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Variability of cytogenetic and molecular-genetic descriptions of cattle breeds

A breed is a group of individuals with certain phenotypical and genotypical characteristics by the set of alleles and genotypes, by their frequency and by a capacity for reproduction. Breed, as any population tests influence of factors of selection. Its character changeability is both spontaneous and induced. It is therefore impossible to save a breed, as constant group of animals, it is possible only to limit to the scopes of its changeability the antihunt selection.

The thesis is devoted to the researches of chromosomal variability of dairy, beef and combined production bulls. It was found that quantitative mutations of chromosomes depends on the direction of production. Beef cattle are characterized by the highest percentage of cells with polyploidy (2,6–6,9 %).

It was established that the relationship between karyotype variability and first insemination fertilization percentage of Black-and-White Holstein is negative, so with the cytogenetic abnormality frequency increasing the percentage of fertilization was reduced. Simmental bulls connection between cells with asynchronous distjunction of centromere areas of chromosomes, mobility of spermatozoa and their reproductive ability is negative and statistically significant. Thus, cytogenetic analysis is predictive valuable for bulls selection on spermproduction. It is reasonable for meat production forecasting to use cytogenetic markers. The animals, that are increasing the level of polyploid cells with reducing of the frequency of cells with chromosomal aberrations and aneuploidy are recommended for the selection.

Analysis of chromosomal variability relationship with productive traits and reproductive ability of Ukrainian Black and White dairy cows revealed the existence of a negative correlation between chromatid breaks, asynchronous distjunction of centromere areas of chromosomes and live weight of heifers at 18 months. So, cytogenetic analysis can be used for productive traits forecasting.

Key words: Holstein (Black-and-White) cattle, Simmental beef cattle, somatic mutagenesis, karyotype variation, polyploidy, growth hormone, spermproduction.