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### **SPECIAL FEATURES OF THE SKINS OF THE BULL CALVES OF PRECOCIOUS AND LONG GROWING MEAT SPECIES**

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*Наведено порівняльну характеристику якості шкур бичків скоростиглої абердин-ангуської і довгорослої шаролецької м'ясних порід.*

**Ключові слова:** бички, порода, вік, шкура, якість.

Each slaughter meat animal is not only a large number of high-quality beef, but a reserve of obtaining overweight hides. Bull calves of meat breeds for international recognition in this respect occupy a worthy place [1], as it is evidenced by our convincing results of research.

Production of heavy rawhide is of great economic importance. The need for it is almost 3 times higher than its harvest. In total sum of production the heavy rawhide skins are less than 5 %. Hence the high demands on the skins of cattle. It should be strong, dense, elastic. Therefore, the study of qualitative characteristics of skins from precocious and long growing meat species is very important.

Research on the quality of animal skins were performed by K. B. Svechin, O. A. Pankratov, I. I. Mikayalyan, D. L. Levantin and others. But comparative characteristics of bull calves' skins of precocious Aberdeen-Angus and long growing Charolais meat species in conditions of the steppe zone of Ukraine were carried out not enough.

In this regard, the *aim* of our study was designed for the qualitative estimation of twin skins of meat bull calves of English and French selection, which are common in Ukraine, including the steppe zone.

In farm conditions of the state enterprise "Polyvanivka" of Magdalinovka district of Dnepropetrovsk region 2 groups of 12-month-old Aberdeen-Angus bull calves (15 animals) (I group) and Charolais ones (II group) were formed, which were grown by stall-range technology to 30-months of age. Feeding took part on balanced nutritional areas. When they reached 12, 15, 18, 24 and 30 months, 3 heads were slaughtered from each group. Weight, length, width, area, thickness and chemical composition of skins were studied in the age dynamics. Process indicators of skins quality were defined in Ukrainian SRISHP.

The quality of hides depends on breed, the direction of its productivity, gender, age and technology of growing animals [2]. We found that the mass of bull calves' skins of meat breeds are more dependent on live weight and age of the animals than the level of feeding. But the role of the usefulness of the diet can not be ignored in the formation of their growth and quality. In the best feeding conditions the animals' skins are heavier and thicker, more uniform in thickness. In fed animals output of plantar skin is higher, it is suitable to screw and nail fastening.

One of the important indicators that we studied, is the weight of steamy skin (table. 1). As early as 12 months of age all the skins of bull calves of both breeds were categorized as heavy – "bull" (over 25 kg).

Natural that mass of skins correlates with habit of animals, their live weight [3, 4]. But the increase of skin weight during postembryonic period is slower than the total weight. In this regard, its relative weight to live weight of bull calves with age tends to decrease.

Charolais bull calves at all studied ages were heavier than their peers of Aberdeen-Angus breed. As early as 12 months of age mass of their skins was 11,7 %, and at 30 months of age – 14,6 % more. At little variation of skins output relatively to live weight (from 8,13 to 8,37 %) weight ratio of skins in each subsequent age period to its mass skins at 12 months of age was significant and at 15, 18, 24 and 30 months it was respectively in the first group of animals 17, 53, 63 and 82, and in the second – 29, 47, 60 and 86.

Due to the fact that Charolais bulls calves were not only heavier but also larger, then the length and breadth of their skins exceed the Aberdeen-Angus peers. The growth rate of the length of the skins from 12 to 30 months of age in both groups was the same – 12 %, but the actual measurements of the animals of the second group were more at 12, 15, 18, 24 and 30 months of age respectively by 3, 9, 12, 6 and 21 cm. A similar trend kept at the skins width. At the same growth rate from 12 to 30 months of age (15–16 %), actually 12, 15, 18, 24 and 30 months of age Charolais skins were respectively higher by 14, 8, 4, 22 and 18 cm.

The skins of Charolais bull calves were larger compared with Angus peers in the length, width and also in area at 12, 15, 18, 24 and 30 months of age, respectively, by 32, 32, 17, 60 and 84 cm. Extension skin growth confirms long growing of breed.

In each study group skins thickness with age of animals naturally and consistently increased in all standard points: during 18 months (from 12 to 30 months) it increased in the Aberdeen-Angus bull calves at the elbow by 1,9 times and in Charolais by 2,6 times, at the last rib respectively by 2,1 and 1,6 times and at the sacrum by 7,2 and 6,4 times. The thickness of the skin is not the same in different parts of the animal: on the back it is thicker than on the abdomen and the outer sides of the legs are thicker than the inside.

For the skins industry, in addition to skins measurements (length, width, area) their thickness is of particular importance [5]. It is clear that for severe plantar skin thickness plays a primary role. Purified severe skin belongs to a class shoe – it's not just for making soles, insoles and other parts of the bottom of shoes, but also for its top (thickness of 1,5–3,0 mm and OPEC – 0,5–1,5 mm). When cutting heavy hides 78 % of the area are used to obtain heavy foot and 22 % – for light sole.

Skins weight, its length, width, area and thickness characterize commodity properties, but do not define clearly the quality of hides. It is more determined by the density, structure of the dermis and other parameters that depend on the breed and age of the animals.

