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Genetic material of producers of cattle of Volynsk meat breed in bank of genetic resources of animals of M. Zubets Institute of animal husbandry and animal genetics of NAAS

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The purpose. Immunogenetic and molecular analysises of sperm of bulls of Volynsk meat breed which is stored in bank of genetic resources of animals of M. Zubets Institute of animal husbandry and animal genetics of NAAS. **Methods.** Determination of blood groups of producers by erythrocyte antigens of 9 systems (A, B, C, F, I, L, M, S, Z) and alleles of system B. Polymorphy of locuses CAPN 1530 and TG 5 of genes of kalpain and thyreoglobulin was determined using polymerase-chain reaction with the subsequent electrophoretic separation of restricting fragments of DNA in agarose gel. **Results. I**ndividual immunogenetic and molecular analysises were carried out of13 bulls of Volynsk meat breed which biological material was included for long-term storage. Rare for cattle carrying agents of antigen of M were fixed. Frequency of desirable allele G of gene of kalpain at probed animals made 0,654, of desirable allele T of gene of thyreoglobulin — 0,269. **Conclusions.** Obtained data will enable to forecast driving the genetic information in generations of offsets of probed producers.

Key words: *Volynsk meat breed, genetic material, blood groups, genes of kalpain and thyreoglobulin.*

Problem. The rapid development of genetic methods led to the intensification of their use in breeding work with different breeds of cattle, including beef direction and performance. The beginning of the use of genetic markers in livestock research Volynian beef breed were 80 years of last century, when tested first local animals obtained from industrial crossbreeding of local Black and White and Red Polish cattle with bulls of specialized beef breeds: Aberdyn-Angus, Hereford and Limousine [1].

Systematic examination immunogenetic of breeding animals carried out in a laboratory genetic basis of breeding of Institute of Animal Breeding and Genetics UAAS and Republican immunogenetics laboratory (c. Brovary). Testing blood groups conducted pursuant to the general requirements for the control of origin as a mandatory element breeding to ensure the reliability of the newly established national pedigree animals of cattle of beef breed. Accumulated individual information used for the comprehensive analysis of immunogenetic structure of breed [2].

Pursuant to the conservation programs of genetic diversity of farm animals along with biological material laying on points of Representatives rocks to long-term storage it provides for identifying different types of marker systems. Thus, the aim of the presented research was immunogenetic and molecular analysis sperm of bulls of Volynian beef breed that is kept in the bank of animals of genetic resources of IABG nd. a. M.V.Zubets of NAAS.

Materials and methods. For using research used of biological material of bulls of Volynian beef breed, which is involved in the formation of the DNA bank. Immune-genetic evaluation conducted taking into account the types of blood erythrocyte antigen 9 systems (A, B, C, F, I, L, M, S, Z) and of alleles system [3, 4].

Identification bulls of loci genotype for CAPN 1530 and TG 5 calpain and thyroglobulin gene carried by molecular genetic analysis of PCR-RFLP. Genomic DNA was isolated using the reagent "Chelex-100"; and

using a standard set of commercial "DNA Sorb B" (AmpliSens, Russia), according to manufacturer's recommendations. Temperature and number of cycles of PCR amplification for each gene were identified separately. Amplification fragments studied genes was performed using appropriate primers [5].

Results. At the bank of Institute in storage is 6232 sperm doses from 13 bulls of Volynian beef breed, which representing uncommon lines of Buynoho 3042, Tsebryka 3888, Yamba 3066 and Krasavchyka 3004 and Sonnoho 3307-Kaktusa 9828 (table. 1). The spectrum of erythrocyte antigens they observed a variety: identified carriers relatively rare in cattle antigen M (sire Bober 2477) (table 2). For EAS system available genetic material antigens U, U', H'', U'', the system EAC observed moderate variability factors of blood groups.

