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NONSPECIFIC AND ANTIOXIDANT RESISTANCE OF COWS AND THEIR CALVES UNDER THE CONDITIONS OF TECHNOGENIC LOAD AND ACTION OF “PREGNAVITAN”

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Pollution of the environment by chemical xenobiotics has a negative impact on the status of productive animal health by reducing immune reactivity and metabolic disorders. All this contributes to suppression of natural resistance, reduce reproductive ability of animals, development of immunodeficiency state and suppress other protective systems in the organism. Development of new medicines focuses on studying opportunities to increase the ability of agents easily penetrate through biomembranes in target cells. Considering the above-said objective of this study was to investigate the influence of subcutaneous injections of vitamin drug in liposomal forms on the performance, antioxidant and immune status of heifers and their calves. Investigate and the explain the influence of experimental drug “Pregnavitan” for correction the immune response in the organism of cows and their calves in the zone with high technogenic load was the main aim of our work.

The animals by principle of analogues were divided in to control and experimental groups of 7 cows in each group. Cows of research group at 30 and 14 days before calving were intramuscularly injected liposomal drug “Pregnavitan” in the dose of 0.04 ml per kg of the body weight, cows in the control group received isotonic sodium chloride in the dose of 10 ml per animal.

The investigation showed the decrease of the activity of cellular and humoral protection factors in the blood of cows during the research period. As is known, in the conditions of immune deficiency in the pregnant animals there are certain negative changes that are manifested by a decrease in the level of complement and individual classes of immunoglobulins. Also, the following links of the body's natural protection, such as the bactericidal activity of the serum and the phagocytic activity of blood neutrophils, were reduced. In cows on 30 and 14 days before the supposed births, the parenteral introduced investigated factors in the form of a liposomal emulsion indicates a positive dynamics of indices of the humoral level of non-specific resistance of the organism.

The significant reduction in bactericidal activity of serum in control animals was observed on 14 days prior to calving in comparison with the month before calving ($P < 0.05$). The two-times administration of the study drug resulted in an increase of the bactericidal activity of the blood serum in cows at 14 and 7 days prior to calving, and in their calves on 3rd day after birth, compared to the control animals. The level of lysocyme activity of blood serum in cows of the experimental group for 14 and 7 days prior calving was higher ($P < 0.05$) than in the control group of animals. The phagocytic activity of neutrophil granulocytes is one of the main compounds of cellular immunity of the organism a probable increase in phagocytosis, namely, phagocytic activity, index and number of phagocytes in the blood of experimental cows for 7 days prior to calving compared to control group animals in this period we noted. Perhaps biologically active substances of the investigated liposomal emulsion stimulated the natural mechanisms of detoxification.

The two-times administration for cows the drug in the form of liposomal emulsion leads to a possible decrease in the content of TBARS and lipids hydroperoxides in plasma at on 14th and 7th days before calving. In calves, from these cows, the content of TBARS and lipid hydroperoxides was 27.3 ($P < 0.05$) and 20.0 % ($P < 0.5$), respectively, lower than in the control group of animals. GP in the blood of experimental group cows was higher in the 7 days prior to delivery ($P < 0.05$), and the content of reduced glutathione was greater than 14 days and 7 days before delivery ($P < 0.05$). The glutathione peroxidation activity in calves from experimental cows was 11.8 % higher and the content of reduced glutathione was 21.4 % ($P < 0.05$) higher than that in control animals. The obtained data confirm the antioxidant and detoxification effects of the components of the study drug.

The drug we used in our study is able to increase resistance of heifers and their calves under conditions of anthropogenic impact. In other words, the composition of liposomal drug had positive effects on metabolic processes, normalized balance between antioxidative activity and peroxidation reactions, and links of immune system.