MORPH-PRODUCTIVE CHARACTERS OF THE PRECURSORS OF THE NEW ROMANIAN SHEEP BREEDS FOR THE MEAT PRODUCTION

Camelia Zoia Zamfir[1*], G. Vicovan[1], R. Radu[1], V. Rău[1], Carmen Ana Pivoda[1]

[1] *Institute of Research-Development for Sheep and Goat Breeding Palas-Constanţa, Romania*

Abstract

Aiming to create some Romanian breeds which are specialized for the meat production, well adapted to the environment conditions from Romania two populations of half-breeds were created: at ICDCOC Palas-Constanţa Suffolk x Merinos of Palas and Texel x Meat Breed Palas and at SCDCOC Reghin-Mureş German with Black Head x Ţigaie. The morph - productive parameters of the F1 half-breeds were: F_1 Suffolk x Merinos of Palas half-bred rams reached an average living weight of 109.86 kg, having an average production of wool of 6.47 kg, with the length of the tufts of 7.71 cm and the finesse of the fibers of 23.71 microns; the rams of Merinos of Palas (the control lot) had the body weight of 89.5 kg, the quantity of wool being of 9.10 kg, with the length of the tufts of 10,33 cm and the finesse of 21.33 microns; the half-bred rams of Texel x Meat Breed of Palas reached an average living weight of 103.00 kg, having an average production of wool of 3.90 kg, with the length of the tufts of 8.80 cm and the finesse of the fibers of 23.00 microns; the rams from the Meat Breed of Palas (control lot) had the body weight of 95.23 kg, the wool quantity being of 3.88 kg, with the length of the tufts of 8.40 cm and the finesse of 22.23 microns; the half-bred rams of F_1 German with Black Head x Ţigaie had, after hair-cutting, the body weight of 72.50 kg, the value being intermediary between the rams of German with Black Head breed which had 93.33 kg and the rams of Ţigaie with 68.57 kg; the quantity of physical wool was of 3.83 kg, at the F_1 half-bred rams, comparatively to 4.43 kg at the rams of German with Black Head breed and 3.34 kg at the rams of Ţigaie breed.

Key words: half-breeds, meat, precursors

INTRODUCTION

The increase of the meat production and its qualitative improvement was and remains the main direction of the activity of sheep breeding in the countries from European Union. In countries as Great Britain, France and Spain which are leaders in sheep meat production many half-breeds (hybrids) specialized for meat production, well adapted at the environment conditions were created. Also in Romania researches regarding the meat production at the local sheep breeds and the half-breeds with meat breeds [3] and [8] were developed.

Aiming to make some Romanian breeds of sheep specialized for the production of meat, well adapted to the environment conditions from Romania, three populations of half-breeds were created: at ICDCOC Palas-Constanţa Suffolk x Merinos of Palas and Texel x Meat Breed Palas and at SCDCOC Reghin-Mureş German with Black Head x Ţigaie. The populations of half-breeds will be used at making the half-breeds of the „desired type" (the „desired type" for the meat breed well adapted at the environment conditions from Dobrogea and the field areas is represented by the obtained F_3 half-breeds, which will have in their genome: 25% genes from Suffolk breed, 25% from Texel breed, 25% from Merinos of Palas and 25% from Meat Breed-Palas, and the sheep of the „desired type" for the areas of plateau and sub-Carpathians, obtained by the reproduction of R_1 half-breeds will have in their genome: 75% genes from the German with Black Head breed and 25% genes from Ţigaie).

MATERIAL AND METHODS

The researches were developed on sheep effectives from the **Institute of Research-Development for Sheep and Goat Breeding Palas-Constanța** (F_1 Suffolk x Merinos half-breeds and the witness lot of sheep of Merinos de Palas breed and F_1 Texel x Meat Breed half-breeds and the witness lot of sheep of Meat Breed Palas**)** and at the **Station of Research-Development for Sheep and Goat Breeding Reghin-Mureș** (F_1 German with Black Head x Țigaie half-breeds and the witness lot of sheep of Țigaie breed**).**

The morph-productive parameters used to characterize the populations are the body weight, the quantity of the cut wool, the length of wool tufts, the finesse of fibers and ten body dimensions (height at withers, height at croup, the length of body, the length of croup, the width at shoulders, the width at the hip-femur articulations, the depth of thoraces, the width of thoraces, the thoracic perimeter and the perimeter of the shinbone).

