Morpho-productive characterization of a Tsigai breed sheep stock

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Abstract. The dual purpose Tsigai sheep breed with its high overall mixed operating capacity confer farmers a major advantage for an efficient capitalization of the meat and milk production. The aim of the present paper is to highlight in a comparative manner the differences between conformation traits, body mass and wool production for the breed two varieties, the black face and the red face variety respectively. The studied animals originated from a Tsigai stock from Cluj County. In respect of the most measurements of conformation there was observed superiority in favor of the black face variety, without statistical differences. The same significant differences are found in the body weight of lambs at birth and weaning. In contrast the ewe lambs at the age of six months and the breeding sheep category show very significant differences in the favor of the black face variety. Analyzing the wool production of the two varieties, there is no statistically significant differences.
Key Words: Variety, red face, black face, conformation, dual purpose breed.

Rezumat. Rasa Țigaie, care are o direcție de exploatare mixtă și o capacitate combinativă generală și specială mare, conferă crescătorilor de ovine un avantaj major în vederea valorificării eficiente pentru producția de carne și lapte. Scopul urmărit este de a evidenția într-un mod comparativ diferențele existente între cele două varietăți ale rasei Țigaie, varietatea bucălaie și varietatea ruginie pentru însușirile de conformație, masă corporală și producția de lână. Materialul biologic este reprezentat de o populație de ovine din rasa Țigaie din județul Cuj. În privința majorității măsurătorilor de conformație se constată o superioritate în favoarea varietății bucălaie fără ca diferențele să fie asigurate statistic. Aceleași diferențe nesemnificative se regăsesc și în cazul greutății corporale a mieilor la naștere și la înțărcare. În schimb la vârsta de șase luni la mioare și la oi mame există diferențe distinct semnificative în favoarea varietății bucălaie. Producția de lână nu prezintă diferențe semnificative statistic, la cele două varietăți de ovine.
Cuvinte cheie: Varietate, ruginie, bucălaie, conformație, Țigaie.

Introduction. Worldwide the general trend of the sheep breeders is mainly directed towards the production of meat and secondary to the milk production (Oroian et al 2009). Given these two general international trends, the sheep breeders in our country also follow this direction.

The Tsigai sheep breed stock is large enough, and with its dual purpose operating capacity, beside its good combination capacity, gives to the breeders from our country a major advantage for the efficient capitalization of this biological resource (Grosu et al 2005).

The aim of the present study is to highlight differences regarding some conformation traits, body weight and wool production between the two Tsigai variety, black face and red face through a comparative study.

Material and Method. The Tsigai subjects of this study is part of a population with a total of 325 individuals, which of 200 are breeding sheep, 120 individuals belonging to the red face variety, and 80 individuals belonging to the black face variety.

The population on which we extended our study belongs to a small family farms in Geaca village, Cluj county and is raised in the specific climate and food conditions of the region.

To analyze the conformational aspects we considered body measurements performed on individuals on the breeding sheep category of the two varieties (Pop 2012).

The conformation traits which make the subject on this category are: withers height, croup height, body length, chest depth, chest breadth, thoracic perimeter and tibia perimeter (Pop 2012).

Body weight is assessed at different stages of ontogenetic development: the lambs of both sexes and varieties at birth, at weaning (80-90 days), at 6 months, and at the ewe lambs and breeding sheep category at the time of trimming operation.

Analysis of wool production have been performed it through the quantitative values recorded at trimming for the ewe lambs and breeding sheep categories.

The study for setting characteristics nominees was conducted on a total of 25 animals per each experimental variant (Pop 2012).

The sample which made the subject of the study was extracted from randomized from the population; size of settling was performed considering the existing variability in the population for the specific trait, so as to be representative for the population (Cighi 2008).

The raw data were processed statistically using student test (t), estimating averages, dispersion indices, the differences between the experimental variants and their statistical significance (Cighi 2008).

Results and Discussion. The Table 1 presents the average values, dispersion indices, the differences between the mean values and their statistical significance for the main conformation traits for breeding sheep category including the both varieties of the Tsigai breed.

