Scientific Papers. Series D. Animal Science. Vol. LXI, Number 1, 2018
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

STUDY OF THE VARIATION OF BODY PARTS AND CARCASSES AT THE SHEEP YOUTH OF THE TSIGAI BREED AND CROSSBRED (GERMAN BLACKHEADED X TSIGAI) FATTENED IN INTENSIVE SYSTEM

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Abstract

The paper aim to present the variation of body parts and the main characteristics of carcasses obtained from sheep youth of the Tsigai breed and crossbred (German Blackheaded breed x Tsigai breed) fattened in intensive system. The intensive fattening experiment developed over a 100-day time period was performed on Tsigai young male sheep (lot 1), and young male sheep crossbred German Blackheaded (GBH) x Tsigai (lot 2). The two batches of animals subjected under fattening were made up of 12 heads each. At the end of experiment were slaughtered 5 animals from each lot. The subjective assessment of the carcasses through the SEUROP classification system after conformation and the fattening status led to framing in a superior classification of carcasses provided from the crossbreds compared to those obtained from Tsigai breed. The warm carcass weight in crossbred and Tsigai breed recorded average values of 19.04 kg at GBH x Tsigai and 16.95 kg at Tsigai breed, with distinctly significant difference to the advantage of the GBH x Tsigai (+2.09 kg, p <0.01). Also, distinctly significant differences in favor of the batch GBH x Tsigai (+2.10 kg) were recorded regarding the cold carcass weights compared with the Tsigai breed batch. Regarding the main cut sections of carcass from young sheep submitted to intensive fattening, the crossbred lot recorded greater average values (in particular in the cuts of first quality - pulp and cutlet) compared to the Tsigai breed lot. In conclusion, the assessment of the carcasses according to subjective and objective methods highlights a higher potential of meat production and of better quality at GBH x Tsigai lot, compared with the Tsigai breed lot.

Key words*: assessment, carcasses, crossbreds, German Blackheaded breed, Tsigai breed.*

INTRODUCTION

Worldwide, especially in countries with a developed animal production, the improving activity for meat production at sheep has held and continues to play a leading role. The interest in quantitative and qualitative improving of meat production at sheep has led to the creation of specialized breeds for meat production and the development of methods for the production of meat lambs and new technologies for rearing and fattening of sheep youth (Taftă, 2010).

In Romania, up to 1990, sustained efforts have been made to improve local sheep breeds in meat production direction along with the applying of advanced technologies for fattening of sheep youth (in intensive and semi-intensive system). After 1990 year the improvement of local sheep breeds for meat production is a activity limited as concern in scientific research and almost non-existent in the practice of sheep rearing.

At present, the annual consumption of sheep meat in our country is low (2.6 kg/capita), being polarized on the milk lamb during the Easter holidays and of the young sheep and the reformed adult sheep during the autumn period (MARD, 2018). The categories mentioned above in annual consumption per capita are exploited in extensive system based on cheap feed (hay and pasture grass, depending on the season) without the use of any fattening technology.

The main way to rapidly improve the growth rate and meat quality is the crossbreeding of the local sheep breeds with specialized sheep breeds for meat production (Taftă et al., 1997; Răducuță, 2010; Pădeanu, 2011).

During the last 10 years, for this purpose, the professional associations of sheep breeders from Romania, as well as the specialized universities and research centres, imported animals from specialized meat breeds from different European countries (Duman et al., 2017).

The paper aim to present the variation of body parts and the main characteristics of carcasses obtained from sheep youth of the Tsigai breed and crossbreds (German Blackheaded breed x Tsigai breed) fattened in intensive system.

MATERIALS AND METHODS

The intensive fattening experiment developed over a 100-day time period was performed on Tsigai young male sheep (lot 1), and young male sheep crossbred German Blackheaded (GBH) x Tsigai (lot 2), obtained at the Reghin Research and Development Station for Sheep and Goats in Mures County in 2016. The two batches of animals subjected under fattening were made up of 12 heads each. At the end of experiment were slaughtered 5 animals from each lot (Duman et al., 2017).

The following determinations were recorded in slaughtered young sheep: variation of body parts, live weight before slaughter, warm carcass weight, cold carcass weight and cold slaughter yield, subjective assessment of the carcasses through the SEUROP classification system after conformation and the fattening status, the main cut sections of carcass and chemical composition of meat.

The main statistical parameters were calculated (average, standard deviation, coefficient of variation, average error etc.) and the significance of differences between groups was performed by applying Student test.

RESULTS AND DISCUSSIONS

The weight of parts of the body is important in the conditions in which it provides information about phenotypic correlations, the physiological and metabolic relationships that can be established between the development and the proportion of certain parts of the body and the abilities of the sheep breeds for meat production (Răducuță and Custură, 2010).

