

## **Experimental Results Obtained in Fattening Norwegian White x Turcana Young Sheep**

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**Abstract.** The results of a fattening experiment during 79 days in male Norwegian White x Turcana hybrid young sheep and Turcana young sheep are presented in this paper. Both hybrids and Turcana pure breed young sheep were maintained in the same conditions, received the same food, and benefit of the same microclimate factors, during entire fattening interval. Even the hybrid Norwegian White x Turcana young sheep recorded superior average values in the beginning and in the end of the fattening interval, with 1.09 kg and 3.24 kg, respectively, compared to Turcana young sheep, these differences are statistically not significant. Significant statistical differences (2.15 kg and 0.03 kg) between both breed structures are recorded in total gain and average daily gain during fattening interval.

The significant differences between hybrid and Turcana young sheep are also recorded in cold carcass, gigot weight, cutlet weight, small carcass length, carcass width, and crupper. The slaughter yield was of 46.73% in Norwegian White x Turcana hybrids and 44.50% in Turcana young sheep, the difference between the average values (2.23%) being statistically not significant. Mann - Whitney non parametrical test was used for testing the significance of differences.

**Keywords:** Norwegian White x Turcana hybrids, Turcana, body weight, average daily gain, carcass traits

### **INTRODUCTION**

After 1990, in Romania, the orientation of sheep rearing was changed for meat and/or milk production, and this tendency is expected to be continued in the future years (Pădeanu, 2008; Voia, 2008; Dărăban, 2008).

The major way of rapid improvement of the growing speed, meat quality and milk production is the hybridising of the local sheep breeds (Turcana, Tsigai and Merino) with specialized sheep breeds for milk or meat production (Dărăban, 2008; Dragomirescu, 2007; Pădeanu, 2008). In this way, during last 10 years the professional associations of the sheep breeders from Romania, the specialized universities and research centres, performed imports of reproduction sheep females and males specialized in milk and meat productions, from different European countries. We can mention the import of the meat breeds as: German breed with black head in Sibiu area, and from here distributed in all Transylvania; Suffolk in Alba, Sibiu, Cluj and Dobrogea areas; Charollaise in Arad – Timiș areas; Hampshire in Cluj; Texel in Dobrogea area; Bluefaced in Timiș, Reghin and Bacău, and a less known meat population from Norway, Norwegian White sheep in Sălaj and Satu Mare areas.

For milk production we noticed the import of Sard males and females in Banat area and Milk Belgian rams brought with experimental aim by the University of Agricultural Sciences and Veterinary Medicine Cluj – Napoca.

These imports show the reorientation of the sheep breeders from mixed productions towards the unidirectional productions in a first stage, followed by their specialization within a short time according to European and world orientation (Dărăban, 2008).

## MATERIALS AND METHODS

The fattening experiment developed during 79 days time interval was performed on Norwegian White x Turcana male young sheep hybrids and Turcana male young sheep, obtained in a private farm from the county of Sălaj in 2008. The age of the hybrid and Turcana young sheep in the beginning of the fattening phase was of 145 days, and 160 days, respectively, and in the end of the fattening phase was of 225 days, and 240 days, respectively. Both groups made up of 12 heads each, benefit of the same maintaining and fodder conditions. During fattening interval (65 days) the male young sheep was fed with alfalfa hay and during finishing interval (14 days) with alfalfa hay and 1/308 combined forage supplements, destined to young sheep.

In the end of the fattening phase, 5 heads of each group were slaughtered, and carcass traits were recorded.

During fattening interval, in both groups the following parameters were determined: weight in the beginning and in the end of the fattening phase, total gain and average daily gain.

The following parameters were recorded in slaughtered young sheep: live weight before slaughter, cold carcass weight, slaughter yield, the share of the main carcass parts (gigot, cutlet with ribs) and conformational traits of the carcass (lengths, widths, depths).

## RESULTS AND DISCUSSION

The average daily gain and the fodder specific consumption are the most important growing parameters, which influence the biological and economical growing efficiency in fattening young sheep.

In table 1 is presented the dynamics of the body weight, total gain and average daily gain of the male young sheep during fattening interval, 79 days (08.08.2008–29.10.2008).

Tab. 1

The dynamics of the body weight in male young sheep during fattening

Trait	Breed	n	$\bar{X} \pm s_{\bar{X}}$	s	V%	Difference $\pm d$	Mann Whitney Test (p)
Weight in the beginning of fattening (kg)*	Norwegian White x Turcana	12	$28.81 \pm 1.41$	4.89	16.98	+ 1.09 ns	0.435
	Turcana	12	$27.72 \pm 1.11$	3.86	13.93		
Weight in the end of fattening (kg)**	Norwegian White x Turcana	12	$46.06 \pm 1.96$	6.80	14.76	+ 3.24 ns	0.272
	Turcana	12	$42.82 \pm 1.63$	5.66	13.22		
Total gain (kg)	Norwegian White x Turcana	12	$17.24 \pm 0.70$	2.44	14.16	+ 2.15*	0.013
	Turcana	12	$15.09 \pm 0.64$	2.23	14.80		
Average daily gain (kg)	Norwegian White x Turcana	12	$0.22 \pm 0.01$	0.001	14.16	+ 0.03*	0.013
	Turcana	12	$0.19 \pm 0.01$	0.03	14.80		