Table 1

Statistics for the main conformation traits for the Tsigai breeding sheep stock

Character	*Variety*	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
Withers height	B	25	58.80±0.65	10.75	5.47	0.68	0.83	ns
	R	25	59.48±0.48	5.87	4.07			
Croup height	B	25	59.80±0.65	10.75	5.48	0.68	0.83	ns
	R	25	60.48±0.48	5.87	4.00			
Body length	B	25	67.48±0.87	19.21	6.49	1.92	1.61	ns
	R	25	65.56±0.80	16.12	6.11			
Chest depth	B	25	28.00±0.36	3.25	6.42	0.40	0.82	ns
	R	25	28.40±0.32	2.67	5.73			
Chest breadth	B	25	17.68±0.27	1.92	7.80	0.28	0.77	ns
	R	25	17.40±0.23	1.38	6.60			
Thoracic perimeter	B	25	81.20±0.98	24.50	4.88	1.12	0.85	ns
	R	25	80.08±0.86	18.50	4.29			
Tibia perimeter	B	25	7.44±0.12	0.38	8.33	0.20	1.09	ns
	R	25	7.24±0.13	0.46	9.36			

B – black face, R - red face, n – measurements, ns – statistically non significant.

Mathematically the differences between mean values of the two varieties for characters as withers height and rump height are small (0.68 cm) in behalf of the red face variety in the case of the first character in favor of the black face variety for the second character having no statistical coverage for none of the three thresholds of significance (0.05; 0.01; 0.001). According to our research variability estimated by the coefficient of variation (V%) for the mentioned characters ranged between 4.00-5.47%. Miclea et al (2009) reported 52-68 cm and 54-71 cm respectively for the same characters.

Regarding body length the black face variety registered an average value of: 67.48±0.87 cm with 1.92 cm more than the red face variety, the differences are not statistically significant. Variability coefficient values for this trait are 6.49% for the black face variety and 6.11% for the red face variety. Miclea et al (2009) recorded values ranging between 59-71 cm for this trait.

The average values for chest depth recorded for the two varieties are close, 28.00 cm for the black face and 28.40 cm for the red face variety, the 0.40 cm difference is not

statistically significant. Variability is in line with the above described traits: 6.42% in the case of the black face variety and 5.73% in the case of the red face variety respectively.

A small difference between varieties 0.28 cm is recorded for chest width, with a slight superiority for the black face variety is not statistically significant.

The same trend of slight superiority for the black face variety occurs in the thoracic perimeter, with 1.12 cm in advantage. The coefficient of variation recorded fall within the values of: 4.88% and 4.29% indicating a good uniformity of the studied biological material for this trait. Miclea et al (2009) displayed values between 73-93 cm for a sheep herd from Jucu SCDP (Cluj County, Romania) and values of 90-98 cm for a population from the Turda Research Resort (Cluj County, Romania).

The average values of tibia perimeter, which gives us information upon the skeleton structure, are in accordance with those provided by the literature in this domain: 7.44 cm for the black face variety and 7.24 cm for the red face variety.

The difference is statistically insignificant, variability of the trait falling under the same quota like all traits analyzed, which proves again homogeneity of the studied biological material.

Summarizing those analyzed so far on our stock sample, we find on aspects of conformation that: withers height, croup height and chest depth have the highest scores for sheep from the red face variety against those from the black face variety, the differences are insignificant in terms of statistical analysis. Mean values for the body length, chest width, chest perimeter, and tibia perimeter are superior, and in advantage of the black face variety but statistically these differences are insignificant.

The studied population showed average values inferior for the most body traits compared to the average values for the same traits found in the literature. Other sources reported for conformation traits the following values for the breeding sheep category: withers height 86.22±0.12 cm, croup height 69.60±0.12 cm, body length 71.81±0.32 cm, chest width 19.52±0.37 cm, chest perimeter 104.73±0.22 cm, and 8.63±0.07 cm for tibia perimeter (Daraban 2006).

This situation may be due to a weak nutritional factor level (poor pasture quality during the grazing period in the summer, and an unbalanced ration for the stalling period).

In Table 2 are presented the results for body weight recorded at birth for both varieties and both sexes.

Average body weight of male lambs at birth is 4.04 kg f torhe black face variety, and 3.84 kg for the red face variety respectively. The difference of 0.2 kg in the black face variety advantage is not statistically significant.

Also the differences between the average body weights of female lambs at birth are small, in the favor of the black face variety.

Compared with data find in literature our recorded values are approximately equal. Daraban (2006) presents average value for this character of 3.86±0.3 kg.

Table 2

Differences between mean values of body weight of lambs at birth and their statistical significance

Variety	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
			Males				
Black face	25	4.04 ± 0.057	0.32	14.10	0.2	0.52	ns
Red face	25	3.84 ± 0.056	0.31	14.49			
			Females				
Black face	25	3.62 ± 0.051	0.25	14.02	0.09	0.58	ns
Red face	25	3.53 ± 0.058	0.34	16.56			

n – measurements, ns – statistically non significant.

The results regarding records representing the body weight of lambs at weaning age are displayed according gender and varieties in Table 3.