For systems alleles observed EAV overwhelming number of bulls with markers Aberdeen-Angus breed. In particular, in line Buynoho 3042 (allele YY'), allele I_1YE'Y' found in animals of lines Tsebryka 3888, Buynoho 3042. Allele of Limousin breed BGKE'G'O'G'' marked line Yamba 3066, I_1YE'Y' – is in bulls of lines Tsebryka 3888, Buynoho 3042.

1. Genealogical characteristic bulls of Volynian beef breed, semen of which is stored in a the of bank of genetic resources of animals of IABG nd. a. M.V.Zubets of NAAS

Name of animal, ind. №	Father			Mother	
	Name of animal, ind. №	Genotype	Line	Name of animal, ind. №	Genotype
Bober 2477	Badan 827	LI 3/8 AA HE 1/8 BW	Buynoho 3042	Ternynka 2137	LI HE BW
Bobryk 2352	Badan 827	LI 3/8 AA HE 1/8 BW	Buynoho 3042	Soroka 2087	LI AA BW
Berest 670	Bas 2404	LI 7/16 AA 3/16 HE 1/8 BW	Buynoho 3042	Lasunka 539	LI AA 1/8 HE 1/8 BW
Tsvit 658	Tsnot 2307	LI AA 1/8 HE 1/8 BW	Tsebryka 3888	Layka 923	LI 3/8 AA 5/16 BW 5/16
Tsyrkul' 614	Tsnot 2307	LI AA 1/8 HE 1/8 BW	Tsebryka 3888	Bakaliya 1330	LI AA 1/8 HE 1/8 BW
Baltiyets' 964	Zond 57754	LI AA1/8 HE 1/8 BW	Tsebryka 3888	Borul'ka 439	LI HE BW
Yakut 2398	Yamal 1139	LI AA 3/16 HE 1/16 BW	Yamba 3066	Myrna 212	LI AA1/8 HE 1/8 BW
Yavir 2391	Yamal 1139	LI AA 3/16 HE 1/16 BW	Yamba 3066	Sunytsya 443	LI AA BW
Charodiy 805	Yamb 3066	LI HE BW	Yamba 3066	Chaplya 71	LI AA BW
Kaktus 2491	Kubok 358	LI 3/8 AA HE 1/8 Ч	Krasavchyka 3004	Holubka 481	LI AA BW
Kovryk 2430	Kubok 358	LI 3/8 AA HE 1/8 BW	Krasavchyka 3004	Lyal'ka 3844	LI AA HE BW
Klen 2493	Kubok 358	LI 3/8 AA HE 1/8 BW	Krasavchyka 3004	Charka 1065	LI HE BW
Tsyhan 893	Kaktus 9828	LI AA 5/16 HE BW 1/16	Sonnoho 3307-Kaktusa 9828	Tsytra 1546	LI AA 1/8 HE 1/8 BW

Note. Breeding of animals: LI - limousine, HE - Hereford, AA-Aberdeen-Angus, BW - Black-and-White .

Although of genetic material a range of lines submitted by halfsibs of some bulls, but the immunogenetic markers are quite different. In particular in line of Krasavchyka 3004 it are sons Kubka 358, but namely in they to present markers of Hereford breed – alleles $B^{YD'I'}$ and BA'O'. In genotype of bulls found some alleles of Black and White and Red Polish of cattle: VRQI', BQE'F'I'Q', OG'J'K'O'G''.

2. Types of blood bulls of Volynian beef breed, semen of which is stored in the of bank of animals of genetic resources of IABG nd. a. M.V.Zubets of NAAS

