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BLOOD GROUPS OF CATTLE BREEDS AND THEIR USE IN BREEDING.

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Abstract.

The study of the genetic polymorphism of erythrocyte antigens, to establish the alleles that control them and the possibility of using them as genetic markers. Investigate the relationship between blood groups and milk productivity (milk yield, fat content in milk) of animals. Determine the possibilities of using blood groups to increase the fertility of cows from the first insemination. Confirm the effectiveness of immunogenetic control of the reliability of the origin of breeding animals.

Scientific novelty of the research. For the first time in the conditions of Uzbekistan, the blood groups of animals of the Swiss breed, as well as the nature of genetic processes in populations of Swiss cattle during the selection process, were studied.

The dependence of the level of milk productivity of cows-daughters on their inheritance of alternative paternal alleles of blood groups was established. The influence of homo- or heterozygosity of cows according to the systems of blood groups on the degree of their fertility was revealed.

Key words.

alleles, immunogenetic control, blood groups, selection, milk production, genotype, herds.

Introduction.

An increase in the milk productivity of cows by 500-600 kg, and in areas of developed dairy cattle breeding, bring milk yield up to 4000 kg. Impossible without the use of achievements in genetics and new methods in the selection and breeding of dairy cattle. The creation of herds with improved productivity and increased resistance to industrial conditions in such a short period of time makes it necessary to take into account in selection data on the structure of the genotype, the characteristics of the metabolism and behavior of animals. First of all, the data of immunogenetics, which studied the characteristics of the inheritance of blood

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groups, are important, since this will allow the use of individual characteristics of the organism as genetic markers in the selection of animals.

Purpose and objectives of the study. The aim of the study is to establish the immunogenetic characteristics of cattle of the Swiss breed bred in Uzbekistan, and the possibilities of using them in breeding [1-5].

In accordance with this goal, the following tasks were set for ourselves: organizing the selection of schwitz cattle on a scientific basis will make it possible to identify the most valuable related groups of animals, transform them into lines, and thereby accelerate the process of breed formation of brown cattle in Central Asia. Selection during mating of individuals, taking into account the characteristics of the genotype, will make it possible to purposefully increase the heterotic effect and develop proposals to predict the milk productivity of animals.

Implementation of the research results. In the herds of the three farms studied (breeding farms "Savay, Izboskan and Gallyaaral"), an examination of the origin of breeding animals is periodically carried out on the basis of data on their blood groups.

The evaluation of sires is carried out to the productivity of true daughters with a confirmed origin by blood groups.

The selection of replacement young animals with alleles of blood groups positively associated with indicators of milk production is carried out.

All these measures make it possible to complete the herds of breeding farms with highly productive animals, accelerate the creation of a dairy Swiss type of cattle in Uzbekistan.

Methods and materials: The object of the study were the maternal and daughter herds of the breeding farm "Savay" of Kurgantepa, the breeding farm "Izboskan" of the Izbazkan district of the Andijan region and the livestock of the breeding farm "Gallyaral" of the Gallyaaral district of the Jizzakh region. groups of imported animals, the semen of which was delivered from the sperm bank of the Central Research Institute.In addition to Etoro, the immunogenetic characteristics of blood groups were studied on the number of local Swiss cattle.

In total, over a period of 3 years, blood groups were determined in 50 bulls and 2115 cows and young oxen [6-10].

The modern herd of the listed breeding farms mainly consists of animals of new lines and related groups of the desired type of local selection (64-75%).

For the most part, these herds consist of purebred animals, as well as animals of the Y generation. The farms where the studies were conducted are the leading

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ones in Uzbekistan in terms of the use of Swissization. The average milk yield of animals here is 2600-3800 kg with a fat content in milk of 3.7%-3.9%, their live weight reaches 470-500 kg. The herds of these farms have a positive impact on the entire range of Swiss cattle in the region.

The total number of animals of various production groups and their main productivity indicators for each farm are given in tables 1.

