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Slaughter qualities of young sheep depending on genotype

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Abstract. Influence of the effect of crossing the Romanov and Edilbay sheep breeds on the main indicators of slaughter was studied. As the object of study, we used the Romanov breed (I group), its crosses with the Edilbay breed of the first generation (½ Romanov × Edilbay — II group) and the second generation (¼ Romanov × ¾ Edilbay — III group). The effect of crossing in terms of slaughter qualities in crossbred young animals was established. At the same time, wethers of group I were inferior to crossbred peers of groups II and III in terms of the carcass fullness coefficient K_1 by 3.40 and 4.48%, respectively, and the level of thigh completion coefficient — by 6.80 and 7.82%, respectively. Crossbreeds of groups II and III were superior to purebred wethers of group I in pre-slaughter live weight by 11.18 kg and 13.32 kg, fresh carcass weight — by 6.03 kg and 7.56 kg, carcass yield — by 1.63 and 2.62%, slaughter weight — by 6.16 kg and 8.00 kg, slaughter yield — by 1.57 and 2.71%, respectively. The advantage in terms of the studied slaughter indicators was in the second generation crossbreeds of the third experimental group.

Keywords: sheep breeding, purebred sheep, Romanov breed, crosses with Edilbay, wethers, pre-slaughter weight, fresh carcass, measurements, carcass coefficients

Author contributions. Yuldashbaev YA. — scientific guidance; Kosilov V.I. — preparation of the program and organization of the study; Nikonova E.A. — execution of the experimental part; Sedykh T.A. — statistical processing of data; Bykova O.A. — description and interpretation of the results obtained.

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Introduction

The main task of agro-industrial complex of the Russian Federation is a significant increase in the production of agricultural products [1—4].

Increase in production of meat and meat products of various types is of relevance [5—10], since meat products are characterized by high nutritional value and are a source of complete proteins containing essential amino acids.

Sheep farming as a low-cost branch of animal husbandry should play a certain role in providing the country's population with meat products, since sheep easily adapt to any climatic zones and are capable of producing good gains when kept on pasture.

For a rational breeding system, it is necessary to use interbreeding — crossbred young animals, due to the effect of crossing, have increased productivity [11—15].

Currently, to improve the meat qualities of domestic sheep breeds, the Edilbay fat-tailed breed is increasingly being used.

The aim of the study was to assess the influence of crossing Romanov breed ewes with Edilbay rams on slaughter qualities of crossbred young animals.

Materials and methods

To conduct the study, three groups of rams were formed. Each group had 15 animals. The groups were formed by origin: Group I included purebred animals of the Romanov breed, Group II included crossbreeds from crossing (½ Romanov × ½ Edilbay), Group III — crossbreeds from crossing (¼ Romanov × ¾ Edilbay). At the age of 3 months, rams of all experimental groups were castrated using a method with complete removal of testicles. The animals were kept according to traditional technology. The suckling period lasted from birth to 4 months. During this period, the experimental animals were kept with ewes. After weaning and up to 8 months of age, the wethers were grazed on pasture, from 8 to 10 months — on final stall fattening.

At the age of 10 months, a control slaughter of three wethers from each group was carried out. After the slaughter of the young animals, morphometric indices were

determined. The measurements of the length of the body and thigh, thigh circumference were taken, on the basis of which coefficient of fullness of the carcass and coefficient of thigh completeness were calculated.

In order to study the slaughter qualities, mass of fresh carcass, internal raw fat, slaughter weight were determined and carcass yield and slaughter yield were calculated.

All the obtained results were subjected to biometric processing using Statistica 10.0 (Stat Soft Inc. USA). The reliability of the obtained data was established by Student. The limit of reliability was the parameter $p < 0.05$.

Results and discussion

The data obtained after slaughter indicate the influence of genotype of wethers on carcass parameters (Table 1).

