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MEAT AND INTERIOR FEATURES OF EWES OBTAINED FROM PARENTS OF DIFFERENT AGE

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Abstract

In this article the meat productivity of offspring received from reciprocal selection of parental pairs of 1.5 and 3.5 years age of the Soviet merino breed sheep. It was found that, on average, the ewes obtained from the uneven-aged selection on the slaughter mass exceeded the ewes received from the even- age selection by 6.2% (P <0.05), on the slaughter yield this superiority was 1.5 abs. percent. It was also found that the ewes obtained from the lambed ewes of 3,5 years age and the rams of 1,5 years age exceeded the herdmates of other variants of selection for slaughter mass from 4.3% (P> 0.05) to 14.9 (P <0.05) and slaughter output - from 0.6 to 2.3 abs.percent. The coefficient of meat in the ewes from the uneven-aged selection was on the average higher by 0.27 units. The first class of cuts was the most in Group II animals (94.2%), which exceeded the herdmates of Groups I, III and IV by this indicator - by 1.8, 0.2 and 0.7%. The first sort of cuts was greatest in animals obtained from lambed ewes of 3.5 years age and rams of 1.5 years age (94.2%), which exceeded the herdmates from 0.2 to 1.8%. The ewes from the uneven-age selection exceeded herdmates from the even-age selection in the length of the small intestine and the average index was 27.8 m, which is higher by 0.5 m, or by 1.8%. The results of the research showed that in terms of meat and interior characteristics, the offspring received from the parents of uneven-age selection are superior to those obtained from the even-age selection parents.

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Key words: sheep, uneven-aged selection, meat productivity, interior indices, sheepskin.

Introduction

When improving the productive qualities of fine-fleeced sheep, special attention should be paid to meat production. Since under the prevailing socio-economic conditions, cost-effective management of sheep breeding can be achieved mainly through the lamb production. Therefore, one of the breeding methods in the lamb production is purebred breeding of sheep using selection of highly productive animals for further breeding (Ts-D. Batozhargalov, 2011; Z. A. Galieva, 2014, G. M. Zhilyakova, M. D. Lagkonova, 2014, E. N. Chernobai, V. I. Guzenko, A. A. Drovorub, 2015; V. I. Trukhachev, V. A. Moroz, E. N. Chernobai*, 2016, 2017; E. N. Chernobai *, V. I. Guzenko, A. A. Drovorub, 2018;). The experience of the development of world sheep breeding shows that the efficiency and competitiveness of sheep breeding are due to a more complete use of the sheep's meat productivity. In future, this trend should be continued, as evidenced by a more intensive increase (by 80%) in the production of sheep meat.

Foreign scientists also confirm that the growth and development of the organism is closely related to the meat production of animals: the more intensive the growth of the animal, the more the slaughter yield increases (J. Raoul, I. Palhière, J. M. Astruc et all, 2017; M. C. Mura, S. Luridiana , F. Farci et all, 2017; R. Masoudi, Shahneh A. Zare, A. Towhidi et all, 2017).

Thus, the efficiency of fine-fleeced sheep breeding depends on the meat productivity of sheep. In the natural and climatic conditions of the North Caucasus, the ratio of pasture and stable period during the year is usually 4: 1, that is, in pastures animals can be up to 280-300 days, so assessing pasture feed plays an important role in growing animals and allows predicting their future productivity. In our studies, the task was to assess the effectiveness of remote monitoring of pasture grasses based on the use of unmanned aerial vehicles for the production of lamb.

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Materials and methods of research

In order to increase the productivity of fine-fleeced sheep in breeding farms, the studies were aimed at studying the different age selection of parental pairs in the farm of Stavropol region in 2013-2015. The material for the study was the purebred dams of the Jalgin merinos breed of different ages (n = 239), as well as four stud rams, two of them aged 1.5 years and two rams aged 3.5 years.

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During the period of artificial insemination, teaser rams were used to sample the dams in the hunt. In order to obtain the same-aged offspring, each of the assigned producers each day received an approximately equal number of dams according to the experimental scheme (Table 1).

Table 1. Scheme of the experiment

Group	RAMS		DAMS	
	age, years	total, h.	age, years	total, h.
I	1.5	2	1.5	57
II	1.5	2	3.5	60
III	3.5	2	1.5	59
IV	3.5	2	3.5	63

Nutritive value of pasture feed for the experimental animals was determined remotely using unmanned aircraft equipped with cameras Canon M10 and chemical methods in the laboratory, the Stavropol State Agrarian University using standard methods. The Botanical composition of pastures as a percentage was as follows: legumes 30% (trifolium, medicago) cereals 70% (brōmus inērmis, agropyron).

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Results and discussion

After hungering, according to the current method of SSRICG (2009), the meat productivity indicators shown in Table 2 were studied.

Before slaughter the live weight of the ewes from the uneven-aged selection of groups II and III was 42.7 kg, that was more than an even-aged selection of groups I and IV by 1.2 kg, or 2.9%. According to the slaughter weight, the ewes of the groups II and III outweighed groups I and IV on average by 6.2%. The slaughter yield of the ewes of the groups II and III received from the selection of different ages was, on average, higher than the given parameter of the ewes from the even-aged selection by 1.5 abs. %.

