Variation of the Surface of the L*ongissimus Dorsi* (LD) Muscle and the Section of the Leg of Mutton at Young Sheep of Different Breed Structures

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Abstract
The research was done on carcasses from the slaughter of young male sheep intensively fattened belonging to the local Tsigai race of mountain ecotype and its half-breeds with Suffolk and German blackface (GCCN). The purpose of the research was to determine Logissimus dorsi (LD) and leg of moutton area, because these parts provide information on Ist meat quality. Research results have noted that lots of half-breeds achieved higher *Longissimus dorsi* (LD) and leg of moutton area, compared with the pure breed batch. Compared with Tsigai breed, *Longissimus dorsi* (LD) area deterrmined was higher with 10,75% to Suffolk x Tsigai half-breeds, and 0,07% respectively to German Blackface x Tsigai half-breeds. Leg of moutton area was higher with 17,27% to Suffolk x Tsigai half-breeds, and 2,75% respectively to German Blackface x Tsigai half-breeds. Research carried out special information on Ist meat quality on carcass.

Keywords: half-breeds, meat, sheep, surface, young

1. Introduction

Suffolk breed is spread around the world, in countries that produce sheep meat, both by breeding in pure breed, and cross with local breeds.
High degree of acclimatization to German Blackface breed to the temperate continental environmental conditions, recommended for use in industrial crosses with our local breeds.

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The purpose of the experiment is to test the skills for meat production of Tsigai race and its hybrids with Suffolk and German Blackface, in terms under EU standards.
Longissimus dorsi muscle (LD) and leg of mutton have special importance in terms of quantity and quality, as providing Ist meat quality.

2. Materials and methods

The research was conducted at the Research and Development Station for Sheep and Goat Reghin, Mures County, on the carcasses from the slaughter

of young male sheep intensively fattened, with a period of fattening of 100 days, belonging to the local Tsigai breed of mountain ecotype and it half-breeds with Suffolk and German blackface (GCCN). For each experimental group, at the end of the fattening process, five heads were randomly selected and slaughtered, and the quality indices of carcasses and meat were determined.

After weighing each carcass at the hot and cold (for 24 hours at 2 - 4 ° C temperature), the carcasses was sectioned on the line of the backbone in two equal halves. We weighed the half carcasses, and from each half-carcass we cut the leg of mutton, coutlet, shoulder + arm, resulting the rest of carcasses.

The leg of mutton was separated by cutting the joints between vertebrae L5 and L6 and tibio-metatarsus joint. Separating the shoulder was made by cutting the muscles which provide the connection with the trunk. After separating the mutton´s leg and shoulder, the cutlet (with the L1-L5 vertebrae bone base and D6-D13) and corresponding ribs were cut up perpendicular to their axis at a distance of 10 cm from the spine axis, measured with a ruler, resulting the rest of the carcass. *Logissimus dorsi* (LD) area was determined at the last rib. Determining the leg of mutton area having as the bone basis the femur and muscle: *Rectus femoris, Vastus lateralis, Vastus intermedius* and *Sartorius* for the previous part; *Semimembranosus, Adductor, Pectineus and Gracilis* for the posterior-internal part; *Semitendinosus, Gluteus* and *Biceps femrois* for the posterior internal part, the section was executed at the half femur, perpendicular to its axis. Statistical data processing and interpretation was based on student test.

3. Results and discussion

Results obtained (table 1) show that the highest value for the surface of muscle *Longissimus dorsi* (LD) was obtained from Suffolk x Tsigai half-breeds, value very close to that of half-breeds obtained in other experiments, where specialized breeds for meat production have participated as paternal breeds. Specialized breeds for meat production, such as the Texel, Dorset, Montadale, and their F1 half-breeds with Northwestern Whiteface race had an *Longissimus dorsi* muscle area (LD) between 15.64 - 16.34 cm ², weight at slaughter was between 51.3-54.2 kg. The differences recorded were due to paternal race, feeding level was identical [1].

Table 1. Variation the surface of muscle *longissimus dorsi* (LD) and section of the leg of mutton depending on genotipe, (cm^2)

Specification	Breed/Half-breeds n = 5	$\bar{X} \pm s_{\bar{x}}$	d	t	Significance of difference
Surface of muscle *longissimus dorsi* (LD)	Ti	13.58 ± 0.34	-	-	-
	S x Ti	15.04 ± 0.17	1.460	3.842	**
	BF x Ti	13.59 ± 0.42	0.010	0.019	n.s.
Section of the leg of mutton area	Ti	112.29 ± 3.86	-	-	-
	S x Ti	131.68 ± 2.62	19.390	4.143	**
	BF x Ti	115.38 ± 5.04	3.090	0.486	n.s.

