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BIOLOGICALLY ACTIVE SUBSTANCES IN THE BLOOD OF KARAKUL SHEEP AND THEIR CONNECTION WITH THE PRESERVATION OF THE GENE POOL OF RARE AND VALUABLE SHEEP

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Abstract:

The article argues that the intensification of global climate change and the degradation of natural landscapes are leading to a sharp decline in the gene pool of domestic and livestock breeds worldwide and the complete extinction of some breeds. It is also stated that this situation affects the gene pool and productivity of karakul sheep, which supply unique and valuable sur karakul skins, and the role of biologically active substances in the blood in the preservation, restoration and reproduction of sur karakul sheep gene pool.

Keywords: Gene pool, biologically active substances, biometric, statistical, analytical, serial, homogeneous, molecular-genetic, criteria, brand, original, morpho-biological.

INTRODUCTION

Demand for food and industrial products is growing at a time when the world's population is growing day by day. Therefore, the development of animal husbandry, the improvement of all types of domestic livestock and livestock breeds, the preservation, reproduction and increase of productivity of the gene pool is one of the global challenges.

At the same time, there are serious problems in maintaining the gene pool of karakul sheep, which supply unequal black, blue, gray and other colored skins in the international fur auction markets. Therefore, on the basis of evolutionary origin, the preservation, restoration and reproduction of the unique population of the gene pool of sur karakul sheep of valuable and antique variety is of great scientific and practical importance.

In this regard, the development of valuable and unique methods of keeping the sheep gene pool of the karakul breed using molecular-genetic methods, preservation of rare and endangered breeds, reproduction, improvement and improvement of the quality of the karakul skins on the basis of the requirements of the global fur market, necessitates research in priority areas.

Therefore, karakul sheep have valuable biological properties, resistance to harsh and unfavorable weather conditions, finding their daily food in low-yielding pastures in years of sparse vegetation and drought, as well as resistance to the scorching heat of summer and the bitter cold of winter.

Uzbekistan has different geographical and ecological climatic conditions, the sheep of the karakul breed are fully adapted to the specific conditions of the steppe and steppe regions.

Sur Karakul sheep are bred in the desert and foothill areas of the Republic of Karakalpakstan, Bukhara and Surkhandarya regions, and are divided into Bukhara, Karakalpak and Surkhandarya sur types in terms of the quality of sur skins grown. [2,4].

We focused our research on the preservation of the gene pool of Surkhandarya Sur Karakul sheep, the restoration and improvement of rare and antique Sur diversity on the verge of extinction, the development of selection and genetic methods to improve biological productivity and quality of Karakul skins.

RESEARCH RESULTS.

Determining and evaluating the process of growth and development of animals, the quality of astrakhan skin, wool and meat productivity is not only selective, but also of biotechnological importance.

Today it is important to introduce and apply biotechnological methods in animal husbandry. Because, taking into account the many types of biological productivity of astrakhan sheep, it is advisable to use not only zootechnical methods, but also complex, but modern technologically significant methods.

In this case, the various biochemical processes that take place in the body of animals, in turn, have certain characteristics. These include biologically active substances, including enzymes, as an important factor in the growth and development of animals, ensuring the intensity of biochemical processes taking place in various organs and tissues of the growing organism. Biochemical processes occur at different rates of metabolism at different age periods and growth processes of animals and have a direct impact on animal productivity.

It is noted that the proliferation of enzymes in organs and tissues, due to its great biological importance in the metabolism of proteins, fats, carbohydrates and minerals, allows it to be used as an additional criterion in the evaluation of animals [3].

Therefore, to reveal the differences in the structure, growth and morpho-biological characteristics of wool coatings of Surkhandarya sur karakul sheep, to determine the degree of inheritance of rare and antique sur variations depending on their mating options, to determine the blood composition of different plant sur karakul sheep the amount of biologically active substances (enzymes, potassium, etc.) and its study in relation to the maintenance and restoration of the gene pool.

In our study, it was observed that metabolism occurs at different intensities during growth at different ages, changes in the amount of biologically active substances, and the activity of enzymes in the blood of karakul sheep depends on their age, color and origin. (Table 1).

Table 1
The activity of enzymes in the serum of karakul lambs change with age, (etc.)