Table 2. The main indicators of meat productivity of ewes (n = 3)

Indicator	Group			
	I	II	III	IV
Live weight until hunger, kg	41.3 ± 0.73	44.7 ± 1.04	43.3 ± 1.45	43.9 ± 1.17
Preslaughter live weight, kg	40.0 ± 0.50	43.5 ± 0.29	41.8± 1.30	42.9 ± 1.01
Weight of the carcass, kg	16.6 ± 0.27	19.0 ± 0.26	18.1± 0.49	18.3 ± 0.37
Weight of internal fat, kg	0.49 ± 0.02	0.59 ± 0.03	0.51± 0.02	0.51 ± 0.01
Slaughter weight, kg	17.1 ± 0.27	19.6± 0.28	18.6± 0.52	18.8 ± 0.38
Slaughter yield, %	42.8	45.1	44.5	43.8

If we compare the youngsters in the context of the groups, then the ewes of the group II (43.5 kg) obtained from the uneven-aged selection had the largest preslaughter weight, which exceeded the herdmates of the groups I, III and IV by this indicator by 8.8 ($P < 0.01$); 4.1 and 1.4% ($P > 0.05$), they exceeded the weight of the carcass by 14.5 ($P < 0.01$); 5.0 and 3.8% ($P > 0.05$), the mass of internal fat - superiority over all herdmates of all groups - 20%, slaughter weight - 14.9 ($P < 0.05$); 5.5 and 4.3% ($P > 0.05$), and the slaughter yield - by 2.3; 0.6 and 1.3 abs. %.

The ewes of the group III on the slaughter weight exceeded the ewes of the group I by 8.8% ($P < 0.05$) and the ewes of the group IV from the even-aged selection exceeded the ewes of the group on the preslaughter weight by 7.3% ($P < 0.05$) , carcass weight - by 10.2% ($P < 0.05$), slaughter weight - by 9.9% ($P < 0.05$).

The variety and morphological composition of the carcasses of the experimental animals is shown in Table 3.

Table 3. Varietal and morphological composition of the ewes carcasses (n=3)

Group	Yield, %		Coefficient of meatness	Yield of cuts on varieties, %	
	flesh	bones		I	II
I	72.5	27.5	2.63	92.4	7.6
II	75.4	24.6	3.07	94.2	5.8
III	74.0	26.0	2.85	94.0	6.0
IV	73.3	26.7	2.74	93.5	6.5

A variety of carcasses was cut according to GOST 7596-81 - Meat. Cutting lamb and goat meat for retail.

According to the varietal and morphological composition of the carcasses, the ewes from the uneven selection of parents - II and III groups also had the advantage. The average yield of flesh was 74.7%, which is

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more than the average yield of the herdmates from the even-aged selection of parents (I and IV groups) - by 1.8%. The coefficient of meatness in the ewes of the groups II and III obtained from uneven-aged selection was 2.96 on average and was higher by 0.27 or 10% than in groups I and IV. The highest meatness factor was in group II - 3.07, and the lowest - in the group I (2.63). The first class of cuts was greatest among the animals of group II (94.2%), which exceeded the herdmates of group I; III and IV for this indicator - by 1.8; 0.2 and 0.7%.

Data on the development of internal organs of the ewes obtained from the selection of parents of different ages are presented in Table 4.

Table 4. Weight of the internal organs of ewes (n = 3)

Indicator	Group			
	I	II	III	IV
Preslaughter live weight, kg	40.0 ± 0.50	43.5 ± 0.29	41.8±1.30	42.9±1.01
Blood. kg	2.02± 0.04	2.17± 0.03	2.10±0.06	2.16± 0.05
%	5.05	4.99	5.02	5.03
Heart. g	220.0 ± 7.6	247.0 ± 4.4	231.0±7.8	235.0±8.1
%	0.55	0.57	0.55	0.55
Lungs. g	669.3 ± 7.2	695.7 ± 14.5	690.3 ± 9.0	686.7 ± 9.9
%	1.67	1.60	1.65	1.60
Liver. g	753.3 ± 8.8	810.7 ± 5.2	805.7 ± 9.9	806.0 ± 4.9
%	1.88	1.86	1.93	1.88
Kidneys. g	125.0 ± 5.0	130.0 ± 2.8	125.0	130.0 ± 5.7
%	0.31	0.29	0.30	0.30
Spleen. g	70.0 ± 3.61	75.0 ± 3.46	75.0	75.0 ± 2.89
%	0.18	0.17	0.18	0.17
Stomach. kg	1.53 ± 0.09	1.63 ± 0.11	1.55 ± 0.03	1.60 ± 0.11
%	3.82	3.74	3.71	3.73

The interior parameters of the ewes (Table 4) testify that the best development of the internal organs was distinguished by the ewes obtained from the uneven- aged selection (groups II and III), which exceeded the indices of the even-aged group (I and IV group) for blood leakage by 1.9% , the weight of the heart - by 5.1%, lungs - by 1.8; liver - at 3.7; spleen - by 3.4% and by weight of the stomach - by 0.6%.