We studied the chemical-analytical content of skins and conducted their physical and mechanical tests and presented product and technological characteristics of bull calves at 12 months of age (table 2).

The chemical composition of the skins of bull calves from both experimental groups characterized by stability. However, we mark reduced proportion of moisture during research in the Aberdeen-Angus bulls calves by 5, and in Charolais by 8 %. On the amount of the protein the animals of the second group prevailed and on the amount of fat the bull calves from first group. Share ash grew at a slower pace.

Skins from the hides of Charolais bull calves were on the occasion of the Aberdeen-Angus fuller to the touch. On feedstock cost per unit area of finished skin, they were almost identical. But the skins from Charolais bull calves withstood more load on the cut and in presence of cracks. Their limit of elasticity and the ability to stretch and resistance to repeated bending and wet rubbing was also better.

## **Conclusions**

1. The development of specialized beef cattle in the steppe zone of Ukraine will improve the

**1. Qualitative indicators of bull calves' skins of precocious and long growing meat breeds,  $\bar{X} \pm S_{\bar{X}}$**

Indicators	Breed									
	Aberdeen-Angus, months					Charolais, months				
	12	15	18	24	30	12	15	18	24	30
Weight, kg	26,4 ± 0,9	30,9 ± 0,9	40,4 ± 1,1	43,0 ± 1,7	480 ± 2,2	29,5 ± 1,0	38,1 ± 0,9	43,3 ± 0,5	47,3 ± 0,6	55,0 ± 0,8
Length cm	194 ± 0,2	195 ± 0,7	196 ± 0,1	215 ± 0,1	219 ± 0,3	197 ± 0,2	204 ± 0,3	208 ± 0,2	221 ± 0,4	240 ± 0,6
Width, sm	170 ± 0,1	179 ± 0,8	195 ± 0,1	190 ± 0,1	196 ± 0,4	184 ± 0,9	187 ± 0,8	189 ± 0,9	212 ± 0,6	214 ± 0,7
Area, dm <sup>2</sup>	330 ± 2,1	349 ± 0,5	382 ± 2,2	408 ± 2,7	429 ± 2,4	362 ± 0,4	381 ± 0,4	399 ± 0,2	468 ± 0,5	513 ± 0,6
Thickness, mm:										
in the elbow	3,5 ± 0,3	4,0 ± 0,3	4,7 ± 0,2	5,3 ± 0,2	6,6 ± 0,4	2,8 ± 0,1	4,1 ± 0,3	5,6 ± 0,3	6,5 ± 0,2	7,3 ± 0,4
at the last rib	2,9 ± 0,1	4,1 ± 0,4	4,3 ± 0,3	5,5 ± 0,1	6,0 ± 0,3	3,9 ± 0,4	5,5 ± 0,3	5,6 ± 0,4	5,8 ± 0,3	6,4 ± 0,3
on the sacrum	5,0 ± 0,3	5,9 ± 0,4	6,8 ± 0,9	8,6 ± 0,8	8,6 ± 0,7	5,6 ± 0,2	7,1 ± 0,3	8,1 ± 0,4	8,8 ± 0,5	9,2 ± 0,6
Chemical composition, %:										
moisture	71,1 ± 0,4	69,4 ± 0,6	68,7 ± 0,5	66,2 ± 0,7	65,8 ± 0,6	74,1 ± 0,7	72,6 ± 0,8	70,4 ± 0,4	68,3 ± 0,6	66,0 ± 0,8
protein	23,2 ± 0,1	24,4 ± 0,3	25,8 ± 0,2	26,1 ± 0,3	26,9 ± 0,3	22,8 ± 0,3	24,2 ± 0,3	24,5 ± 0,1	26,1 ± 0,1	27,0 ± 0,1
fat	1,5 ± 0,1	1,8 ± 0,1	2,3 ± 0,2	2,8 ± 0,2	3,0 ± 0,3	1,2 ± 0,1	1,5 ± 0,1	1,8 ± 0,1	2,0 ± 0,4	2,4 ± 0,5
ash	0,3 ± 0,01	0,5 ± 0,02	0,7 ± 0,02	0,8 ± 0,03	0,9 ± 0,03	0,4 ± 0,5	0,5 ± 0,03	0,6 ± 0,03	0,7 ± 0,03	0,9 ± 0,05

**2. The cost of raw materials and skins quality for shoe uppers,  $\bar{X} \pm S_{\bar{X}}$**

Indicators	Unit of measure	Breeds	
		Aberdeen-Angus	Charolais
The cost of raw materials for 100 m <sup>2</sup> of finished skins	kg	781,4	786,9
Loading:			
on incision	9,8 МПа	23,9 ± 2,9	28,8 ± 3,1
if there are cracks	9,8 МПа	20,4 ± 2,3	22,3 ± 2,7
The limit of elasticity	9,8 МПа	1,69 ± 004	1,73 ± 009
Stretching	%	59,9	63,5
Resistance to:			
repeated bending	Scores	4	4
wet rubbing	Cycles	729,8 ± 10,7	744 ± 12,4

quality of raw materials for the leather industry.

2. To produce a different range of leather products (footwear and haberdashery) skins of bull calves of precocious Aberdeen-Angus and long growing Charolais breeds are suitable.

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