The body weight was registered individually, after cutting with a precision of ± 1 kg. The body dimensions of height and length were measured with the zoo-meter, the dimensions of width and depth with the compass, and the perimeters with the tailoring tape. For the aim of the project, from the ten body dimensions, more important to be noted are the width at shoulders, the width at the hip-femur articulations, the body length, such features at the meat breeds being very correlated to the degree of the development of muscles in the regions of shoulders, back and mutton's leg, on which depending the classification in the quality

standards of the carcasses after the European grid of classification.

The individual quantity of wool was registered after cutting with a precision of ± 0.1 kg, The length of the wool tufts was measured at bonneting in the region of shoulders with the scaled ruler; it was determined the macroscopic finesse of the wool fibers at shoulders.

The obtained data were statistically processed, the differences between lots being interpreted through Fisher test (the analysis of the variance) [6].

RESULTS AND DISCUSSIONS

The main morph-productive parameters of the three populations of half-breeds: Suffolk x Merinos of Palas, Texel x Meat Breed of Palas and German with Black Head x Țigaie were had in view. The morph-productive parameters of the F1 Suffolk x Merinos of Palas half-breeds comparatively to the Merinos of Palas are presented in table 1. In table 1 it can be noted that the half-bred rams achieved an average living weight of 109.86 kg, having a wool production of 6.47 kg, with the length of tufts of 7.71 cm and the finesse of fibers of 23.71 microns. The rams of Merinos of Palas (witness lot) had the body weight of 89.5 kg, the quantity of wool being of 9.10 kg, with the length of length of the tufts of 10.33 cm and the finesse of 21.33 microns. The half-bred rams of F_1 Suffolk x Merinos of Palas surpass the rams of Merinos of Palas breed regarding the body weight, the difference being statistically very significant (p<0.001).

Table 1 The morph-productive indicators at the F_1 Suffolk x Merinos of Palas rams comparatively to Merinos of Palas

Nr.	Breed	Body weight (kg)		Quantity of physical wool (kg)		Length of wool tufts (cm)		Finesse of wool fibers at shoulders (microns)	
		X ± sx	V%	X ± sx	V%	X ± sx	V%	X ± sx	V%
1.	F_1 Suffolk x Merinos of Palas	109.86± 3.85	9.27	6.47± 0.50	20.53	7.71± 0.48	16.68	23.71± 1.08	12.10
2.	Merinos of Palas	89.50± 2.88	13.7	9.10± 0.23	11.00	10.33± 0.52	21.51	21.33± 0.16	3.22

The half-breeds of F_1 Suffolk x Merinos of Palas have a smaller production of wool, the length of tufts smaller and the finesse of fibers bigger, comparatively to the Merinos of Palas (table no 1), the differences between the half-breeds and Merinos of Palas were significant in the statistic point of view.

In table 2 the average values of the body dimensions at the F_1 rams comparatively to Merinos of Palas are presented. From the data in the table it results that the half-bred rams, six of the ten studied body dimensions were bigger comparatively to those of the rams Merinos of Palas.

Table 2 Main body dimensions at the rams of F_1 Suffolk x Merinos comparatively to Merinos of Palas

Nr.	Body dimensions	UM	Breed			
			F_1 Suffolk x Merinos		Merinos of Palas	
			X ± sx	V%	X ± sx	V%
1.	Height at withers	cm	76.00±1.0465	3.64	70.11±0.7207	5.34
2.	Height at croup	cm	75.86±0.9368	3.27	71.11±0.6884	5.03
3.	Length of body	cm	82.43±1.4938	4.79	75.26±0.9407	6.49
4.	Length of croup	cm	29.14±0.1429	5.40	25.96±0.4151	8.31
5.	Width at shoulders	cm	29.14±0.3401	3.09	23.66±0.3418	7.50
6.	With at hip-femur articulations	cm	30.14±0.4595	4.03	24.59±0.4074	8.60
7.	Depth of thorax	cm	36.57±0.4286	3.10	34.15±0.6509	9.90
8.	Width of thorax	cm	32.14±0.6335	5.21	30.33±0.5284	9.05
9.	Thoracic Perimeter	cm	102.14±1.5028	3.89	100.74±0.9646	4.98
10.	Perimeter of shinbone	cm	11.50±0.4082	9.39	11.30±0.2376	10.93

From table 2 it can be noted that the height at withers of the half-breeds was of 76 cm besides 70.11 cm at Merinos of Palas; the height at croup was of 75.86 cm at the half-breeds besides 71.11 cm at Merinos; the length of body was at the half-breeds of 82.43 cm besides 75.26 cm at Merinos of Palas; the width at shoulders was of 29.14 cm at the half-breeds comparatively to only 23.66 cm at Merinos of Palas, the width at the hip-femur articulations at the half-bred rams was of 30.14 cm besides only 24.59 cm at Merinos of Palas; the thoracic perimeter half-breeds was of 102.14 cm besides 10.74 cm at Merinos of

Palas; the perimeter of shinbone at half-breeds was of 11.50 cm besides 11.30 cm at Merinos of Palas.