Milk productivity of animals of experimental herds

Table 1

Locate a group of cows	Breeding farm "Savay"			Breeding farm "Izboskan"			Breeding farm "Gallyaaral"		
	milk yield	Kg	fat%	milk yield	Kg	fat%	milk yield	Kg	fat%
I lactation	130	3273 *25	3,77*0 ,01	124	248* 24	3,77*0 ,02	91	2368 *38	3,87*0,02
P lactation	272	3321 *15	3,78*0 ,01	140	3350 *36	3,76*0 ,01	188	2622 *25	3,88*0,01
W and	362	3324	3,77*	381	3380	3,77*0	588	2804	3,86*0,01
Wednes day, by herd	764	3228 *22	3,77*0 ,01	645	3348 *28	3,77*0 ,01	867	2720 *14	3,86*0,01
Indicators for the genus									
I lactation	84	3374 *48	3,78*0 ,02	65	3364 *40	3,75*0 ,02	30	2800 *35	3,92*0,03
P lactation	175	3570 *45	3,77*0 ,01	80	3442 *48	3,76*0 ,01	76	2954 *23	3,89*0,02
W and older	225	3640 *35	3,76*0 ,01	250	3450 *32	3,77*0 ,01	219	3252 *24	3,86*0,01
Wednes day, by herd	484	3510 *25	3,77* 0,01	395	3434 *29	3,77*0 ,01	325	3144 *19	3,87*0,01
I lactation	35	4938 *69	3,77*0 ,01	31	4834 *75	3,77*0 ,01	24	4109 *58	3,93*0,03

A certain part of the cattle population in Uzbekistan is made up of descendants of American bulls of the Swiss breed, imported from Russia as breeding material.

The frequency of antigenic factors was determined by the formula:

$\mathbf{P_I}=П/M$

Where:

P_I - frequency of antigenic factors,

П - the number of animals that have this antigen,

M - total number of animals studied.

The frequency of occurrence of B and C alleles was determined by the formula;

$\mathbf{P_1} = \Phi_i/2_n$

Where:

P_1 - allele frequency,

$-\Phi_i$ - the number of animals that have this allele,

$- 2_n$ total number of animals studied.

The index of genetic similarity between the compared groups of animals was calculated by the formula of L.A. Khivotovsky et al..

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$$r = \sum_{i=1}^{n} \sqrt{P_i \cdot q_i},$$

Where

r - genetic similarity index,

P_i, q_i - allele frequency.

To assess the productive qualities of carriers of certain allelic genes, the average productivity of animals of these groups was compared with the average for the herd and with each other.

The relationship between markers - blood group genes and genes that determine the economically useful traits of animals was determined by comparing the productivity of paternal half-sisters who inherited B-alleles alternative to their father.

The significance of the difference in the average values of productivity in the compared groups was determined by Student's t-test, calculated by the formula:

$$t = \frac{M_1 - M_2}{\sqrt{m_1^2 + m_2^2}},$$

Где: t - genetic similarity index,

M_1, M_2- allele frequency.

m^2_1,m^2_2- statistical errors of means

The following grading data were used:

- pedigree information
- information about milk yield and fat content,
- information about the live weight at birth and in the subsequent period of post-embryonic development, which was taken from the breeding cards of the 2-MOL form.

Biometric data processing was carried out using the methods of population analysis described in the manuals of N.A. Plokhinsky, E.K. Merkurye [10].

Results and discussion: Determination of antigenic factors was carried out using 60 reagents belonging to 10 immunogenetic systems: (A, B, C, F-V, J, L, M, S, Z, R'-S').

After determining the antigenic composition and identifying alleles, the frequency of occurrence of antigenic factors was calculated.

As can be seen from its data, some general patterns can be traced in all the studied animals: the antigenic factor F was most frequently encountered on all

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farms (Savay breeding farm - 0.9500, Izboskan breeding farm - 0.9920, Gallyaaral breeding farm - 0, 9530). Subsequently, the sequence of farms in comparison was preserved: H' (0.8340; 0.9000; 0.9220), O_x (0.9970; 0.9920: 0.9910) and z (0.8040; 0.7470; 0.7500). Antigenic factors Z` (0.0330; 0.0230; 0.0310), P_2(0.0830; 0.2030; 0.1090), J_2(0.0400; 0.0840; 0.0470) and X_1(0.02070; 0.0110; 0.0160).

