ranging between 29.7 and 43.10 kg. In purebred Turcana, growth gain at this age was on average of 33.35 kg, with limits ranging from 29.00 and 40.40 kg. Differences were tested as statistically significant ($p < 0.05$), and had a average value of 1.88 kg.

Table 1. Body weight in F₁ Hampshire Down x Turcana and purebred Turcana lambs (kg)

Trait	n	$\bar{X} \pm S_x$	SD	cv (%)	Min	Max
F ₁ HD x TA (when lambed)	37	4.41±0.09	0.58	13.32	3.20	5.60
F ₁ HD x TA male lambs	16	4.51±0.18	0.73	16.33	3.20	5.60
F ₁ HD x TA female lambs	21	4.32±0.09	0.44	10.26	3.90	5.10
Turcana lambs (when lambed)	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
Body weight differences at birth			0.51 kg **			
F ₁ HD x TA (at 28 days)	37	12.28±0.18	1.13	9.22	9.70	14.50
F ₁ HD x TA male lambs	16	12.48±0.25	1.01	8.12	10.80	14.50
F ₁ HD x TA female lambs	21	12.14±0.26	1.22	10.06	9.70	13.80
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
Body weight differences at 28 days			3.05 kg ***			
F ₁ HD x TA (at 240 days)	37	39.31±0.65	4.00	10.19	34.40	45.30
F ₁ HD x TA male lambs	16	41.22±0.71	2.86	6.94	37.60	44.80
F ₁ HD x TA female lambs	21	37.85±0.91	4.19	11.08	34.40	45.30
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
Body weight differences at 240 days			2.31 kg **			

Table 2. Average daily gain and total growth gain in F1 Hampshire Down x Turcana and Turcana lambs

Category	n	$\bar{X} \pm S_x$	SD	cv (%)	Min	Max
ADG in F ₁ HD x TA (0-28)	37	278.05±6.22	37.85	13.61	190.00	350.00
Male lambs	16	281.44±7.20	28.80	10.23	250.00	330.00
Female lambs	21	275.48±9.61	44.02	15.98	190.00	350.00
ADG in Turcana lambs (0-28)	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)			83.93 g ***			
ADG in F ₁ HD x TA (0-240)	37	146.35±2.71	16.47	11.26	123.00	179.00
Male lambs	16	152.63±2.74	10.95	7.17	135.00	171.00
Female lambs	21	141.57±4.04	18.52	13.08	123.00	179.00
ADG in Turcana lambs (0-240)	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)			7.9 g *			
TGG in F ₁ HD x TA (0-28)	37	7.87±0.17	1.04	13.28	5.50	9.80
Male lambs	16	7.96±0.19	0.78	9.88	7.10	9.30
Female lambs	21	7.80±0.26	1.22	15.65	5.50	9.80
TGG in Turcana lambs (0-28)	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)			2.44 kg ***			
TGG in F ₁ HD x TA (0-240)	37	35.23±0.64	3.93	11.18	29.70	43.10
Male lambs	16	36.70±0.65	2.63	7.17	32.40	41.20
Female lambs	21	34.10±0.96	4.43	13.00	29.70	43.10
TGG in Turcana lambs (0-240)	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)			1.88 kg *			

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

4. Conclusions

Body weight at birth of F₁ Hampshire Down x Turcana is higher with 0.51 kg, compared to purebred Turcana lambs ($p < 0.05$), result that suggest that Turcana ewes would not encounter major problems at lambing. Especially if the Hampshire Down rams will be put to mature ewes (age >3 years).

Average daily gain in crossbreed lambs is much higher during first period (0-28 days) compared with purebred Turcana lambs ($p < 0.001$). Results witch sugeest that Hampshire Down rams could be used on Turcana ewes in order to produce light lamb carcasses.

At the age of 240 days, differences in terms of average daily gain and growth gain between the two groups are reduced, respectively 7.9 g and 1.88 kg, both parameters being statistically significant ($p < 0.05$). But from the economical point of view are not encouraging, due to the higher price of rams, transport and quarantine.

Acknowledgements

This work was published during the project "POSTDOCTORAL SCHOOL OF AGRICULTURE AND VETERINARY MEDICINE", POSDRU /89 /1.5 /S /62371, co-financed by the European Social Fund through the Sectorial Operational Programme for the Human Resources Development 2007-2013.

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