\* The age in the beginning of the fattening phase was 145 days in hybrids and 160 days in Turcana

\*\* The age in the end of the fattening phase was 225 days in hybrids and 240 days in Turcana

The average weight in the beginning of the fattening phase was of 28.81 kg in Norwegian White x Turcana hybrids and 27.72 kg in Turcana, and difference of 1.09 kg in

advantage of the hybrids is statistically not significant. In the end of the fattening phase, the hybrids recorded an average weight of 46.06 kg, and Turcana young rams 42.82 kg. The difference of 3.24 kg is statistically not significant (table 1).

Concerning total gain and average daily gain, the differences between the average values of the hybrids and those of Turcana breed are statistically significant.

The average daily gain recorded by the hybrid young rams was of 220 g and 190 g by Turcana young rams.

These average values are similar even superior to those recorded by Voia S. et al., 2008 in three Turcana lamb groups fattened during 54 days interval.

The average values and differences concerning weight before slaughter, cold carcass weight, slaughter yield, and weight of the carcass regions in male young sheep are presented in table 2. Thus, Norwegian White x Turcana hybrids realize an average slaughter weight of 43.1 kg, while Turcana young sheep 37.44 kg. Even relatively big difference between both breed structures is recorded (+ 5.66 kg) in advantage of hybrids, it is statistically not significant.

The cold carcass weight in hybrids and Turcana breed recorded average values of 20.21 kg and 16.62 kg, respectively, with a significant difference (+3.58 kg) in advantage of the hybrids. Function of the European Community standards, the carcasses of the Norwegian White x Turcana hybrids frame within the heavy carcass weight category (19 – 22 kg), while carcasses in Turcana breed frame within average carcass weight category (16 – 19 kg).

Tab. 2

The average values of the carcass weight, slaughtering yield and main carcass regions

Trait	Breed	n	$\bar{X} \pm s_{\bar{X}}$	s	V%	Difference $\pm d$	Mann Whitney Test (p)
Weight before slaughtering (kg)	White Norwegian x Turcana	5	$43.1 \pm 2.50$	5.60	12.98	+ 5.66 ns	0.076
	Turcana	5	$37.44 \pm 1.70$	14.46	10.16		
Cold carcass weight (kg)	White Norwegian x Turcana	5	$20.21 \pm 1.55$	3.46	17.12	+ 3.58*	0.047
	Turcana	5	$16.62 \pm 0.74$	1.65	9.95		
Slaughter yield (%)	White Norwegian x Turcana	5	$46.73 \pm 1.61$	3.60	7.71	+ 2.23 ns	0.754
	Turcana	5	$44.50 \pm 1.46$	3.27	7.35		
Gigot weight (kg)	White Norwegian x Turcana	5	$6.61 \pm 0.50$	1.13	17.04	+ 1.76 *	0.047
	Turcana	5	$4.85 \pm 0.24$	0.29	11.05		
Cutlet weight (kg)	White Norwegian x Turcana	5	$3.39 \pm 0.26$	0.58	17.26	+ 0.63 *	0.047
	Turcana	5	$2.85 \pm 0.15$	0.12	12.55		
Gigot + cutlet weight (kg)	White Norwegian x Turcana	5	$9.99 \pm 0.76$	1.71	17.11	+ 2.38*	0.047
	Turcana	5	$2.76 \pm 0.39$	0.78	11.58		
Carcass left regions weight (kg)	White Norwegian x Turcana	5	$10.21 \pm 0.76$	1.76	17.25	+ 1.20 ns	0.250
	Turcana	5	$7.61 \pm 0.35$	0.62	8.75		

Concerning the gigot, cutlet, and gigot + cutlet weight, the hybrids recorded bigger average values compared to Turcana breed individuals, with 1.76 kg, 0.63 kg and 2.38 kg, respectively, with significant differences in hybrids' advantage.

The average values of the slaughter weight, cold carcass weight, and slaughter yield, recorded in Norwegian White x Turcana hybrids, a light superior to those reported by Dărăban, (2008) in Merino of Cluj, Tsigai and Turcana fattening young sheep. The Turcana fattened young sheep recorded smaller or similar average values compared with those reported for above mentioned breeds, mentioning that in those, the fattening interval was of 100 days, not 79 days (Dărăban, 2008; A. Pop et al., 2007).

Concerning the share of the main carcass parts (table 3), where the gigot, cutlet with or without ribs represent first quality carcass, the European Standards stipulate 56.50% share in carcass. The data obtained in our research reveal a lower share of these carcass parts both in hybrids (49.47%) and Turcana breed (45.75%).