At the same time, there are certain differences on the analyzed issue. So, for example, in the breeding farm "Savai" antigens P_2, Y_1, B_1, B_2 E_3, B are significantly more common, and in the breeding farm "Izboskan" - antigens 03, Y_1, Y_2 in the herd of the breeding farm "Gallyaaral" these were O_1, O_2 O_3,A_2 Y_1 Y_2

All these data indicate a high genetic consolidation of animals of the same breed in the herds of different regions of Uzbekistan.

Conclusions: Our data allow us to draw the following conclusions:

1. In the leading breeding farms of Uzbekistan, where Swiss cattle are selected, the gene pool and polymorphism of herds by blood groups have been discovered. In total, 60 erythrocyte antigens were found in the studied animals, the frequency of which ranged from 0.033 - z to 0.950 - f . 49 alleles were found in the B-system and 50 alleles in the C-system with the frequency of occurrence, respectively, 0.0017-0.2045 and 0.0023-0.2283.

2. The gene pool of herds when using the same sires did not change unequivocally, so as a result of using the bulls Azot 2306, Antey 7438, Gerb 9457 and Shatun 3266, the offspring not only changed the allele frequencies, but also eliminated some of them ($BB_2I_1P_2$; BT_2B Q ; BB_2G_2K010').

3. In some breeding bulls, such as Azot 2306, Antey 7438, Gerb 9457 and Shatun 3266, only B-locus alleles characteristic of them have been identified, they can be used as genetic markers of lines (I_1Y_2G, G" ; B_2P_2 ; B_2 G_3 O_1 T_1)

4. A high genotypic similarity in blood groups between individual herds and lines of Swiss cattle in Uzbekistan was revealed. The herd of the breeding farm "Savay" had an index of genetic similarity with the herd of the breeding farm "Izboskan" r = 0.8850, and with the herd of the breeding farm "Gallyaaral" r = 0.8254. Between the herds of the breeding farm "Izboskan" and the breeding farm "Gallyaaral" the index of genetic similarity is x = 0.8156.

The index of genetic similarity between lines in the Izboskan herd ranges from r= 0.7760 - 0.9130.

5. It was established that the descendants are carriers of alleles BG_3T_1; BB_2p_2, which is inherited from the used bulls~sires, showed a positive relationship with milk yield in both studied herds, while the $BY_2G'I,G'$ allele showed a negative

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relationship. Cows with these alleles had milk yields of 3520, 3418 and 3100 kg, respectively.

Low milk productivity in both studied herds is characterized by cows carriers of the allele in B_1E_3O (3105 and 3005 kg). The difference in genotypes by blood groups in connection with the level of milk production according to the B system was more significant than according to the C system.

6. It has been established that with an increase in the heterozygosity of the genotype of an animal, an increase in their fertility and a decrease in their arrival in repeated hunting are observed. Thus, animals heterozygous for 8-9 systems of blood groups were fertilized from the first insemination by 60% and 16-20% of heads came into hunting again, while in animals heterozygous for system I, these indicators were equal to 31.2 and 38.6%, respectively. (breeding farm "Savai"). Similar data confirm this in the Izboskan breeding farm, they amounted to 55.5; 22.2; 19.2 and 42.3%.

7. When conducting an examination of the reliability of the origin of replacement breeding animals in the herds of the studied farms, it was found that errors in breeding records ranged from 66.3% (Gallyaral breeding farm) to 13.1% (Savay breeding farm), and for individual sires these indicators were in the range of 5.5-70.5%.

With the help of blood groups, it was possible to find true fathers in 65.7% of animals that had erroneous entries in breeding documents [11-16].

8. The selection of animals based on their genotype will allow, based on our data, to increase milk productivity in the studied herds by 169-235 kg, which will make it possible to obtain an economic effect of 48.0 - 66.1 rubles. for one head.

Proposals for production: In order to increase the level of milk productivity of the herds of the studied farms, it is proposed to use immunogenetic tests along with the generally accepted zootechnical methods in the selection of young animals. It is recommended to repair the herd with animals that have $G3`T_1$ and $B_2B_2$ alleles in their genotype; animals with $Y_2G`_1GO_1T_1E_3$ alleles should be culled. It is advisable to make special selection of animals when fixing bulls in order to obtain as many offspring as possible with the desired marker alleles.

When selecting, give preference to animals heterozygous for 7-9 systems of blood groups, which will increase the fertility of cows from the first insemination by half and significantly reduce the percentage of queens that come to re-hunt.

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