Name of animal, ind. №	Genetic blood group system								
	A	**B**	**C**	**F**	**J**	**L**	**M**	**S**	**Z**
Bober 2477	A	YY /BGKYO	K_2W	F		L	M	H U	Z
Bobryk 2352	A	YY /I_1YE Y	W	FV	J	L	M	H	Z
Berest 670	A	G_3OTY/YD E	W	F				UH H U	Z
Buynyy 3042	A	BGKE G O G /YY	P_2W	F				SUH H U	Z
Tsvit 658	A	I_1YE Y /OG J K O G	$CEWX_2$	F		L		U	Z
Tsyrkul' 614		GYA G G /GTYA G	CEW	F		L		H U	Z
Baltiyets'964		I_1YE Y /G							
Tsebryk 3888		GYA G G /I_1YE Y	CER_1W	F				H	Z
Charodiy 805		YE G Q Y /BPQI	CEW	FV		L		H	
Yakut 2398	A	G_3OTK /YD E O	CER_1WX_1	F				H	Z
Yavir 2391	A	BGKE G O G /G_3OTK	CR_1WX_2	F	J	L		H U	Z
Yamb 3066	A	BGKE G O G /A O	CWX_1	F	J	L		SU	Z
Kaktus 2491	A	G_3OTK /YD I	CER_2W	F	J	L	M	UH H U	
Kovryk 2430	A	OTYE K G /GA D E F G O G	CER_2WX_2	F		L		H	
Klen 2493	A	A O /BQE F I Q	CER_2X_2	FV		L		H U	
Krasavchyk 3004	A	OTYE K G / G_3OTK	C_1EWX_1	F				SUH U H_1 U	Z
Tsyhan 893	A	G_3OTK /G	W	F		L		H U	

By increasing relevance conducting purposeful selection as one of the essential measures to preserve the genetic diversity of farm animals becomes effective instruments in life typing loci of quantitative traits, mutations which allow the use of molecular markers to establish the genotype of animals by the studied gene. World experience of countries with developed livestock confirms that in assessing the quality of beef cattle emphasis should be made on beef tenderness and marbling that relate to quality, genetically determined traits productivity of cattle [6, 7, 8].

For locus gene CAPN1530 calpain that associated with beef tenderness, is the most polymorphic line Yamba 3066. Representatives this line turned out carriers of the three possible genotypes studied gene (table. 3). Similar in genetic structure turned out lines Buynogo 3042 and Krasavchyka 3004. Homozygous carriers of desired alleles G is bulls Bober 2477, Berest 670, Kovryk 2430, Klen 2493 and Charodiy 803 and frequency G allele was 0.654. Of the 13 sires only Tsvit 658 and Yakut 2398 had genotype AA. Other bulls were heterozygous AG and their share was 0.385.

3. Genotype bulls for markers CAPN1530 and TG5 calpain and thyroglobulin genes

Name of animal, ind. №	locus	
	CAPN1530	TG5
line Buynogo 3042		
Bober 2477	GG	CC
Bobryk 2352	AG	CC
Berest 670	GG	TT
line Tsebryka 3888		
Tsvit 658	AA	CC
Tsyrkul' 614	AG	CC
line Krasavchyka 3004		

Kovryk 2430	GG	CT
Klen 2493	GG	CC
Kaktus 2491	AG	TT
line Yamba 3066		
Yavir 2391	AG	CC
Yakut 2392	AA	CT
Charodiy 803	GG	CC
line Sonnoho 3307-Kaktusa 9828		
Tsyhan 893	AG	CC

According to the results of typing TG5 gene locus polymorphic thyroglobulin most line Krasavchyka 3004. Lines Buynogo 3042 and Yamba 3066 alike the distribution of genotypes in lines Tsebryka 3888 and Sonnoho 3307-Kaktusa 9828 heterozygous bulls absent. For gene thyroglobulin bulls Berest 670 and Cactus 2491 – homozygous for the T allele desirable and potentially valuable bulls for distribution of alleles in domestic livestock. In general allele frequencies were 0.269 and 0.731.

Conclusions.

Thus, in the results of immunogenetic and molecular genetic studies determined the individual characteristics of bulls Volynian beef breed for systems of blood group and polymorphism QTL-loci involved in the determination of quality indicators of beef. The resulting information will predict the future movement of genetic information in offspring generations studied bulls that are currently involved in the formation of basic livestock breeding farms array Volynian region.

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