In table 3 the differences between the half-breeds of F_1 Suffolk x Merinos of Palas and Merinos of Palas are presented.

From the data presented in table 3 it results that the differences between the half-breeds of F1 Suffolk x Merinos of Palas and Merinos of Palas were very significant regarding the height at withers and at croup, the length of body, width at shoulders and at the hip-femur articulations.

Table 3 Body dimensions differences at F_1 Suffolk x Merinos rams comparatively to Merinos of Palas

Nr.	Dimension	Differences between F_1 Suffolk x Merinos and Merinos of Palas		
		± cm	± %	Signification of differences
1.	Height at withers	+ 5.85	+ 8.40	p < 0.001
2.	Height at croup	+ 4.75	+ 6.68	p < 0.001
3.	Length of body	+ 7.17	+ 9.53	p < 0.001
4.	Length of croup	+ 3.18	+ 12.24	p < 0.001
5.	Width at shoulders	+ 5.48	+ 23.16	p < 0.001
6.	With at hip-femur articulations	+ 5.55	+ 22.57	p < 0.001
7.	Depth of thorax	+ 2.35	+ 6.88	p > 0.05
8.	Width of thorax	+ 1.81	+ 5.97	p > 0.05
9.	Thoracic Perimeter	+ 1.4	+ 1.39	p > 0.05
10.	Perimeter of shinbone	+ 0.20	+ 1.77	p > 0.05

The differences of width and depth of thorax and the perimeters of thorax and shinbone were not significant.

In table 4 the values of the morph-productive indicators at F_1 ram of Texel x Meat Breed are presented.

Table 4 Morph-productive indicators at the F_1 rams of Texel x Meat Breed -Palas comparatively to the Meat Breed - Palas

Nr.	Breed	Body weight (kg)		Quantity of physical wool (kg)		Length of wool tufts (cm)		Finesse of wool fibers on the back (microns)	
		X ± sx	V%	X ± sx	V%	X ± sx	V%	X ± sx	V%
1.	F_1 Texel x Breed de Meat	103.00 ± 3.1464	6.83	3.90 ± 0.2898	16.62	8.80 ± 0.3391	8.62	23.00 ± 0.7746	7.53
2.	Breed de Meat-Palas	95.23± 1.1732	6.28	3.88 ± 0.0971	12.75	8.40 ± 0.2337	14.18	22.23 ± 0.1961	2.93

From the data of the table it results that the half-bred rams had the body weight of 103 kg besides 91.62 kg at the rams of Meat Breed. Regarding the quantity of cut wool, this was of 3.90 kg at the half-breeds and of 3.88 kg at the rams of Meat Breed. Length of tufts was of 8.80 cm at the half-breeds and 8.40 cm at the rams of Meat Breed, and the finesse of fibers was of 23 microns at the half-breeds and of 22.23 microns at the rams of Meat Breed.

From table 5 it can be noted that regarding the body weight, the difference between half-breeds and the rams of Meat Breed was very significant in the statistic point of view, for the other studied parameters, the differences being insignificant.

In table 6 the body dimensions at the half-bred rams of F_1 Texel x Meat Breed comparatively to the rams of Meat Breed are presented.

Table 5 Differentiation of the morph-productive indicators at the rams of F_1 Texel x Meat Breed comparatively to Meat Breed –Palas

Nr.	Difference between F_1 and Meat Breed											
	Body Weight			Quantity of wool			Length of tuft			Finesse of fibers		
	± kg	± %	Signification	± kg	± %	Signification	± cm	± %	Signification	± microns	± %	Signification
1.	+ 7.77	+ 8.16	p < 0.05	+ 0.02	+ 0.52	p > 0.05	+ 0.40	+ 4.76	p > 0.05	+ 0.77	+ 3.46	p > 0.05

From the data in the table it results that the dimensions of height were similar to those of the rams from the witness lot, the height at withers being of 71.40 cm and respectively 69.94 cm, and the height at croup being of 71.40 cm and respectively 69.90 cm.

