

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## Phenotypic correlation and heritability of signs in sheep received from parents with different ages.

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### ABSTRACT

The article investigates the correlation between economic-useful signs of sheep received from parents of different age selection, as well as their heritability of the main productive characteristics. When studying the correlation between morpho-biochemical indicators, resistance to live weight, the best indicators for the number of erythrocytes, hemoglobin and the total protein were in flasks obtained from mating of queens of 3.5 years of age and young sheep producers of 1.5 years of age and amounted to  $-r = + 0.38$ ;  $r = + 0.45$  and  $r = + 0.36$ , respectively, which are closely related to the metabolism of the animal's body. The correlation of the live mass between mothers and daughters was positive and was in groups of  $r = + 0.22$  to  $r = + 0.38$ , and the highest indicator was in group II. Also on the shaving of washed wool, the superiority was on the side of the bright group II and amounted to  $r = + 0.32$ . The lowest indices of the relationship of symptoms between mothers and daughters were in the I group and amounted to a living weight of  $r = + 0.22$ , a wool trimmed for  $r = + 0.24$  and a wool fineness of  $r = + 0.28$ . Heritability of live weight was in the range from  $h^2 = 0.44$  to  $h^2 = 0.76$ . The highest heritability was observed in offspring obtained from mating of age uterus of 3.5 years of age and young sheep of 1.5 years of age ( $h^2 = 0.76$ ). Also, they had the best indicator for cutting washed hair ( $h^2 = 0.64$ ). Animals obtained from young parents in all studied indicators had the lowest coefficients of heritability.

**Keywords:** sheep, age, live weight, wool haircut, correlation, heritability.

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### INTRODUCTION

Knowledge of the correlation law and its use in breeding practice are essential for updating the methodological principles of selection and breeding work, especially when applied to sheep, where selection and selection is based on a comprehensive assessment of animals for a significant number of signs of productivity [3, 4, 5].

As you know, the body is an integral self-regulating system in which everything is interconnected and interdependent, and changing one sign causes a change in the others. This dependence is called correlation, which is an important genetic parameter, the use of which allows for the desired transformation of utility characteristics [1].

### MATERIALS AND METHODS

The material for the study was the purebred uterus of the Soviet merino breed of various ages (n = 239), as well as four sheep producers, two of which at the age of 1.5 years and two sheep at the age of 3.5 years (experimental design, Table 1 ).

**Table 1: Scheme of experience**

Group	Rams		Ewes	
	age, years	the number of goals	age, years	the number of goals
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

### RESULTS AND DISCUSSION

Of great interest is the interrelation of morpho-biochemical blood indices with the live weight of young animals obtained from parents of different ages and the correlation coefficients are determined (Table 2)

**Table 2: Correlation coefficient of morpho-biochemical indices and resistance with live weight of the examined young at the age of 14 months**

Group	Index				
	erythrocyte count	hemoglobin level	total protein	LASK	BASK
I	+0,23	+0,24	+0,21	+0,26	+0,24
II	+0,38	+0,45	+0,36	+0,46	+0,39
III	+0,27	+0,30	+0,26	+0,37	+0,33
IV	+0,28	+0,35	+0,26	+0,41	+0,40

The correlation analysis revealed a close, unidirectional, positive correlation of the morpho-biochemical parameters of blood with the live mass of the bright in the 14-month-old age. It should be noted that the higher correlation coefficient between blood indices and live weight was in flares obtained from a different age selection of parents, 3.5-year-old sheep and 1.5-year-old rams. High correlation coefficients of lysozyme and bactericidal activity of blood serum show a high adaptability of animals and their safety. Thus, the bright group II of lysozyme activity had a better indicator  $r = + 0.46$ . And the group IV shines outperformed their peers by bactericidal activity of blood serum  $r = +0.40$ , which gives reason to select sheep for live weight of animals. It was also noted that the best correlation coefficients for the number of erythrocytes, hemoglobin and the total protein were in groups II of group II and amounted to  $r = + 0.38$ ;  $r = + 0.45$  and  $r = + 0.36$ , respectively, which are closely related to the metabolism of the animal's body. The lowest correlation

coefficients were shown by animals obtained from young parents-ewes and rams-producers of 1.5 years of age, which affected their safety and growth of live weight.

Thus, when selecting the bright selection group, it is necessary to pay attention to the interrelation of such indices as the number of red blood cells, hemoglobin, total protein, lysozyme and bicercicidal activity of blood serum, since a rather high positive relationship is established between these indices.

Also, a correlation was established between the main economic-useful signs in bright-skinned animals at the age of 14 months (Table 3).

The correlation between the indexes of wool productivity and the live mass is bright, positive for all the features studied.

