

*N. M. Makovska, O. D. Biryukova, K. V. Bodriashova. Complex evaluation of resistance and stress steadiness of calves*

The aim of the work was to conduct the complex evaluation of the state of heterospecific resistance and stress steadiness of organism of calves.

**Materials and methods of researches.** A complex scheme was approved for determination of heterospecific resistance of farm animals, which includes application of haematological and immunobiological researches.

The work was carried out in "Khrystynivske" breeding farm at the calves of Ukrainian Red-and-White Dairy breed ( $n = 20$ ) at the age of 2 months. The father of all the investigated calves was bull Inhibitor 402151.

Heterospecific resistance of calves was determined by generally accepted methods. The amount of leucocytes and erythrocytes of blood, phagocytic activity of leucocytes and phagocytosis intensity, lysozyme and bactericidal activity of serum were determined.

The adapted eosinophilic test on stress steadiness and histamine test were applied for determination of general immunoreactiveness as a screening test for farm animals.

The biometrical processing of data was carried out using M. A. Plokhinskiy method and software Microsoft Excel and Statistica6.0.

**Results of researches.** Phagocytic activity of blood leucocytes, on average, was about 56%, and phagocytosis intensity–  $3,5 \pm 0,56$  microbial cells absorbed by an active leucocyte.

The average relative bulge of skin fold ( $R_v$ ) was about 52% at carrying out histamine test. It is stated that 57% of the investigated animals had a normal immune response, about 24% – mionectic, and 2 heifers were in immunosuppression state. There were 3 individuals with high immunoreactiveness ( $R_v \geq 100\%$ ).

Indexes of bactericidal activity of serum at the investigated calves were from 2,6% to 82%, and on average it was  $33,7\% \pm 4,9$  ( $p < 0,001$ ), and activity of lysozyme was from 1,4% to 83,1% and  $21,6\% \pm 4,8$  ( $p < 0,001$ ) on average. It is noted, that animals which had lower live weight at birth were characterized by lower level of bactericidal activity of serum.

Rectilinear correlation dependence between the indexes of phagocytic activity of leucocytes and bactericidal activity of serum ( $r = +0,54 \pm 0,16$ ;  $p < 0,001$ ) was revealed. Positive correlation between bactericidal and lysozyme activity of serum ( $r = +0,61 \pm 0,15$ ;  $p < 0,001$ ) was found.

Weak, but significant correlation between the relative bulge of skin fold ( $R_v$ ) and phagocytic activity of leucocytes indicates that a histamine test is the adequate marker of heterospecific resistance. The animals which had the greatest live weight at birth were characterized by the greatest level of phagocytic activity of leucocytes of blood, and positive correlation between live weight of new-born calves and indexes of phagocytic activity of leucocytes of blood ( $r = +0,28 \pm 0,13$   $p < 0,01$ ) indicates it.

An inverse correlation was also revealed between live weight at the age of 2 months and relative bulge of skin fold ( $r = -0,18 \pm 0,11$ ;  $p < 0,05$ ), which specifies in the presence of growth delay of calves which are characterized by mionectic reactivity in relation to a heterospecific irritant (histamine).

The data of eosinophilic test showed that stress-sensitive individuals were about 58 %.

The analysis of variance showed reliable influence of a stress status on live weight at the age of 2 months ( $P < 0,05$ ) and influence of immunoreactiveness on live weight at the age of 6 months ( $P < 0,05$ ). It should be noted in addition, that impact of a stress status on live weight at the age of 12 months approached to reliable value ( $P = 0,06$ ). In general, there was declining of force of influence of both factors on live weight with age.

Reliable dependence of a stress status and immunoreactiveness on age of first insemination and age of first calving wasn't revealed.

**Conclusions.** Individual variability on the indexes of natural resistance and high level of heterospecific resistance in the most of the investigated calves were revealed in progeny of bull Inhibitor.

The analysis of variance revealed direct influence of heterospecific resistance on the indexes of individual development of animals.

There are pre-conditions in relation to screening application of histamine test and eosinophilic test as informing and economic accessible ones for determination of level of heterospecific resistance and stress steadiness in the system of complex estimation of specifics of pedigree resources.

**Keywords:** calves, natural resistance, stress steadiness, immunoreactiveness, complex evaluation