Age	Color	Number (head)	Peroxidase	Tyrosinamino - transferase	O-diphenol oxidase	Aril-esterfase
5-7 day	Black	18	0,108±0,0008	0,167±0,011	4,014±0,36	0,509±0,030
	Surkhandarya suri	18	0,063±0,003	0,125±0,007	2,69±0,12	0,411±0,027
	Bukhara suri	18	0,092±0,002	0,140±0,012	3,64±0,36	0,439±0020
2,0-2,5 month	Black	17	0,208±0,006	0,350±0,028	3,69±0,21	0,473±0,030
	Surkhandarya suri	16	0,179±0,07	0,327±0,018	3,33±0,11	0,500±0,031
	Bukhara suri	15	0,198±0,003	0,508±0,024	3,63±0,15	0,576±0,020
4,0-4,5 month	Black	17	0,243±0,009	0,421±0,027	3,11±0,21	0,548±0,020
	Surkhandarya suri	16	0,271±0,008	0,475±0,011	3,41±0,18	0,526±0,020
	Bukhara suri	15	0,217±0,008	0,565±0,036	3,24±0,19	0,535±0,010
18-18,5 month	Black	13	0,740±0,060	0,430±0,027	5,20±0,60	0,325±0,024
	Surkhandarya suri	14	0,780±0,080	0,500±0,040	2,80±0,20	0,270±0,020
	Bukhara suri	13	0,460±0,014	0,480±0,050	3,00±0,19	0,300±0,025

The table shows that the peroxidase enzyme activity in the blood of animals increased with age (R <0.05), however, significant differences were observed in the age-related change in the activity of the enzyme 0-diphenoloxidase.

Studies have shown that differences in enzyme activity were mainly observed in newborn lambs, i.e., while paratypical factors had little effect on animal color and origin, 0-diphenoloxidase and other enzyme activity were directly related to color and origin.

If we assume that the activity of the enzyme tyrosine-aminotransferase in the blood at the birth of Surkhandarya Sur type lambs is 100%, this figure was 33.6% in black lambs and 12.0% in Bukhara Suri lambs. At other ages, no significant differences in the activity of these enzymes were observed, depending on color and origin.

The analyzes also showed an inverse effect on the activity of the enzymes peroxidase and 0-diphenoloxidase. The fact that black lambs had a much more reliable (R <0.05) activity than their peers in other groups, in the remaining age groups, there was almost no significant difference in color and origin on these traits.

The studies revealed certain similarities and differences in the activity of enzymes in the serum of experimental animals within the breed, the results of which are presented in Table 2.

Table 2
Activity of enzymes in the blood serum of experimental animals and variability within the breed

Color and variety	number (head)	Perok-sidaza (etc.)	Aspartate-amino-trans-feraza (Mk.Mol)	0-diphenol-oxidase (sh.b.)	Tyrosine-amino-trans-ferase (sh.b.)
Bronze	48	0,250±0,027	83,35±3,41	12,04±0,99	0,496±0,047
Amber	52	0,270±0,018	87,33±2,99	8,50±0,84	0,565±0,036
Platinum	48	0,265±0,016	95,59±3,52	7,93±0,87	0,346±0,012
Black	57	0,360±0,017	103,17± 2,41	7,71±0,40	0,167±0,011

It can be noted from the table that the highest activity of the enzyme 0-diphenoloxidase in the serum of Surkhandarya pedigree Sur Karakul sheep was 12.04 TJS in the bronze sura. observed to be 8.50 TL in amber and 7.93 TL in platinum. that is, it was the lowest amount among its peers.

The activity of the enzyme peroxidase in the blood of karakul sheep was found to be high in black sheep. This indicator was found to be 7.9% higher in platinum suri black sheep than in other groups, and the activity of the tyrosine-aminotransferase enzyme was 2-3 times higher in black sheep than in black sheep.

There was a clear difference in the activity of the enzyme aspartate-aminotransferase in the breed, the highest activity was specific to black sheep, the activity of the enzyme tyrosine-aminotransferase was detected in all breeds of Surkhandarya breed sheep and was 4.7-28.1% higher than black sheep (R <0.01).

High activity of the enzyme peroxidase was observed in black sheep, leaving its peers in the other group 7.1–10.2%.

The highest activity of the enzyme tyrosine-aminotransferase was detected in sheep of color variation, with a high degree of variability of the enzyme 0-diphenoloxidase, with a reliable (R <0.001) amount predominating over its black counterparts.

The composition of biologically active substances in the blood of karakul sheep and the analysis of some barra skin and live weight of elite-bred rams showed that although the skin quality, color and age of the experimental rams were the same, their biochemical parameters were different. The results of the study are presented in Table 3.

Table 3
The composition of biologically active substances in the blood of pedigree rams and their relationship to the quality of skins

Elite rams - earrings number	Biochemical parameters of ram blood					Quality characteristics of lamb skin of lambs				Elite lambs, (%)
						Wool-fiber quality (%)		Pigmentation (%)		
	D	P	T	A	E	excellent	good	Intensiv black	black	
2110	0,145	0,350	0,170	56,3	0,473	27,2	63,6	20,0	80,0	18,9
2701	0,132	0,280	0,300	60,5	0,510	75,0	25,0	50,0	50,0	75,0
3568	0,128	0,345	0,210	46,6	0,730	46,2	53,8	50,0	50,0	42,9
0268	0,105	0,370	0,195	38,7	0,490	22,7	65,0	42,9	57,1	36,4
6836	0,115	0,300	0,320	41,0	0,380	54,5	45,5	54,5	45,5	41,0
2999	0,162	0,220	0,310	48,7	0,390	47,1	52,9	77,7	22,3	41,2
2797	0,151	0,351	0,180	52,0	0,680	43,4	56,6	63,6	36,4	50,0
2643	0,170	0,235	0,360	53,8	0,593	58,2	41,8	90,9	9,1	53,3
Average	0,138 ±0,007	0,306 ±0,02	0,25 ±0,02	49,7 ±2,54	0,530 ±0,19	46,8	5,05	56,2	43,8	44,8

