

UDC 504.61: 591.133.16:636.2

EFFECTIVENESS OF “PREGNAVITAN” ON FACTORS OF NATURAL DEFENSE IN ORGANISMS OF COWS AND THEIR CALVES IN THE CONDITIONS OF TECHNOGENIC LOAD

I. Matiukha, junior researcher, *N. Broda*, senior researcher, *D. Mudrak*, researcher, *I. Matlach*, assistant
iramatiukha@gmail.com

Laboratory of Immunology, Institute of Animal Biology NAAS, Lviv, Ukraine

The negative impact of factors of anthropogenic load caused by the current system of coal mining reduces the potential of immune and antioxidant defense system in the body of animals. That is one of important problem in the modern agricultural industry and veterinary sciences. Thus in our investigation we tried to design and investigate new effective and safe methods for treatment in such conditions.

The study was conducted at privat farm “Nadija” in Sokal district, Lviv region on two groups of cows last month of pregnancy and their calves. The animals by principle of analogues were divided in to the control and experimental groups of 7 cows in each. Cows of research group at 30th and 14th days to the births were intramuscularly injected by liposomal drug «Pregnavitan» in the dose of 0.04 ml per kg of the body weight, for cows of the control group isotonic sodium chloride in the dose of 10 ml per animal was used. The composition of the drug “Pregnavitan” includes: tokopherol acetate, squalene, lecithin, methionine, L-arginine, sodium selenite, oil from the fruit thistle, buckthorn and flax seeds in medical doses. Calves were born from cow’s research group at the 3- and 14-day age were intramuscularly injected by drug in the dose of 0.04 ml per kg of body weight and animals in the control group — respectively isotonic sodium chloride solution. Blood samples were taken from the jugular vein before the morning feeding on the 30th, 14th and 7th days before the anticipated genera, and in calves born from them in 3-, 14- and 28-day age.

The research showed with the increase of gestation time in the blood of cow’s were observed the tendency to growing the number of leucocytes, and the decrease of total protein content and current indexes of cell and humoral links of immune of organism’s defense. It shows the development of physiological immunosuppression in pregnant animals. Strong negative influence on immune system and antioxidant reactivity in cows and their calves has factors of technogenic load existing system of coal mining, especially in the period of pregnancy and in newborn animals. In addition, at the last period of gestation there is an increased need of vitamins and minerals as efficient antioxidants. Injection of experimental drug in the form of liposomal emulsion on the 30th and 14th days before calving caused to significant increasing the content of vitamin A on 7 days before calving by 9.49 % ($P < 0.05$), and vitamin E on 14th days before calving by 10.87 % ($P < 0.05$) and by 14.29 % on 7th day ($P < 0.05$). Intramuscular injection in the last month of pregnancy of vitamins A, D₃, E, lecithin, methionine and cobalt acetate in the form of liposomal emulsion improves the natural resistance of cows and received of them calves. Higher level of vitamins A and E in the serum of calves at all stages of investigation, and significant increasing of vitamin E on 28th day after birth by 29.71 % ($P < 0.05$) compare to the indexes in the serum of calves from control group were established in the experiment. Lack of vitamins, especially A and E in colostrum of cows, causes functional and morphological changes in the body of calves. That’s why injection of corrective substances in this period is very important in farming. Lower content of vitamins A and E in the colostrums on the 3rd day after calving by 2.17 and 2.04 times ($P < 0.001$) in control group, by 1.91 and 1.83 times ($P < 0.001$) in experimental group compare to indexes on the 1st day showed in our results. Injection of the drug in liposomal emulsion increases the level of vitamins in the serum and colostrums of cows and their heifers in the conditions of technogenic load. Two-times injection of experimental drug at the last month of gestation leads to increasing the level of those vitamins in the colostrums at all research periods compare to indexes of control animals. Therefore, the tendency to increasing quantity of vitamin A and significant increasing of vitamin E were discovered ($P < 0.05–0.01$). In the plasma of calves with age increase of lipid peroxidation products was observed. Significant difference content of TBARS on 14 days age and TBARS and hydroperoxides of lipids in the 28-day age calves of control group prove it. Two-times injection to pregnant cows and newborn calf’s drug “Pregnavitan” leads to a possible reduction of TBARS and hydroperoxides of lipids contents in the blood plasma of calves research group in the 14- and 28-day age. In the blood of 14- and 28 days age calves of experimental group high activity of glutathione peroxidase ($P < 0.05$) and increased level of glutathione ($P < 0.05$; $P < 0.01$) were established. With age content of glutathione in the erythrocytes of calves both groups increased, in animals of experimental group those changes were more intensive. Obtained dates confirmed detoxication action of investigated preparation.

In our study, we used a drug in the liposomal form to increase resistance of heifers and their calves under conditions of anthropogenic impact. In other words, the body was acting by complex of stress factors: human impacts and critical periods of ontogenetic development (the early postnatal period, pregnancy and calving). In these circumstances, the drug we have developed for the needs of animals in these conditions: essential vitamins, trace elements and biologically active substances. That composition had positive effects on metabolic processes in animals.