M. M. Peredriy, V. V. Dzitsiuk. Karyotype variability of Ukrainian Red-and-White Dairy cows with different level of reproductive ability

The article deals with the results of cytogenetic research on Ukrainian Red-and-White Dairy cows with different level of reproductive ability. Cultivation of lymphocytes, preparation of cytogenetic samples, classification and count of chromosome aberrations were performed using conventional methods.

For cytogenetic study three groups of cows were formed by data of zootechnical records depending on traits of cows' reproductive ability. The I group (17 head) composed of animals with impaired reproductive ability. 33 cows with open days not less than 150 days were included to the II group, 25 cows with open days of 51-90 days – the III group.

Significantly greater frequency of cells with aneuploid and polyploid set of chromosomes and cells with chromosomal aberrations was revealed in karyotypes of animals with impaired reproductive ability than in cows with normal reproductive function. Aneuploidy among the numerical chromosomal violations is most common, frequency of which was significantly greater in the I group – 10.5 ± 2.38%, frequency of aneuploid cells in the II group of cows was 6.3 ± 1.45% and in cows with normal reproductive function – 4.46 ± 0.73. The largest number of polyploid cells was found in the I group of cows (1.0 ± 0.01%), frequency in the II and III groups was significantly 2 time and 6 times less, accordingly.

In the studied groups significant differences were revealed in the frequency of chromosomal aberrations. In most cases breaks and gaps, including chromatid gaps, chromosomal and chromatid breaks, deletions, and formed as a result of this the fragments of genetic material were observed. There were not constitutional chromosome rearrangements, including Robertsonian translocation. In the I group of animals, the frequency of chromosomal aberrations was a third higher than the same figure in the II and III groups. The difference between frequencies of higher and lower group value of this figure was 4.15%.

A positive correlation was found between open days and main cytogenetic indicators in all the groups. The highest positive correlation ($r = 0.70$; $r = 0.50$; $r = 0.44$) was revealed between length of open days and frequency of structural aberrations, open days and polyploidy, open days and aneuploidy in the II group of cows with open days 150 days and more. In the I group the highest positive correlation ($r = 0.48$) was found between length of open days and aneuploidy. In the third group defined as control, positive correlation ($r = 0.55$) was also between open days and aneuploidy.

The results of the research give the reason to use indicators of karyotype variability as a criterion for assessing reproductive traits of dairy herd cows.

Keywords: **cattle, karyotype, instability, numerical and structural chromosomal aberrations**