



## NATURAL RESISTANCE OF KARAKUL LAMBS COLOR INDICATORS

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### Annotation

Immunological and biochemical indicators of natural resistance of Karakul lambs of different colors were studied. According to the results of the study, certain immune and biochemical indicators showed that the natural resistance of lambs of a light brown color exceeds that of lambs of black and gray color.

**Keywords:** black, grey and brown lambs, natural resistance, immuno-biochemical indicators, blood serum, total protein, protein fractions, immunoglobulins, antibodies.

### Relevance of the Topic

The formation of natural resistance in the body is directly related to postnatal ontogenesis. In the first days of postnatal ontogenesis, the newborn animal receives maternal antibodies through colostrum. Colostrum milk contains a lot of albumins and globulins. Immunoglobulins are the main part of proteins and all antibodies in the blood are included in it[1,2,3].

In the body, immunoglobulins are of great importance in the formation of colostrum and natural normal antibodies. Because, while G immunoglobulins are the most active antibodies in the formation of immunity, M immunoglobulins are natural antibodies that appear during the development of the fetus and work from birth to the end of the animal's life[2,3].

Therefore, immunoglobulins cause the accumulation of antibodies in the blood. This is the basis for the formation of colostrum and natural active immunity in the body, that is, the formation of natural resistance[4,5,6].

At present, the problem of natural resistance of animals is of particular importance. Because, with the development of animal husbandry in the farms of our republic, there is a need to develop new, more useful and improved genetic methods to increase





the quality and productivity of animals, their constitutional strength and natural resistance[1,4,6].

It is known that Karakol sheep are an ancient breed in Central Asia. The peoples of Central Asia worked effectively for many centuries and carried out selection work to breed Karakol sheep.

Cattle breeders in their long history of experience divided Karakul sheep into black, grey and brown colors, noting that their vitality is not equal. For example, black-colored sheep are considered more mature, and grey-colored ones are considered looser.

It has been determined that the genotype of grey Karakul sheep is due to the presence of a semi-lethal gene adjacent to the complex of genes determining color [3].

However, complete information on the immuno-biochemical indicators of the genotype-dependent difference of resistance in Karakul sheep of different colors has not been collected [2,3,4].

Therefore, we studied the immune indicators of natural resistance of Karakul lambs of different colors in connection with important biochemical parameters of the organism.

### **The Purpose of the Research**

To study the immune and biochemical parameters of the blood serum of Karakul lambs of different colors and to determine whether the color is important as a genetic marker or not.

### **Research Materials and Methods**

We conducted scientific research work on 30 black, 30 grey and 30 brown, total 90 Karakul lambs of 6-month-old Karakul lambs of Karakul breeding farm "Nurota", Nurota district, Navoi region, which are raised in natural pasture conditions.

We conducted laboratory tests in the scientific research laboratories of the "Animal Physiology, Biochemistry and Pathological Physiology" and "Microbiology, Virology and Immunology" departments of our university.

We determined the dynamics of the accumulation of antibodies against colibacilli, salmonella, pasteurilla, staphylococcus and streptococcus in the blood serum of Karakul lambs using Wright's agglutination reaction, the amount of total protein by the refractometric method, the protein fractions by the electrophoresis method on paper, and the amount of immunoglobulins belonging to the G and M classes by the Mancini immunodiffusion method.



## Research Results

First of all, the immune characteristics of Karakul lambs of different colors were analyzed according to the titer of antibodies in their blood serum.

For this, the titer of antibodies accumulated in the blood serum of black lambs against conditionally pathogenic microorganisms was taken as the level of naturally generated immunity (Table 1).

Because not only pathogenic microorganisms have a negative effect on the newborn organism, but conditionally pathogenic microorganisms also have an effect as the causative agents of infectious diseases when the body's resistance decreases [1,5].

As can be seen from Table 1, it was found that the blood serum of Karakul lambs of all three colors contained specific agglutinins of different titers against conditionally pathogenic microorganisms.

**Table 1 Immune indicators of Karakul lambs of different colors (M±m)**

№	Immune indicators	Color and number of Karakul lambs (n=)		
		Black (n=30)	Grey (n=30)	Brown (n=30)
1	Coli agglutinins	1:200±2,00	1:140±1,67	1:245±2,21
2	Salmonella agglutinins	1:55±1,04	1:65±1,14	1:70±1,18
3	Pasteurella agglutinins	1:65±1,14	1:55±1,04	1:80±1,26
4	Streptococcal agglutinins	1:55±1,04	1:65±1,14	1:60±1,09
5	Staphylococcal agglutinins	1:65±1,14	1:70±1,18	1:70±1,18

It was found that the blood serum of black Karakul lambs contained specific agglutinins in the titer against colibacteria - 1:200, salmonella - 1:55, pasteurella - 1:65, streptococci - 1:55, staphylococci - 1:65.