Table 6 Main body dimensions at the rams of F$_1$ Texel x Meat Breed comparatively to the Meat Breed –Palas

Nr.	Body Dimensions	UM	Breed			
			F$_1$ Suffolk x Meat Breed		Meat Breed -Palas	
			X ± sx	V%	X ± sx	V%
1.	Height at withers	cm	71.40±1.2083	3.78	69.94±0.3795	3.21
2.	Height at croup	cm	71.40±0.9798	3.07	69.90±0.3723	3.15
3.	Length of body	cm	82.30±2.1656	5.88	73.59±0.5770	4.64
4.	Length of croup	cm	28.60±1.3638	10.66	26.24±0.3256	7.34
5.	Width at shoulders	cm	30.60±0.4000	2.92	27.24±0.2973	6.46
6.	With at hip-femur articulations	cm	33.00±1.0954	7.42	29.19±0.3229	6.54
7.	Depth of thorax	cm	37.80±0.8602	5.09	33.83±0.3514	6.15
8.	Width of thorax	cm	33.20±1.4629	9.85	30.61±0.2841	5.49
9.	Thoracic Perimeter	cm	109.80±3.5270	7.18	97.20±0.8578	5.22
10.	Perimeter of shinbone	cm	10.60±0.8718	18.39	9.73±0.1091	6.64

Regarding the other dimensions they were bigger at the half-bred rams besides the rams from the witness lot. So, the length of body at the half-breeds was of 82.30 cm besides 73.59 cm at the Meat Breed; the width at shoulders was at the half-breeds of 30.60 cm besides 27.24 cm at the Meat Breed, and the width at the hip-femur articulations was of 33.00 cm at the half-breeds besides 29.19 cm at the Meat Breed.

Also, the depth of thorax had values of 37.80 cm at the half-breeds beside 33.83 cm at the Meat Breed, and the width of thorax was of 33.20 cm at the half-breeds besides 30.61 cm at the Meat Breed. The thoracic perimeter was of 109.80 cm at the half-breeds besides 97.20 cm at the Meat Breed rams.

In table 7 it is presented the signification of the differences between half-breeds and Meat Breed.

Table 7 Differentiation of body dimensions at F$_1$ Texel x Breed de Meat rams comparatively to Meat Breed – Palas

Nr.	Dimension	Differences betwen F$_1$ Texel x Meat Breed and Meat Breed -Palas		
		± cm	± %	Significance of differences
1.	Height at withers	+ 1.46	+ 2.09	p > 0.05
2.	Height at croup	+ 1.50	+ 2.15	p > 0.05
3.	Length of body	+ 8.71	+ 11.84	p < 0.001
4.	Length of croup	+ 2.36	+ 8.99	p < 0.05
5.	Width at shoulders	+ 3.36	+ 12.33	p < 0.001
6.	With at hip-femur articulations	+ 3.81	+ 13.05	p < 0.001
7.	Depth of thorax	+ 3.97	+ 11.74	p < 0.001
8.	Width of thorax	+ 2.59	+ 8.46	p < 0.01
9.	Thoracic Perimeter	+ 12.60	+ 12.96	p < 0.001
10.	Perimeter of shinbone	+ 0.87	+ 8.94	p > 0.05

It can be noted that the half-bred rams had the length of body, the width at shoulders, the width at the hip-femur articulations, the depth of thorax, the width of thorax and the thoracic perimeter significantly bigger comparatively to the rams of Meat Breed.

In table no 8 the morph-productive indicators at the rams of German with Black Head and Ţigaie breeds comparatively to the half-breeds of F1 German with Black Head x Ţigaie are presented.

Table 8 Morph-productive indicators at the from the parental breeds comparatively to the half-breeds of F_1 German with Black Head x Ţigaie

Nr.	Breed	Body weight (kg)		The quantity of physical wool (kg)	
		X ± sx	V%	X ± sx	V%
1.	German with Black Head	93.33±5.36	9.96	4.43±0.08	3.45
2.	Ţigaie	68.57±0.52	2.04	3.34±0.06	5.14
3.	F_1 German with Black Head x Ţigaie	72.50±0.71	3.14	3.83±0.03	3.03

From table no 9 it can be noted that the half-bred rams of F_1 German with Black Head x Ţigaie had the body weight of 72.50 kg, the value being intermediary between the German with Black Head breed which had 93.33 kg and the Ţigaie rams with 68.57 kg.

