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Using Genetic Markers in Breeding Sheep.

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ABSTRACT

The aim of this study was a comparative study of the antigenic spectrum of blood groups in young sheep, resulting in industrial crossing of ewes by North Caucasian meat-wool breed and meat breeds: Texel, Edilbay breed, Poll Dorset. Proved the feasibility and advisability of the use of genetic factors to assess and predict meat productivity of sheep. Studied allele fund by erythrocyte antigen of blood groups and factors set specificity of its composition for sheep of different genotypes (Poll Dorset × North Caucasian meat-wool breed, Texel × North Caucasian meat-wool breed, Edilbay breed × North Caucasian meat-wool breed, North Caucasian meat-wool breed × North Caucasian meat-wool breed). Determined alleles unit (Ab, R, Da), attended with a high live weight. This allows data to recommend erythrocyte antigens to predict at an early age of the animal meat production.

Keywords: crossbreeding, genotype, genetic markers.

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INTRODUCTION

In modern conditions the important issue is to stabilize the sheep industry, conservation, rational use of the existing gene pool of domestic and imported breeds. One of the methods to solve this problem is to increase safe keeping, increase productivity of meat of young animals, improvement of its quality composition. One method to create an array breeds of sheep meat direction productivity is the interbreeding of local breeds with the best meat breeds of domestic and world genebank. At the same time more attention is paid to early techniques of diagnosis meat productivity, as well as obtaining a precocious lamb [1, 2].

Domestic and foreign experience shows the need for using immunogenetic methods in selection and breeding work. This allows precise control over the selection process at the stages when the existing traditional breeding techniques are ineffective. (to establish the authenticity of the origin, marking streak, to determine the degree of genetic similarities and differences between breeds). The most widely used as genetic markers is groups of blood. (erythrocyte antigenic factors) [3, 4, 5, 6, 7].

The scientific and practical interest are data the correlation of individual antigenic factors and productivity. Identification of genetic correlations alleles that control blood group, are important significance in solving the problem of selection and early assessment of the potential of the animals. Therefore, the question of studying the possibility of using immunogenetic methods for forecasting productivity has not lost its relevance.

MATERIALS AND METHODS

Research carried out on the basis of the experimental station All-Russian Research Institute of Sheep and Goat Breeding (village Tsimlyanskaya, Shpakovsky district, Stavropol Territory. The object of the study was the young sheep produced at industrial crossing ewes by North Caucasian meat-wool breed (NC) and ram meat breeds: Texel (T), Edilbay breed (E), Poll Dorset (PD). Collection of blood samples for laboratory tests carried out from the jugular vein in the morning before feeding. Immunogenetic testing was performed using monospecific laboratory reagents of bank immunogenetics on six systems of blood groups (A, B, C, M, R, D). Formulation of reactions of hemolysis and agglutination, genetic and statistical analysis was performed according to guidelines of Stavropol Research Institute of Livestock and Fodder Production, 2005.

RESULTS AND DISCUSSION

Immunogenetic testing has revealed the presence of 14 erythrocyte factors (Aa, Ab, Bd, Bb, Be, Ca, R, Cb, Bi, Bg, Da, Ma, Mb, O) in 6 genetic systems – A, B, C, M, R, D - for ewes exploring options selection (NC×NC, T×NC, E×NC, PD×NC) (Table 1). Comparative analysis of the antigenic spectrum on blood groups of animals of different genotypes established its common for all variants of the crossing, expressed in a high frequency of occurrence Cb (0,500…0,750) - and Bi (0,400…0,625) - antigens; average concentration of factor Bg (0,200…0,375), low - Bb (0,100…0,125), Ma (0,100…0,125), Mb (0,100…0,125) and O (0,100…0,250) - factors. For antigen Aa, Ab, Bd, Be, Ca, R, Da characterized by an uneven distribution: in some cases - it is wide enough, in others - narrow. The amplitude of the frequency of occurrence of a number of factors were subject to significant fluctuations. So, factor Aa often met in the blood crossbred animals T×NC, than the purebred peers NC×NC and hybrids E×NC, descendants PD×NC characterized by an average degree of occurrence studied antigens. In contrast, carriers of the antigen Ab much less frequently detected among the hybrids T×NC compared to the other selection options. The high incidence of antigen Bd and Be observed in pure-bred animals, middle degree - have crossbred lambs T×NC and PD×NC, the lowest - by hybrids E×NC. High concentrations Ca - antigen found in the blood of purebred (0,500) and crossbred (T×NC - 0,625; PD×NC - 0,500) animals, low - by the offspring rams Edilbay breed (0,375). Regarding antigens R and Da, the highest frequency of occurrence of these factors is characteristic of genotypes NC×NC and E×NC.

Comparative analysis of the productivity indicators (live weight) of lambs of different genotypes with a spectrum of antigenic factor in their blood showed that, regardless of pedigree accessory, descendants-carrier Ab, R, Da - factors were more quantity of live weight. However, carriage of these genetic parameters in lambs of different genotypes was different. Among the descendants of rams the North Caucasus and Edilbay carrier Ab - factor was 30,0; 25,0% animal genotypes T×NC and PD×NC – 12,5 and 20,0%, factor R be found in lambs NC×NC and E×NC - 80,0 and 87,5 %; hybrids T×NC and PD×NC - 62,5 and 60,0%, Da - factor – 40,0; 50,0;

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37,5 and 10,0% respectively. As a rule, the presence in the blood erythrocyte antigens Ab, R, Da accompanied superiority largest live weight.

Table 1: The frequency occurrence of blood antigenic factors

System	Antigens	Variants selecting parental pairs			
		NC×NC	T×NC	E×NC	PD×NC
A	Aa	0,100	0,375	0,125	0,200
	Ab	0,300	0,125	0,250	0,200
B	Bb	0,100	0,100	0,125	0,100
	Bd	0,700	0,625	0,375	0,500
	Bg	0,200	0,225	0,375	0,300
	Be	0,300	0,250	0,125	0,200
	Bi	0,400	0,625	0,500	0,400
C	Ca	0,500	0,625	0,375	0,500
	Cb	0,600	0,500	0,750	0,600
M	Ma	0,100	0,100	0,150	0,100
	Mb	0,100	0,125	0,125	0,100
R	R	0,400	0,225	0,475	0,200
	O	0,100	0,100	0,250	0,200
D	Da	0,400	0,375	0,500	0,100

CONCLUSION

Summarizing the results, we can conclude that the formation of an array of sheep meat direction, detection antigen factors Ab , R, Da can be used as a markers for prediction of meat efficiency at an early age.

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