Table 1

Coefficients of wether carcass in experimental groups, %

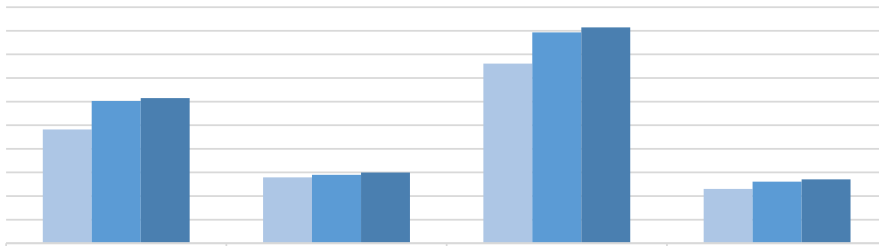
Parameter	Groups		
	I	II	III
Coefficient of fullness of carcass K_1	22.60	26.00	27.08
Hip Completion Ratio K_2	82.53	89.33	90.35

Thus, the crossbred wethers of groups II and III exceeded their purebred peers in body length by 12.09 cm (25.07%, $p < 0.001$) and 13.28 cm (27.54%, $p < 0.001$), respectively, and in thigh length — by 1.14 cm (4.09%) and 1.96 cm (7.03%), respectively.

The established intergroup differences in body and thigh length determined the difference in carcass length in the wethers of experimental groups with a minimum indicator in purebred young animals of group I. It is enough to note that the crossbreds of groups II and III exceeded their peers of group I in carcass length by 13.23 cm (17.38%, $p < 0.001$) and 15.34 cm (20.16%, $p < 0.001$), respectively.

Similar intergroup differences were also noted in thigh girth. At the same time, purebred wethers of group I were inferior to their crossbred peers of groups II and III in the analyzed parameter by 3.09 cm (13.43%, $p < 0.05$) and 4.04 cm (17.56%, $p < 0.05$), respectively.

It is characteristic that the leading position in all morphometric parameters of the carcass was occupied by the second-generation crossbreds of group III. They surpassed the first-generation crossbreds of group II in body length by 1.19 cm (1.97%), thigh length by 0.92 cm (3.17%), carcass length by 2.11 cm (2.36%), and thigh girth by 0.95 cm (3.64%) (Fig.).



	Body length	Thigh length	Carcass length	Thigh circumference
I	48,22	27,88	76,10	23,01
II	60,31	29,02	89,33	26,10
II	61,50	29,94	91,44	27,05

Measurements of carcass of wethers in experimental groups

Source: created by Y.A. Yuldashbaev , V.I. Kosilov , E.A. Nikonova , T.A. Sedykh , O.A. Bykova

It is known that expression of meat quantity of carcass of slaughter animals is largely characterized by coefficients of fullness of carcass and thigh completeness. The obtained data indicate the influence of wether genotype on the value of the analyzed traits with the advantage of crossbred young animals of groups II and III. At the same time, purebred young animals of group I were inferior to them in the value of the coefficient of fullness of carcass by 3.4 and 4.48%, the level of the coefficient of thigh completeness — by 5.80 and 7.82%. The leading position in these coefficients was occupied by wethers of group III, which surpassed their peers of group II in the value of K_1 and K_2 by 1.08 and 1.02%, respectively (see Table 1).

The pre-slaughter weight indicator plays an important role in assessing slaughter qualities. The value of this indicator depends on genotype, as evidenced by the obtained results (Table 2).