Table 9 Differentiation of body weight at the rams of F_1 German with Black Head x Ţigaie comparatively to the parental breeds

Differences								
Between F_1 and German with Black Head			Between German with Black Head and Ţigaie			Between F_1 and Ţigaie		
± kg	± %	Signification	± kg	± %	Signification	± kg	± %	Signification
-20.83	-22.32	p < 0.001	+24.76	+36.11	p < 0.001	+3.93	+5.73	p < 0.001

Regarding the quantity of physical wool from the same table it results that the half-bred rams had an average quantity of wool of 3.83 kg, comparatively to 4.43 kg at the rams of German with Black Head breed and 3.34 kg at the rams of Ţigaie breed.

In table no 9 it is presented the differentiation of the body weight at the rams of F_1 German with Black Head x Ţigaie comparatively to the parental breeds, German with Black Head and Ţigaie.

From the data in the table it can be noted that the half-bred rams had the body weight significantly bigger than weight of Ţigaie rams, but significantly smaller than that of the rams of German with Black Head breed.

In table 10 the differentiation of the quantity of physical wool at the rams of F_1 German with Black Head x Ţigaie comparatively to parental breeds, German with Black Head and Ţigaie.

Table 10 Differentiation of the quantity of physical wool at the rams of F_1 German with Black Head x Ţigaie comparatively to the parental breeds

Differences								
Between F_1 and German with Black Head			Between German with Black Head and Ţigaie			Between F_1 and Ţigaie		
± kg	± %	Signification	± kg	± %	Signification	± kg	± %	Signification
-0.6	-13.5	p < 0.001	+1.09	+32.63	p < 0.001	+0.49	+14.67	p < 0.001

From table it can be noted that the half-bred rams had the wool production bigger with 14.67% besides Ţigaie, the difference being very significant, but the same production was smaller with 13.50% than German with Black Head breed being also very significant for statistics.

CONCLUSIONS

On the basis of the made researches it can be concluded that the half-bred rams of F1 Suffolk x Merinos of Palas and F_1 Texel x Meat Breed Palas achieved body weights significantly bigger comparatively to Merinos of Palas breed and Meat Breed Palas.

- the differences between the half-breeds of F1 Suffolk x Merinos of Palas and

Merinos of Palas were very significant regarding the height at withers and croup, length of body, width at shoulders and at the hip-femur articulations; the differences between the dimensions of width and depth of thorax and the perimeters of thorax and shinbone were not significant.

The half-bred rams of Texel x Meat Breed Palas had the length of body, the width at shoulders, the width at the hip-femur articulations, the depth of thorax, the width of thorax and the thoracic perimeter significantly bigger comparatively to the rams of Meat Breed, the other analyzed dimensions being similar.

The half-bred rams of F_1 German with Black Head x Ţigaie had the body weight and the total production of wool significantly bigger than the rams of Ţigaie breed, but significantly smaller than the values obtained at the rams of German with Black Head breed.

REFERENCES

[1] Drăgănescu, C. – 1979- Improvement of animals. Publisher „Ceres", Bucharest

[2] Grosu Horia and Oltenacu A. Pascal – Coordonatori - 2005- Programs of genetic improvement in Animal Breeding, Publisher „Ceres", Bucharest

[3] Ionescu, A.; Ursescu, A.; Vicovan, G. - 1985 – Study regarding the use of hybridization to increase and improve the sheep productions ICPCOC Palas-Constanţa

[4] Raicohova, E.; Tudorova, L. – 1993 – Study on the possibilities of improving the carcass of lamb, in Bulgaria. FZN National Institute of Animal Science, Denmark, 16-19 august

[5] Pascal Constantin - 1998- Technoloy of sheep breeding, Corson Publisher, Iaşi

[6] Sandu Gheorghe –Experimental models in Animal Breeding, Publisher: CORAL SANIVET, Bucharest, 1995

[7] Taftă, V. – 2008 – Breeding of Sheep and Goats, Publisher „Ceres", Bucharest

[8] Vicovan, G.; Adriana Vicovan, Radu, R.; Camelia Zoia Zamfir; Sauer W.I. – 2009 – Researches regarding the improvement of the meat production at the local sheep breed by crossbreeding with the specialized breeds, A. The weight increase and the specific consumption of fodders at fattening. Scientific: "Animal Breeding and biodiversity– basis of the durable agriculture and environment protection", USAMV Bucharest

[9] *** - Strategy of Breeding and Exploiting Sheep in Romania. N.A.ANARZ, 2008.