It was found that the blood serum of the grey Karakul lambs contains specific agglutinins in the titer against colibacteria - 1:140, salmonella - 1:65, pasteurella - 1:55, streptococci - 1:65, staphylococci - 1:70.

It was found that the blood serum of brown Karakul lambs contains specific agglutinins in the titer against colibacteria - 1:245, salmonella - 1:70, pasteurella - 1:80, streptococci - 1:60, staphylococci - 1:70.

So, in the blood serum of Karakul lambs of all three colors, against colibacteria - from 1:140 to 1:245, against salmonella - from 1:55 to 1:70, against pasteurella - from 1:55 to 1:80, against streptococci - from 1:55 to 1: Up to 65, to staphylococci - it was found that there are specific agglutinins in the titer from 1:65 to 1:70.

This indicates that natural immunity, that is, natural resistance, has been formed in the body of Karakul lambs of different colors.



In our studies, the titer of antibodies formed in the blood serum of brown sheep lambs compared to the titer of antibodies formed in the blood serum of black and grey lambs against conditionally pathogenic microorganisms (against colibacteria - 1:245, against salmonella - 1:70, against pasteurilla - 1:80, against streptococci - 1:60, to staphylococci - 1:70) was observed to be much higher.

The results of our research confirmed that the general and specific immune indicators of the body of Karakul lambs against conditionally pathogenic microorganisms are interrelated.

Then we studied the immune indicators of the natural resistance of Karakul lambs of different colors in connection with important biochemical parameters of the organism. Biochemical indicators of natural resistance of Karakul lambs of different colors were analyzed depending on the amount of total protein, its fractions and immunoglobulins (Table 2).

Table 2 Biochemical indicators of Karakul lambs of different colors  
(M±m)

№	Biochemical indicators	Color and number of Karakul sheep (n=)		
		Black (n=30)	Grey (n=30)	Brown (n=30)
1.	Total protein (g/l)	70,0±1,18	70,4±1,18	74,7±1,22
2.	Albumins (g/l)	15,3±0,55	18,9±0,61	17,8±0,59
3.	Alpha globulins (g/l)	16,5±0,57	18,8±0,61	16,1±0,56
4.	Beta globulins (g/l)	16,5±0,57	14,7±0,54	19,0±0,61
5.	Gamma globulins (g/l)	21,7±0,65	18,0±0,60	21,8±0,66
6.	Immunoglobulin M (g/l)	5,04±0,31	4,54±0,30	5,66±0,33
7.	Immunoglobulin G (g/l)	10,50±0,45	10,30±0,45	10,28±0,45

As can be seen from the table, the amount of gammaglobulins and immunoglobulins in the blood serum of black and brown lambs is very close to each other. This indicates that gamma globulins are higher in black lambs than albumins, and in brown lambs they are higher than total protein.

The amount of albumin in brown lambs (17.8±0.59) is much lower than that of grey lambs (18.9±0.61), and the amount of alpha-globulins in grey lambs (18.8±0.61) is lower than that of black lambs (16.5± 0.57) and brown (16.1±0.56) were noted to be higher than the lambs, but they were not confirmed by statistical rules.

One of the characteristic features is that the amount of beta-globulins in the blood serum of brown lambs (19.0±0.61) is much higher than that of grey lambs (14.7±0.54). Also, according to the amount of M immunoglobulins as an indicator of humoral immunity, brown lambs (Ig M= 5.66 g/l), black (Ig M= 5.04 g/l) and grey (Ig M= 4.54 g/l) has an advantage over colored lambs.



Both of these indicators support the resistance of black and brown lambs to grey lambs, and the high total protein content and beta-globulin content serve as an additional biochemical basis.

It should be said that among the Karakol lambs, the brown (agouti) showed a much higher natural resistance as a wild color. In addition, the heterochromic character of brown lambs indicates that their heterozygosity is much higher.

## Conclusions

Based on the results of our research, we conclude the following:

1. The formation of high-titer antibodies of 1:55 to 1:245 in the blood serum of Karakul lambs against conditionally pathogenic microorganisms indicates the formation of natural active immunity and natural resistance to conditionally pathogenic microorganisms in their body.
2. The immunological indicators of brown lambs are much higher than black and grey lambs.
3. Such indicators showed that the natural immune status of brown-colored lambs is superior to that of black and grey-colored lambs.
4. There is a clear correlation between the immune and biochemical parameters determined in the blood serum of Karakul lambs of different colors.
5. Gamma-globulins in blood serum, especially immunoglobulins of class M, indicate a relationship between the amount and the color of lambs.
6. The greater amount of total protein and beta-globulins serves as a biochemical basis for the resistance of black and brown lambs compared to grey lambs.
7. Given that special attention is being paid to increasing the resistance of animals in breeding work in recent years, the determination of such indicators serves to find the immunological parameters of selection.

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