Table 2

The results of control slaughter of the wethers in experimental groups

Parameter	Groups					
	I		II		III	
	Parameter					
	M ± *m*	C_v	*M* ± *m*	C_v	*M* ± *m*	C_v
Weight before slaughter, kg	36.70 ± 1.10	1.21	47.88 ± 1.14	1.24	50.02 ± 1.32	1.33
Carcass weight, kg	17.20 ± 0.97	1.10	23.23 ± 0.99	1.16	24.76 ± 1.01	1.22
Carcass yield, %	46.88	–	48.51	–	49.50	–
Raw fat, kg	0.55 ± 0.03	1.10	0.68 ± 0.05	1.12	0.79 ± 0.07	1.21
Slaughter weight, kg	17.75 ± 0.95	1.18	23.91 ± 0.97	1.21	25.75 ± 0.99	1.32
Slaughter yield, %	48.36	–	49.93	–	51.07	–

In this case, due to the crossbreeding effect, the advantage in pre-slaughter live weight was in crossbreeds of groups II and III. Animals of the Romanov breed (group I) were inferior to their analogues in the value of the analyzed indicator by 11.1 kg (30.46%, $p < 0.001$) and 13.32 kg (36.29%, $p < 0.001$).

Intergroup differences in pre-slaughter live weight determined the unequal level of both absolute and relative carcass weight with the advantage of crossbreeds of groups II and III. Purebred wethers of group I were inferior to them in the first generation by 6.03 kg (35.06%, $p < 0.001$) and 7.56 kg (43.95%, $p < 0.001$), the second — by 1.63 and 2.62%. There were no significant intergroup differences in the intracavitary raw fat mass. At the same time, in terms of slaughter mass, there was an advantage of the crossbred young animals of groups II and III over the purebred wethers of group I, which was 6.16 kg (34.70%, $p < 0.001$) and 8.00 kg (45.07%, $p < 0.001$), respectively.

Intergroup differences in pre-slaughter and slaughter weight also influenced slaughter yield of young animals in experimental groups. At the same time, purebred wethers of group I were inferior to their crossbred peers of groups II and III in slaughter yield by 1.57 and 2.71%, respectively.

The obtained results indicate the advantage of second-generation crossbreds (group III) in the main indicators characterizing slaughter qualities of young animals. Thus, animals of the second group (first-generation crossbreeds) were inferior to them in pre-slaughter live weight by 2.14 kg (4.47%, $p < 0.05$), fresh carcass weight — by 1.53 kg (6.59%), its yield — by 0.99%, slaughter weight — by 1.84 kg (7.70%), and slaughter yield — by 1.14%.

Conclusion

The obtained data indicate the prospects of the tested variant of crossing Romanov and Edilbay sheep breeds. The crossbred young animals were distinguished by a higher value of morphometric indices of carcass, the coefficient of fullness of carcass and thigh completeness.

When crossing Romanov ewes with Edilbay rams, a significant increase in the slaughter qualities of the crossbred young animals, especially second-generation wethers, is observed, which is due to the crossbreeding effect.

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Убойные качества молодняка овец в зависимости от генотипа

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Аннотация. Рассмотрены материалы по изучению влияния эффекта скрещивания романовской и эдильбаевской пород овец на основные показатели убоя. В качестве объекта изучения были использованы валушки романовской породы (I группа), ее помеси с эдильбаевской породой первого поколения (½ романовская × эдильбаевская — II группа) и второго поколения (¼ романовская × ¾ эдильбаевская — III группа). Установлено проявление эффекта скрещивания по убойным качествам у помесного молодняка. При этом валушки I группы уступали помесным сверстникам II и III групп по величине коэффициента полномясности туши K_1 соответственно на 3,40 и 4,48 %, уровню коэффициента выполненности бедра — на 6,80 и 7,82 %. В то же время помеси II и III групп превосходили чистопородным валушков I группы по предубойной живой массе на 11,18 и 13,32 кг, массе парной туши — на 6,03 и 7,56 кг, выходу туши — на 1,63 и 2,62 %, убойной массе — на 6,16 и 8,00 кг, убойному выходу — на 1,57 и 2,71 %. Преимущество по изучаемым показателям убоя было на стороне помесей второго поколения III опытной группы.

Ключевые слова: овцеводство, чистопородные овцы, романовская порода, помеси с эдильбаевской, валушки, предубойная масса, свежая туша, промеры, коэффициенты туши

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