

BOLA-DRB3 GENE AS A MARKER OF COW'S MAMMARY GLAND STATUS

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In recent years, research on the use of liposomal drugs, which do not contain antibiotics for therapy of mastitis are of a great importance. The research used a liposomal preparation which contains *Hypericum perforatum* extract, vitamins, lecithin, and twin. The aim of this study was to assess the suitability of the BoLA-DRB3 gene polymorphism for determining the phenotypic value of the somatic cells in Ukrainian black-and-white dairy cows and to find out the effect of the "Limanin" on the number of somatic cells in cows with subclinical mastitis.

The spectrum of the BoLA-DRB3.2 gene alleles was studied by PCR in Van Eijk et al. For restriction analysis of exzone 2 of the BoLA-DRB3 gene the endonucleases of restriction RsaI, HaeIII, BstYI (XhoII) were used. For the somatic cell count (SCC) samples of parenchymal milk were taken from cows at day 1, 3 and 9 of the experiment. Somatic cell count (SCC) was carried out by Prescott-Breed's calculation method.

The investigated breed is characterized by a uniform distribution of allelic frequencies of the BoLA-DRB3 gene. 28 alleles (mean frequency $P=3.57\%$) of the cows of Ukrainian black-and-white are identified from 54 PCR-RFLP and allelic-specific PCR for the BoLA-DRB3.2 gene. In patients with mastitis of cows, 24 alleles were detected (mean frequency 4.17%). With a frequency of more than 5% , five BoLA-DRB3.2 alleles were identified: *24, *28, *26, *22, and *03. Alleles *16, *25, *31 and *36 in this group did not show at all. Among healthy cows 27 alleles were detected. Of the 8 alleles BoLA-DRB3.2: *22, *24, *08, *13, *28, *10, *03 and *36, were detected with $P(A)\geq 5\%$. The allele BoLA-DRB3.2 *41 was never detected. Biometric analysis of the polymorphism of the BoLA-DRB3.2 gene revealed two alleles that affect the morbidity of cows with mastitis: *24 ($RR=2.17$; $P=11.7\%$; $\chi_2=4.33$) and *26 ($RR=4$; 62 ; $P=4.3\%$; $\chi_2=7.13$). There are also two alleles that determine the resistance of cows to diseases of the udder: *13 ($RR=-5.29$; $P=5.3\%$; $\chi_2=5.65$) and *22 ($RR=-2.52$; $P=1.2\%$; $\chi_2=5.02$).

In samples of milk taken in 92 cows, the number of somatic cells varied from 84 to 6926 thousand cells/cm³. Among them, only 27 samples of SCC did not exceed the threshold of 200 thousand cells/cm³. There were 22 animals with subclinical mastitis in which 876 to 4436 thousand cells/cm³ were detected. The SCC value in 5 cows diagnosed with clinical mastitis was from 2264 to 6926 thousand cells/cm³. The number of somatic cells in 65 healthy cows ranged from 84 to 704 thousand cells/cm³. It was found significant association between allele *28 and low level of somatic cells. Treatment of subclinical mastitis of cows with the "Limanin" led to a decrease in SCC in the milk of experimental animals. On the 9th day in experimental group cows the number of somatic cells ($388.7+44.97$ thousand/cm³) decreased compared to the first day of the experiment ($667.9+64.9$ thousand/cm³), which shows the normalizing effect of the drug on the content of somatic cells in the milk of cows with subclinical mastitis.

In cows of the Ukrainian black-and-white breed of the allele BoLA-DRB3.2 *24 and *26 determine the morbidity of mastitis. Alleles BoLA-DRB3.2 *13 and *22 indicate the resistance of cows to mammary gland diseases. There is a statistically significant association between the allele *28 and the low level of somatic cells in milk. The normalizing effect of liposomal drug "Limanin" on somatic cell cultures in patients with subclinical mastitis of cows has been established.

Keywords: MASTITIS, SOMATIC CELLS, GENE, ALLELE, MAMMARY GLAND, SUBCLINICAL MASTITIS