S x Ti - Suffolk x Tsigai; BF x Ti -German Blackface x Tsigai; ns - P >0.05 – insignificant;
** - P <0.01 – distinct significant

From the data of the table it is noticed that at the Suffolk x Tsigai hybrids the area of the section of the *Longissimus dorsi* muscle was of 15,04 cm^2 beside 13,58 cm^2 at the Tsigai breed, the difference of 10,75% in the favor of the hybrids being distinctly significant. At the German Blackface x Tsigai lot, the values are very close, the difference of 0,07% have not led to the registration of any significant differences.

The value of *Longissimus dorsi* muscle area (LD) to Tsigai breed at the last rib is lower than that obtained by [2], which at the young sheep Tsigai breed under intensive fattening, obtained values of longissimus dorsi muscle area (LD) situated between 14.58 - 14.67cm ².

[3] show that at Dorper breed, animals with hypertrophy genotype on muscle had an LD muscle area of 19.8 cm ², compared with the

normal genotype, when it was 14.8 cm ², approximately at the same body weight. Developing of cross of the leg of moutton, expressed by its section area – 112,29 cm ², it shows a good development, considering the fact that Tsigai breed is one mixed race. The section of the leg of mutton area at the Suffolk x Tsigai was of 131.68 cm^2 beside 112,29 cm^2 at the Tsigai breed, the difference of 17,27% in the favor of the hybrids being distinct significant. The difference of 2,75% in favor of German Blackface x Tsigai hybrids, are not significant. Comparative studies conducted in France on F1 Berrichon du Cher x Romanov and F1 Blanche Central x Romanov half-breeds, highlighted leg of moutton sectional area of 108.6 cm ² to F1 Berrichon du Cher x Romanov half-breeds, and 103.00 cm² to F1 Blanche Central x Romanov half-breeds [4].

It should be noted that Berrichon du Cher race has a good conformation, and terminal rams in this race are often used in crosses to improve skills for meat production of lambs produced in local races, that have a lower body conformation.

Simultane studies realised on animals which is of good genotypic conformation – F2 half-breeds (Belgian Texel x Romanov) x (Belgian Texel x Romanov) and animals with a conformation a less good - (Belgian Texel x Romanov) x Romanov have highlighted a very good development of leg of mouton area 141.13 cm ² to F2 half-breeds, when Texel and Romanov breeds they participated in equal proportions, and 128.8 cm ² for animals in the Romanov breed had a share of 75%, slaughter weight was similar for the two groups [4].

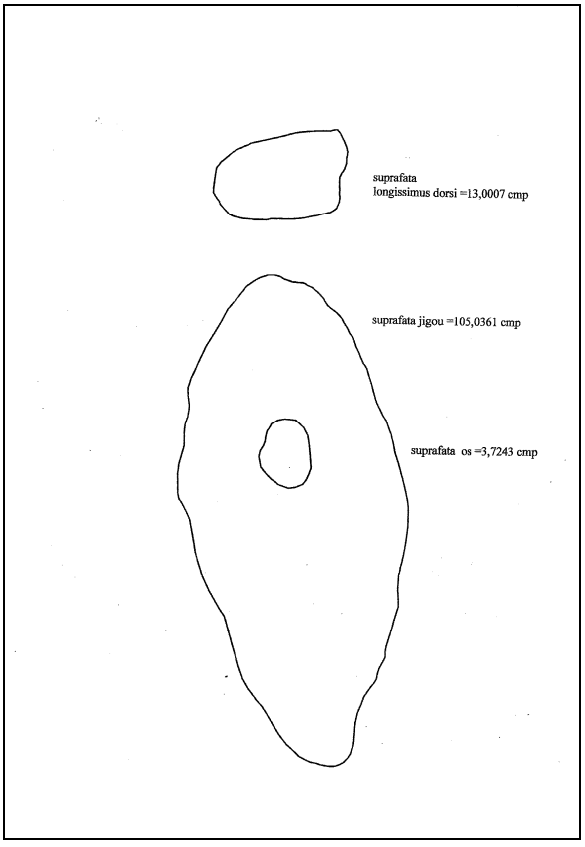

Figure 1. Surface of the muscle *longissimus dorsi* (LD) and surface the section leg of mutton area at young rams of Tsigai breed, intensive fattened