**Table 3: Correlation of indicators of wool productivity and live weight of bright**

Index	Group			
	I	II	III	IV
Live weight - shaving washed wool	+0,11	+ 0,25	+0,13	+ 0,21
Scouring of washed wool - length of wool	+ 0,43	+ 0,47	+ 0,36	+ 0,45
Length of coat - fineness of wool	+ 0,33	+ 0,57	+ 0,43	+ 0,48
Live weight is the length of the wool	+ 0,23	+ 0,49	+ 0,34	+ 0,33
Live weight - fineness of wool	+ 0,17	+ 0,31	+ 0,18	+ 0,33

It should be noted that the highest correlation coefficients were in groups II, between live weight and wool haircut  $r = + 0.25$ , trimmed wool and length  $r = + 0.47$ , length and fineness of wool  $r = + 0.57$ , live weight and length of hair  $r = + 0.49$ , which gives grounds for selecting animals for cutting washed wool and live weight. The highest correlation was observed between the scraping of washed wool and its length and amounted to groups ( $r = + 0.36$  to  $r = + 0.47$ ), which gives grounds for selecting sheep for the length of the wool or for cutting the washed wool.

There is also a high correlation of signs among animals obtained from animals of the same age age selection of ewes and sheep-producers of 3.5 years of age.

Thus, the analysis of the correlation between the traits that affect wool productivity shows that the increase in wool cutting depends to a large extent on the contingency of such features as the length, thickness of the wool fibers and the living mass.

For selection, the variability of traits caused by the genotype of the animal is important. It is known that the higher the proportion of genotypic variability in the overall phenotypic variability of the trait, the higher the effectiveness of selection (G.M. Zhilyakova, 2005).

Calculations of correlation correlation between economically useful signs of mothers and daughters (Table 4)

**Table 4: Correlation of indicators of wool productivity and live weight between mothers and daughters**

Group	Live weight	Scouring washed wool	Finesse of wool
I	+0,22	+0,24	+0,28
II	+0,38	+0,32	+0,39
III	+0,34	+0,27	+0,33
IV	+0,28	+0,26	+0,43

It was found that the highest correlation between mothers and daughters was in tonic and amounted to  $r = + 0.28$  to  $r = + 0.43$ . The highest indices were in the II and IV groups and amounted to  $r = + 0.39$  and  $r = + 0.43$ . A positive correlation was found for the live mass and was in groups of  $r = + 0.22$  to  $r = + 0.38$ , and the highest index was in groups II. Also on the shaving of washed wool, the superiority was on the side of the

bright group II and amounted to  $r = + 0.32$ . The lowest indices of the relationship of symptoms between mothers and daughters were in the I group and amounted to a living weight of  $r = + 0.22$ , a wool trimmed for  $r = + 0.24$  and a wool fineness of  $r = + 0.28$ .

Thus, the study of the correlation relationship between economic-useful traits, it is established that selection of animals for further reproduction and obtaining high productivity must be carried out according to the fineness of the wool, the cutting of the washed wool and the live mass.

Only genetically determined variability can be used to actually improve the productivity of a population. If variability is caused only by the external environment, then the selection of phenotypically better individuals does not change the quality of the next generations. Therefore, in order to plan the breeding, it is necessary to know the relative shares of the influence on the variability of the heredity and environment feature [2].

The coefficient of heritability ( $h^2$ ) is calculated using the correlation coefficient ( $r$ ) between the daughters' indices and the same indicators of mothers according to the formula:

$$h^2 = 2 \times r_{m/d},$$

where:  $h^2$  – coefficient of heritability,  
 $r_{m/d}$  – coefficient of correlation between signs of mothers and their daughters.

When analyzing the herd by quantitative characteristics, the proportion of genotypic variability in the total phenotypic variety is determined by calculating the heritability factor ( $h^2$ ) (table 5).

**Table 5: Heritability of utility characteristics in sheep**

Group	Live weight	Scouring washed wool	Finesse of wool
I	+0,44	+0,48	+0,56
II	+0,76	+0,64	+0,78
III	+0,68	+0,54	+0,66
IV	+0,56	+0,52	+0,86

Heritability of live weight was in the range from  $h^2 = 0.44$  to  $h^2 = 0.76$ . The highest heritability was observed in offspring obtained from mating of age uteres of 3.5 years of age and young sheep of 1.5 years of age ( $h^2 = 0.76$ ). They also had the best indicator for the cutting of washed wool ( $h^2 = 0.64$ ). Animals obtained from young parents in all studied indicators had the lowest coefficients of heritability. The fineness of the wool is inherited best in animals obtained from age-old queens and rams-producers of 3.5 years of age -  $h^2 = 0.86$ .

**CONCLUSION**

In general, the presented material indicates that between the main signs of productivity, animals have a positive, medium and high statistical relationship, which will facilitate simultaneous effective selection of sheep for all three related traits.

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