The variation of constituent parts of body at young sheep from two batches of animals subjected under fattening are presented in Table 1. From this data it can be note that are distinctly significant differences (P<0.01) between crossbred GBH x Tsigai batch and control group (M) on live weight at slaughter, hot carcass weight and full gastrointestinal tractus, fact that highlights the superior abilities for meat production in favor of crossbreds lot.

Table 1.The variation of constituent parts of body at young sheep

Specification	Breed/Crossbred (n = 5)	$\overline{X} \pm s\overline{x}$	%
Live weight at slaughter (kg)	Tsigai GBH x Tsigai	36.80 ± 0.29 39.68 ± 0.63**	100 100
Hot carcass weight (kg)	Tsigai GBH x Tsigai	16.95 ± 0.41 19.04 ± 0.36**	46.06 47.98
Full gastro-intestinal tractus (kg)	Tsigai GBH x Tsigai	8.26 ± 0.21 9.54 ± 0.24**	22.45 24.04
Empty gastro-intestinal tractus (kg)	Tsigai GBH x Tsigai	3.94 ± 0.08 4.01 ± 0.08NS	10.71 10.11
Skin weight (kg)	Tsigai GBH x Tsigai	3.01 ± 0.13 3.42 ± 0.17NS	8.18 8.62
Head weight (kg)	Tsigai GBH x Tsigai	1.37 ± 0.01 1.40 ± 0.01*	3.72 3.53
Spleen weight (g)	Tsigai GBH x Tsigai	74.33 ± 3.14 78.60 ± 3.95NS	0.20 0.20
Pulmon weight (g)	Tsigai GBH x Tsigai	623.33 ± 23.84 670.45 ±17.18NS	1.69 1.69
Liver weight (g)	Tsigai GBH x Tsigai	842.00 ± 14.75 866.67 ± 14.12NS	2.29 2.18
Heart weight (g)	Tsigai GBH x Tsigai	227.50±5.24 236.33±6.08NS	0.62 0.60
Kidney weight (g)	Tsigai GBH x Tsigai	111.30±4.16 116.00±6.12NS	0.30 0.29
Extreme weight (kg)	Tsigai GBH x Tsigai	1.21 ± 0.02 1.33 ± 0.03**	3.92 3.35

Note: Student test: NS=not significant (p > 0.05);*=significant (p < 0.05); ** = distinctly significant (p < 0.01);***= very significant (p < 0.001).

It can also be noted that there are significant differences (P<0.05) regarding the head weight and distinctly significant differences in the weight of the extremities (P<0.01) in favor of the animals from crossbreds group, while for the other body components the differences are not significant (P>0.05).

The average values and differences concerning body weight before slaughter, warm and cold carcass weight and cold slaughter yield are presented in Table 2. Thus, the average of body weight before slaughter is for GBH x Tsigai 39.68 kg, while for Tsigai young sheep is 36.80 kg, being with about 8% higher (distinctly significant difference) in favor of crossbred lot.

The warm carcass weight in crossbreed and Tsigai breed recorded average values of 19.04 kg at GBH x Tsigai and 16.95 kg at Tsigai breed, with distinctly significant difference to the advantage of the GBH x Tsigai lot (+2.09 kg, p<0.01).

Table 2.The mean values of the carcass weight and slaughtering yield

Specification	Tsigai lot (n = 5)	GBH x Tsigai lot (n = 5)
Weight before slaughtering (kg)	36.80	39.68**
Warm carcass weight (kg)	16.95	19.04**
Cold carcass weight (kg)	16.56	18.66**
Cold slaughter yield (%)	45.00	47.03**
Note: Student test: NS=not significant (p > 0.05);*=significant (p < 0.05); ** =distinctly significant (p < 0.01);***= very significant (p < 0.001).		

Also, distinctly significant differences between a group of GBH x Tsigai (+2.10 kg) were recorded regarding the cold carcass weights compared with the Tsigai breed lot. Regarding cold slaughter yield, distinctly significant differences (p<0.01) were recorded between crossbred lot and the Tsigai breed lot, being with 2 procentual points higher in the advantage of crossbred lambs.
Concerning the pulp, cutlet, shoulder + arm and carcass rest, the results are presented in Table 3.

Table 3.The main cut sections of carcass from young sheep submitted to intensive fattening

Specification	Tsigai lot (n = 5)	GBH x Tsigai lot (n = 5)
Cold carcass weight (kg)	16.56 ± 0.44	18.66 ± 0.38**
Pulp (kg)	5.16 ± 0.25	6.29 ± 0.22**
Cutlet (kg)	2.72 ± 0.09	3.08 ± 0.03**
Shoulder + arm (kg)	2.94 ± 0.13	3.43 ± 0.12*
Carcass rest (kg)	5.74 ± 0.15	5.86 ± 0.08 NS
Note: Student test: NS=not significant (p > 0.05);*=significant (p < 0.05); ** = distinctly significant (p < 0.01);***= very significant (p < 0.001).		