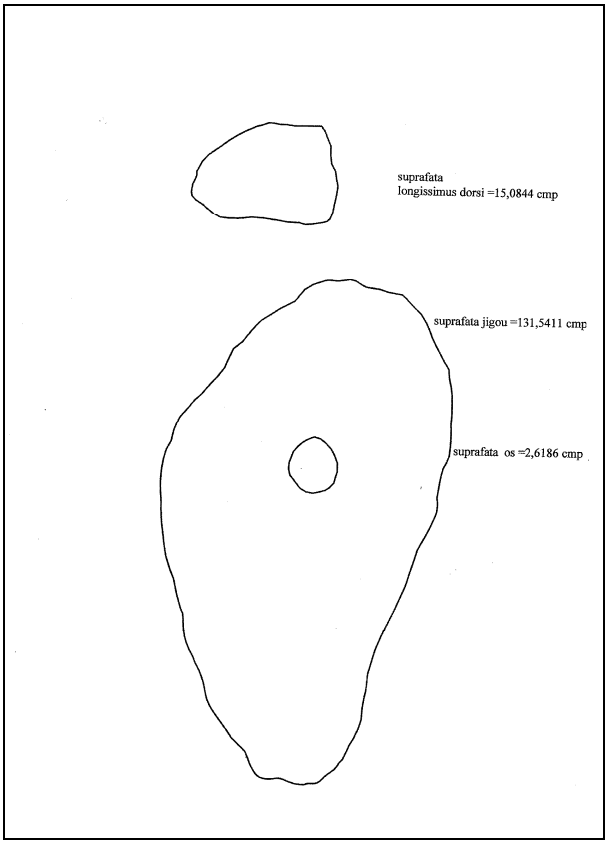

Figure 2. Surface of the muscle *longissimus dorsi* (LD) and surface the section leg of mutton at young Suffolk x Tsgai half-breeds, intensive fattened

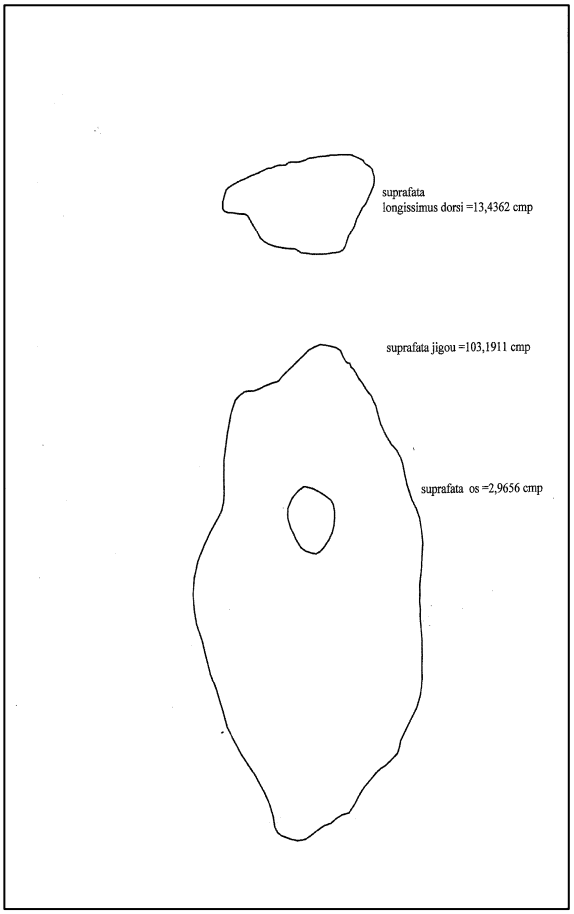

Figure 3. Surface of the muscle *longissimus dorsi* (LD) and surface the section leg of mutton at young rams of BF x Tsgai half-breeds, intensive fattened

If we compare the results obtained at Tsigai breed, and its half-breeds with Suffolk and German Blackface (figure 1, 2, 3), with those obtained by hybrids resulting from crosses between meat breeds and races with a less good conformation, we see that the obtained values are close.

Analysis of the significance of differences in the three experimental groups, show that there are distinct significant differences ($P < 0.01$) between group 1 and group 2, and significant differences ($P < 0.05$) between group 2 and 3, both the longissimus dorsi muscle (LD), and the section of leg of moutton area, differences were recorded in favor of the lot Suffolk x Tsigai.

4. Conclusions

From the presented data it resulted the fact that the F1 Suffolk x Tsigaie hybrids had a significantly higher value of the surfaces *Longissimus dorsi* muscle and the leg of moutton area, comparatively to the mother breed.

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