

**Introduction.** Assisted reproductive technology, especially the use of artificial insemination, plays an important role in the intensification of animal husbandry. Tens of thousands of cows and heifers are inseminated with the semen of one bull, therefore, the quality of the sperm of the used breeding bulls must meet high requirements, the use of low-quality semen can lead to multimillion-dollar losses. Sperm are exposed to various biotic and abiotic factors, both in the body and outside the body. Most of these factors have an indirect and direct impact on the reproductive qualities of sires. Research shows that reproductive performance depends on the body's irritability. The body's response to external stimuli, including meteorological indicators, depends on individual, species and other biological characteristics. The most important genetic factor affecting the fertility of bulls is the breed. High tolerance to difficult meteorological conditions can be one of the reasons for interbreed differences in the qualitative and quantitative indicators of ejaculates in bulls.

The aim of the study was to study the influence of external factors on the qualitative and quantitative indicators of sperm production in bulls of different breeds.

**Materials and methods.** The object of the study was bulls of the following breeds: Jersey (n=3), Montbeliard (n=2), Shvitskaya (n=2), Yaroslavl (n=3) Simmental (n=7). The material of the study was samples of frozen-thawed sperm collected during a period with different levels of geomagnetic activity. The Argus-CASA software was used to study the activity, morphology and fragmentation of DNA in the chromatin of spermatozoa. Microscopy. Microscopic studies were performed using a Nikon Eclipse Ni equipped with a Nikon DS-Qi2 camera with a high resolution (4908 x 3264) (Nikon Japan); at a magnification of x40. Statistical analysis. For statistical analysis of the obtained data, the Spss.15.0 program was used. A multidimensional statistical analysis was performed. The breed and the K-index are considered as fixed factors.

**RESULTS.** The content of progressively mobile spermatozoa differs at a statistically significant level depending on the breed and the level of geomagnetic activity. On days with high geomagnetic activity, the highest fragmentation index was observed in semen samples of Swiss bulls and amounted to  $32.57 \pm 4.17\%$ . This indicator in the samples obtained from Simmental bulls was  $13.02 \pm 2.5\%$  ( $p \leq 0.05$ ). The difference in the average content of progressively mobile spermatozoa obtained and frozen on days with increased geomagnetic activity ( $K_{in} \geq 5.0$ ) and in the absence of geomagnetic activity, it was 17% ( $p \leq 0.05$ ).

Tab. Table 1. Semen quality of bulls of different breeds depending on geomagnetic activity

Breed of bulls	PR, %		DFI		Abnormal sperm, %	
	$K_{in} \geq 5.0$	$K_{in} \leq 5.0$	$K_{in} \geq 5.0$	$K_{in} \leq 5.0$	$K_{in} \geq 5.0$	$K_{in} \leq 5.0$
Jersey	$19.90 \pm 1.32$	$35.93 \pm$	$28.31 \pm 3.11$	$16.25 \pm 2.14$	$8.06 \pm 0.56$	$5.74 \pm 0.21$
Montbeliard	$28.51 \pm 1.53$	$41.31 \pm$	$26.16 \pm 3.24$	$11.31 \pm 1.35$	$7.29 \pm 0.27$	$4.27 \pm 0.23$
Schwyz	$24.35 \pm 1.93$	$44.06 \pm$	$32.57 \pm 4.17$	$20.43 \pm 2.43$	$12.50 \pm 0.63$	$2.87 \pm 0.36$
Yaroslavl	$30.93 \pm 2.61$	$51.94 \pm$	$22.97 \pm 2.31$	$9.21 \pm 1.72$	$5.35 \pm 0.72$	$2.59 \pm 0.86$
Simmental	$30.56 \pm 1.35$	$46.98 \pm$	$13.02 \pm 2.5$	$6.42 \pm 0.89$	$6.17 \pm 0.32$	$1.97 \pm 0.32$

**Conclusion.** Thus, the results of the study indicate the influence of biotic and abiotic factors on the content of progressive motile sperm and on the degree of DNA fragmentation in the chromatin of spermatozoa. The effect of the combination of factors breed\* geomagnetic activity on the studied indicators is not statistically significant.