Table 3

Differences between mean values of body weight of lambs at weaning and their statistical significance

Variety	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
			Males				
Black face	25	21.65±0.189	3.60	8.76	0.77	1.34	ns
Red face	25	20.88±0.215	4.63	10.30			
			Females				
Black face	25	19.67±0.239	5.73	12.16	0.70	1.09	ns
Red face	25	18.97±0.213	4.55	11.24			

n – measurements, ns – statistically non significant.

Between the two varieties there is a difference of 0.77 kg in male lambs and 0.70 kg in female lambs respectively, with higher values for the black face variety. Statistically the differences are insignificant.

The superior values recorded at black face lambs compared with those derived from the red face variety can be due to the fact that females from the black face variety has higher milk yield.

The mean values of body weight for the young stock at six months of age, dispersion indices and the significance of differences between varieties are shown in Table 4.

Table 4

The mean values of body weight for the six months old young stock and their statistical significance

Variety	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
			Males				
Black face	25	35.36±0.184	3.40	5.36	1.48	2.77	**
Red face	25	33.88±0.192	3.70	5.68			
			Females				
Black face	25	33.24±0.208	4.34	6.43	1.39	2.34	**
Red face	25	31.85±0.211	4.49	6.62			

n – measurements, ** - significant at P≤0.01.

Data analysis of this table shown that both males and females lambs of the black face variety recorded higher average body weight values than the youngs of the red face variety, higher with 1.48 kg in males and 1.39 kg in females. Differences between the two varieties being statistically distinctly significant (P≤0.01).

Mean differences between these values, dispersion indices for body weight for ewe lambs and breeding sheeps are presented in Table 5.

Table 5

Differences between mean values of body weight of ewe lambs and breeding sheeps and their statistical significance

Variety	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
			Ewe lambs				
Black face	25	38.81±0.146	2.12	3.75	1.26	2.35	**
Red face	25	37.55±0.225	5.07	5.99			
			Breeding sheep				
Black face	25	39.72±0.164	2.69	4.16	0.91	2.141	*
Red face	25	38.81±0.135	1.84	3.49			

n – measurements., * - significant at P ≤ 0.05, ** - significant at P≤0.01.

Regarding body weight, between the two varieties and age categories: ewe lambs and breeding sheeps there are differences of 1.26 kg and 0.91 kg respectively in the advantage of the black face variety. Statistically there are distinctly significant differences showed between ewe lambs and significant differences between breeding sheeps (Table 5).

The values recorded regarding body weight in the in ewe lambs which approaching the size of the recorded values in breeding sheeps, can be due to the fact that to this category was given a more special attention in terms of maintenance and feeding technology. Miclea et al (2009) reported a mean body weight for breeding sheep of 38.67±0.14 kg and an average value of 33.01±0.28 kg for ewe lambs.

The wool production level at ewe lambs and breeding sheep category is presented in Table 6.

Table 6

The differences between the mean values of the wool production and their statistical significance

Variety	*n*	$\acute{x} \pm s_x$	s^2	*V%*	*d*	*t*	*Significance*
Ewe lambs							
Black face	25	3.30±0.028	0.08	8.55	0.33	0.45	ns
Red face	25	3.63±0.041	0.17	11.30			
Breeding sheep							
Black face	25	3.22±0.051	0.26	15.87	0.16	0.167	ns
Red face	25	3.38±0.066	0.44	19.52			

n – measurements, ns – statistically non significant.

Data presented in Table 6 reveals that there are no statistic differences regarding the values recorded for wool production for the two age categories and genetic structures (black face Tsigai and red face Tsigai).

Conclusions. The mean values of withers height, croup height, and chest depth are higher in the red face Tsigai sheeps compared to the black face variety, but no significant differences in terms of statistically analyzes.

Mean values for the body length, chest width, chest perimeter and tibia perimeter are higher in the favor of the black face variety compared to the red face variety, but the significant differences in terms of statistically analyzes.

Male and female lambs of the black face variety exhibit higher average body weight at birth, at weaning, and also at 6 months of age than those of the red face variety.

According mean body weight recordings at ewe lambs and breeding sheeps category, the measurements show higher values in favor of the individuals belonging to the black face variety.

Our findings regarding the values of the wool production measurements from the ewe lambs and breeding sheeps shows no significant differences between the two variety of the breed.

The existence of an acceptable level of variability within the population offers the possibility of providing a genetic progress by using the pure breed selection based on family lines.

In order to benefit from the capitalization of the heterosis effect, given to the combination ability of the Tsigai breed, we recommend to use this well consolidated breed in economic purposes crosses with other breeds, in order to improve farms performances in terms of production and implicit economically.

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