Note: D- 0-diphenoloxidase; P-peroxidase; T-triozin-aminotransferase, A-aspartate -aminotransferase; E-arilestraza

According to the table, the quality and pigmentation of wool fiber, the weight of elite lambs in the offspring of rams numbered 2999 and 2643 prevailed over their peers, which in turn showed the highest activity of the enzyme 0-diphenoloxidase in their blood, and their offspring black pigmented lambs 77,7–90.9%.

The highest elite breed lambs were observed in pedigree rams with tags 2643 and 2701 (53.3–75.0%), which is explained by the high activity of the enzyme aspartate-aminotransferase in the serum.

It is known that potassium is biologically important in the internal environment of the animal organism and is inextricably linked with the body's water metabolism and acid-base balance. Potassium affects the course of enzymatic processes by maintaining a normal level of osmotic pressure in the body. The continuity of these processes is ensured by using a certain concentration of cations and anions in internal and external fluids.

Sources state that there is an organic correlation between potassium content and sheep fertility. [5]

Due to the presence of two low (LK-type) and high (NK-type) levels of potassium in the body of animals, they are of great biological importance. It has been found that sheep with high potassium content consume less water than sheep with low potassium content in the blood and tolerate high air temperatures well. [1,2.].

According to available scientific sources, the amount of potassium in the blood of sheep is controlled by two alleles: recessive K^h and dominant K^L. It follows that sheep with the NK phenotype are determined by the K^h / K^h genotype, while the K^L / K^Li K^L // K^h genotypes are phenotypically manifested in the LK-type form due to recessiveness of the K^h gene. Hence, the NK phenotype corresponds to the K^h / K^h genotype. Homozygous K^L / K^L genotype and heterozygous K^L / K^h low levels of potassium are determined by calculation [1,2.].

Based on the histogram of the distribution of potassium concentration in the blood, the level of oscillation at the upper limit of potassium was assumed to be 100 mg.

In our study, the concentration of potassium in the blood of karakul sheep of different colors and origins was studied. (Table 4).

Table 4
Distribution and frequency of alleles on low and high levels of potassium in the blood of Karakul sheep

Color and variety	number (head)	NK-type		LK-type		Frequency of alleles	
		n	M±m	n	M±m	K^h	K^L
Black	104	77	148,5±2,57	27	59,5±3,72	0,872	0,128
Bukhara breed type	82	58	161,9±2,78	24	63,5±2,97	0,883	0,117
Surkhandarya breed type	122	89	131,0±1,71	33	64,3±2,11	0,815	0,185
Totall	308	224	147,1±2,35	84	62,4±2,93	0,856	0,144

According to the table, 224 (72.9 percent) of the 308 head of cattle had high potassium levels and 84 (27.1 percent) had low blood potassium levels. The frequency of the recessive allele was calculated according to the Hardy-Weinberg formula in the sample of sheep studied: K^h -0.815– 0.883, and the dominant allele K^L - 0.117–0.185.

Assuming that the frequency of the allele of Surkhandarya breed of red sheep is 100%, it is 107.0% in black sheep and -108.3% in Bukhara sheep. The difference is statistically significant. (R <0.001)

CONCLUSION

Surkhandarya pedigree rams determine the amount of biologically active substances (enzymes, potassium, etc.) in the blood, use of selected elite rams in breeding and selection work, improve the quality of sur karakul skins, preserve, restore and increase the gene pool of unique and valuable sur karakul sheep creates opportunities.

LIST OF USED LITERATURE

1. Aliev D.D. Changes in the amount of nucleic acids and potassium in the blood of Karakul sheep depending on their physiological functions. Abstract of the dissertation of the candidate of biological sciences. Toshkent., 2010. - 21 p.
2. Aripov U.Kh. Scientific basis for increasing the productivity of Karakul sheep: Author's abstract. dis. doct. agricultural sciences. - Tashkent, 1992. – 38 p.
3. Aripov U.Kh., Aliev DD, Omonov MI, Narzullaev Kh. Methodological recommendations for preserving the gene pool of Karakul sheep of the Surkhandarya Sura. Samarkand .: 2017, 28 p.
4. Gigineishvili N.S. Successes and tasks of colored karakul breeding // Journal of Karakul breeding. Tashkent, 1979. - Iss. X1. - S. 35-36.
5. Erokhin A.I., Drozdenko N.P., Duskin Yu.P. Biochemical basis of sheep breeding. M.: 1977, pp. 16-19.