The crossbred lot recorded greater average values compared to the Tsigai pure breed lot. The values obtained for the GBH x Tsigai lot are distinctly significant (p<0.01) compared to Tsigai breed lot in the case of pulp and cutlet parts, while for shoulder+arm part the differences recorded were significant (p< 0.05) and for the carcass rest differences are not significant (p > 0.05).
The same conclusion is released from Figure 1, where are presented the percentages held by the main cut sections from the total of carcass. Thus, for the crossbred lot GBH x Tsigai the pulp section holds 33.71% of the total carcass while for the Tsigai breed lot only 31.16%.

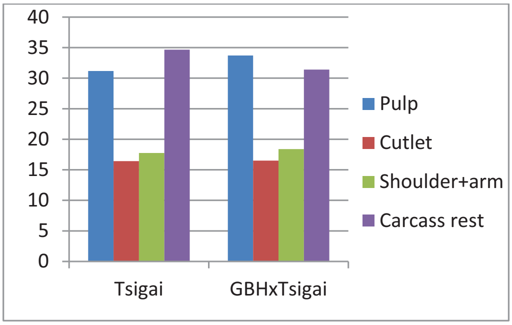

Figure 1. The main cut sections of carcass (%)

It is also worth to be mention the share held by the carcass rest section at the two lots, namely from these data it can be noticed that the inferior quality meat has a lower weight at the crossbred group (31.4%), compared to the Tsigai breed lot (34.66 %).
In Table 4 is presented the assessment of the carcasses through the SEUROP classification system after conformation and the fattening status.

Table 4. Assessment of the carcasses through the SEUROP classification system after conformation and the fattening status

Specification		Genotype			
		GBH x Tsigai		Tsigai	
		Number of carcasses	%	Number of carcasses	%
Class after conformation	S	-	-		
	E	-	-		
	U	-	-		
	R	5	100	2	40.0
	O	-	-	3	60.0
	P	-	-	-	-
	Total	5	100	5	100
Class by degree of fattening	1	-	-	-	-
	2	-	-	-	-
	3	5	100	3	60.0
	4	-	-	2	40.0
	5	-	-	-	-
	Total	5	100	5	100

From the data provided in Table 4, at the crossbred group the assessment according to the carcass conformation reveals that all 5

carcasses are classified in class R (100%), while in the control group 40% of the carcasses are classified in the R class and 60% in class O. This fact leads to the conclusion that the carcasses obtained from the control group are inferior to those obtained from crossbreds.
The same conclusion is highlighted after the assessment according to the degree of fattening, respectively all 5 carcasses obtained from crossbreds batch are classified in class 3, while in the case of witness batch 60% are classified in class 3 and 40% in class 4, with more fat cover. These results confirm the data from other research papers met in speciality literature (Ilişiu, 2009).
In Table 5 and Figure 2 is presented the chemical composition of meat.

Table 5. The chemical composition of meat (%)

Specification	GBH x Tsigai lot	Tsigai lot
Dry matter	27.40 ± 0.52	26.07 ± 0.34
Water	73.60 ± 0.80	74.00 ± 0.52
Protein	20.15 ± 0.40	19.00 ± 0.72
Fat	6.10 ± 0.17	5.80 ± 0.44
Ash	1.17 ± 0.38	1.13 ± 0.17

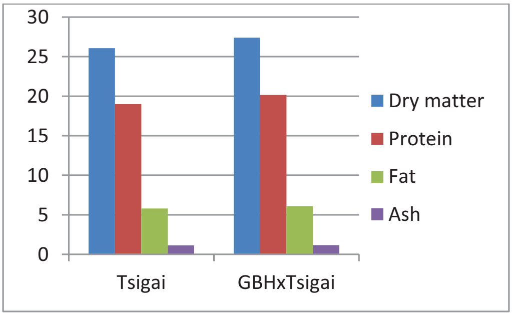

Figure 2. The chemical composition of the meat (%)

From this data can note that meat obtained from crossbred lot has the dry matter and protein content with 5.1% respectively 6.1% higher than those from meat obtained from Tsigai lot, fact which lead at the conclusion that meat provided by crossbred batch has a superior quality.

CONCLUSIONS

The variation of constituent parts of body reveals distinctly significant differences (P<0.01) between crossbreds GBH x Tsigai batch and control group on live weight at slaughter, hot carcass weight and full gastrointestinal tractus, fact that highlights the superior abilities for meat production in favor of crossbreds lot.
The share of cuts meat of best quality is higher in the case of the crossbred lot and also the share of cuts meat of inferior quality is lower compared with Tsigai lot.
Assessment of the carcasses through the SEUROP classification system leads to the conclusion that the carcasses obtained from the crossbred lot are superior to those obtained from control group.

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