Tab. 3

The share of the main carcass parts (%)

Trait	Breed	n	$\bar{X} \pm s_{\bar{X}}$	s	V%	Difference $\pm d$	Mann Whitney Test (p)
Gigot (%)	White Norwegian x Turcana	5	$32.71 \pm 0.21$	0.48	1.45	+ 3.54 **	0.009
	Turcana	5	$29.17 \pm 0.26$	0.59	2.02		
Cutlet (%)	White Norwegian x Turcana	5	$16.76 \pm 0.12$	0.26	1.58	+ 0.18 ns	0.465
	Turcana	5	$16.58 \pm 0.22$	0.48	2.91		
Gigot + cutlet (%)	White Norwegian x Turcana	5	$49.47 \pm 0.32$	0.72	1.45	+ 3.72 **	0.009
	Turcana	5	$45.75 \pm 0.45$	1.01	2.20		
Carcass left regions (%)	White Norwegian x Turcana	5	$50.53 \pm 0.32$	0.72	1.42	- 3.72 **	0.009
	Turcana	5	$54.25 \pm 0.45$	1.01	1.86		

In table 4 are presented the average values and variability estimates for the carcass conformational traits of the slaughtered male young sheep.

Tab. 4

The average values and variability estimates of the carcass conformation traits in slaughtered young rams

Trait	Breed	n	$\bar{X} \pm s_{\bar{X}}$	s	V%	Difference $\pm d$	Mann Whitney Test (p)
Large carcass length (cm)	White Norwegian x Turcana	5	$73.50 \pm 1.47$	3.30	4.49	+ 2.1 ns	0.601
	Turcana	5	$71.40 \pm 1.76$	3.93	5.50		
Small carcass length (cm)	White Norwegian x Turcana	5	$61.80 \pm 1.38$	3.09	5.01	+ 5.0*	0.036
	Turcana	5	$56.80 \pm 1.15$	2.56	4.51		
Gigot length (cm)	White Norwegian x Turcana	5	$28.10 \pm 0.60$	1.34	4.77	+ 0.8 ns	0.347
	Turcana	5	$27.30 \pm 0.54$	1.20	4.41		
Carcass width (cm)	White Norwegian x Turcana	5	$22.30 \pm 1.09$	2.44	10.94	+ 2.4*	0.047
	Turcana	5	$19.90 \pm 0.33$	0.74	3.73		
Thorax depth (cm)	White Norwegian x Turcana	5	$26.86 \pm 0.60$	1.34	4.99	+ 1.46 ns	0.143
	Turcana	5	$25.40 \pm 0.58$	1.29	5.10		
Pelvis depth (cm)	White Norwegian x Turcana	5	$15.64 \pm 0.22$	0.50	3.18	- 2.26 ns	0.296
	Turcana	5	$17.90 \pm 1.19$	2.66	14.83		
Crupper width (cm)	White Norwegian x Turcana	5	$10.50 \pm 0.32$	0.71	6.73	+ 0.80*	0.047
	Turcana	5	$9.70 \pm 0.12$	0.27	2.82		

In all analyzed traits, the Norwegian White x Turcana hybrids recorded bigger average values compared to Turcana individuals, except the pelvis depth, where the difference is negative in advantage of the hybrids (-2.26 cm), but statistically not significant. Statistically significant differences between the hybrids average values and those of Turcana breed were recorded only in crupper width (+ 0.80 cm), carcass width (+2.4 cm) and small length of carcass (+ 5.0 cm). In other carcass conformation traits (large carcass length, gigot length, thorax depth), the differences are positive in hybrids' advantage (+ 0.8 cm to + 2.1 cm), but statistically not significant.

## CONCLUSIONS

1. Concerning the body weight, in the beginning and in the end of the fattening interval, the Norwegian White x Turcana male young hybrids recorded 1.09 kg and 3.24 kg respectively, superior values compared to Turcana young sheep, but these differences are statistically not significant.
2. Concerning the total gain and average daily gain, the hybrids recorded statistically significant differences (2.15 kg and 0.03 kg) compared to Turcana male young sheep.
3. In body weight before slaughter, cold carcass weight, slaughter yield and weight of the main parts of the carcass (gigot and cutlet), the differences between the average values of the hybrids and those of the Turcana breed are positive (0.63 kg to 5.66 kg), but significant differences are reported only for cold carcass weight, gigot weight, and cutlet + gigot weight.
4. Positive and statistically distinct significant differences (+0.18% to +3.72%) are also recorded in share of the main carcass parts (cutlet, gigot, cutlet + gigot).
5. According to the EU standards, the carcasses of the Norwegian White x Turcana hybrids frame within the category of heavy carcass weight (19–22 kg), and those of Turcana breed in category of average carcass weight (16 – 19 kg).
6. Concerning the conformational carcass traits, the differences between the average values are positive in advantage of the hybrids (+0.80 cm to 5.0 cm), but they are statistically significant only in small carcass length, carcass width, and crupper width.

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