If we compare in groups, the best development of internal organs was distinguished by the ewes of group II, which exceeded I; III and IV groups in weight of leaked blood by 7.4; 3.3 and 0.5%; heart - by 12.3; 6.9 and 5.1%; lungs by 3.9; 0.8 and 1.3%; liver - by 7.7; 0.6 and 0.6%; kidneys - on 4,0; 4,0% and with IV group the same indicator; spleen - by 7.1%; and with group III and IV the indicator is the same; the stomach by 5.2; 5.2 and 1.9%.

It is established that the weight of the stomach and the length of the thin and thick sections of the intestine are closely related to the productivity of the animal.

In connection with this, we studied the weight of the stomach and the development of internal organs, that is, the length of the thick and thin sections of the intestine (Table 5).

Table 5. Weight of stomach and length of intestine of ewes (n=3)

Group	Weight of empty stomach, kg	Length of intestine, m		
		thin section	thick section	total length
I	1.53 ± 0.09	27.0 ± 0.90	6.3 ± 0.06	33.3 ± 0.96
II	1.63 ± 0.11	28.0 ± 1.15	6.7 ± 0.08	34.7 ± 1.24
III	1.55 ± 0.03	27.7 ± 0.73	6.6 ± 0.11	34.3 ± 0.73
IV	1.60 ± 0.11	27.8 ± 0.17	6.6 ± 0.15	34.5 ± 1.32

The ewes of II and III groups exceed their herdmates in the length of the thin intestine and their average index was 27.8 m, which is higher than the average for animals obtained from the even- aged selection (groups I and IV) by 0.5 m, or by 1.8% . The ewes of II group in the length of the thin intestine (28.0 m) exceeded the herdmates of the I; III and IV groups by 3.7% ($P < 0.05$); 1.4 ($P > 0.05$) and 1.8% ($P > 0.05$). The length of the thick intestine also had an advantage in the ewes from the uneven- aged selection of parents.

For the total length of the intestine, the superiority of groups II and III on average over the ewes of groups I and IV was 2.1% ($P < 0.05$). The longest intestine was found in group II (34.7 m), which exceeded in this indicator herdmates from the I; III and IV groups by 4.2% ($P < 0.01$); 1.8% and 2.1% ($P > 0.05$).

Having studied the development of internal organs of experimental animals, it was established that the ewes obtained from the uneven- aged selection of parents, had a better development of internal organs in comparison with the herdmates from the even- aged selection of parents. And among the groups there were the ewes of group II obtained from adult dams of 3.5 years age and rams-producers of 1.5 years age.

Yu. G. Barsukov, I. N. Shaydullin, F. R. Feyzullaev et al. (2010) studied fur sheepskins obtained as a result of industrial crosses. The authors argue that the weight of sheepskins is an important indicator of the commercial value of the semi- finished product. It depends on the area, the thickness of the skin tissue, the density and length of the hair.

Indicators of weight and area of paired sheepskins of ewes are presented in table 6.

Table 6. Weight and area of paired sheepskins of ewes (n = 3)

Group	n	Preslaughter live weight, kg	Weight of sheepskin, kg	Area of sheepskin, dm²	Ratio of sheepskin weight to preslaughter live weight, %
I	3	40.0 ± 0.50	4.9 ± 0.06	78.7 ± 0.91	12.3
II	3	43.5 ± 0.29	5.4 ± 0.21	83.0 ± 1.28	12.4
III	3	41.8±1.30	5.3 ± 0.07	81.7 ± 0.78	12.7
IV	3	42.9±1.01	5.4 ± 0.16	82.0 ± 0.57	12.6

The ewes received from the uneven-aged selection of parents of groups II and III by sheep weight exceed peer groups I and IV by 3.9%. The heaviest sheepskins were found in animals of the II and IV groups (5.4 kg), exceeding the age groups I and III by 10.2% (P>0.05) and 1.9% (P>0.05). The ratio of the weight of sheepskins to the pre-bogged live weight in the flocks from the age-matched selection was 12.55%, which is higher in comparison with the one-age selection scales by 0.1%.

In terms of the area of sheepskins, they are distinctly different from the uneven-aged selection (groups II and III), which in general exceeded group I and group IV groups by 2 dm² or 2.5%.

Thus, in terms of meat and interior characteristics, the offspring received from the uneven-aged selection of parents outperform the animals obtained from the same-aged selection of parents.

Chemical analysis of the grass showed that the crude protein content was in the range of 10.5%, moisture content 3.4%, and crude fiber of 28.6%, crude fat 2,5%, crude ash 6.9%, the metabolizable energy of 8.5 kcal/100g. These figures may indicate an average value of vegetation index NDVI 0.50 to 0.65 ±0,03. The index value is affected by the species composition of the vegetation, its density, condition, exposure, angle, color of the soil under sparse vegetation. A lower figure can be explained by the presence of woody and dry stems with a low moisture content. It was found that for growing sheep for meat is allowed the use of pastures with an average NDVI is not less than 0.5.

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