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EFFECT OF ORGANIC COMPOUNDS OF TRACE ELEMENTS IN THE FORM OF LIPOSOMAL FORMULATIONS ON PARAMETERS OF OXIDATIVE STRESS AND ANTIOXIDANT STATUS OF FEMALE RABBITS

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The influence injections of organic compounds of trace microelements in liposomal form on the antioxidant status of female rabbits in the intensification of reproductive ability was established in the article. The results showed that supplementation organic microelements included to liposomal preparations have highly supported by the intensity of metabolism and maintaining antioxidant - prooxidant balance in the reproductive organs, and in particular, in the uterus under the stimulation of ovulation, fertilization and embryo implantation.

Organic trace elements, female rabbits, protein peroxidation, antioxidant status

Essential for the homeostasis of organisms farm animals have minerals (macro and micronutrients). The imbalance of minerals resulting from defective for trace-element composition of forage, causing metabolism, reproductive function, reduced productivity and quality of products [8].

It is known that manganese and zinc affect the growth and reproduction of animals involved in the metabolism of trace elements and is a cofactor of many enzymes. The relationship between manganese and iodine metabolism, so you must control diets of cows with their content. K. Ahola, D. Baker, P. Burns (2004) found that the addition of manganese, copper and zinc affect reproduction, mineral

metabolism in dairy cows, 1-2-year-old heifers and conception rate in artificial insemination [11]. It is proved that zinc proteinase better impact on the formation of the body, reproductive function and immune defense in young and adult animals than zinc oxide.

Feed additives for animals contain some kind of trace elements in the form of inorganic salts or oxides [9]. For normal absorption of minerals should dissolve in the small intestine, in order to connect with organic substances, including amino acids to be transported through the cell membrane. In the present feed carbonates, phosphates, oxalates, which also tend to form insoluble complexes with various inorganic trace elements and reduce their assimilation in the small intestine, causing a number of diseases. Modern biotechnology allows you to create different forms chelate compounds. The acquisition of trace elements in a form when hit with food loss and significantly improved through their feces reduced (Group of Companies Branch of the Russian Biochem Biochem Zusatzstoffe Handels - u. Produktionsges. MbH.mbH www.biochem.net.ru). The use of these drugs in livestock is expensive as possible and only at certain times: early embryonic and dry. Development of methods for production of new organic forms of micronutrients to improve reproductive function is an urgent problem and livestock Ukraine needs to study their effects on reproductive function against a decline in farm animals.

In our previous studies on standardized cell cultures studied the effect dyhlutamatu manganese and zinc in proliferative growth, viability and metabolic state of the cell. It should be noted that, despite the large number of factors that contribute to the disruption of reproductive functions, their effect on the final stage and a sister is to change the operation of cellular and subcellular structures of interrelated processes oxidative modified molecules. Product formed by lipid peroxidation and OMB, now play the main role in the mechanism of cell damage [4, 1]. When the process re oxidation activated complex multicomponent antioxidant system (AOS) body that protects the organs and tissues of excess re oxidation [11].

Therefore, given the universal nature of the interaction of reactive oxygen oxidation products macromolecules of great importance in the assessment of patients

with miscarriage paid functioning antioxidant system. It should also be noted that between indices of lipid peroxidation and immune status, there is correlation, which indicates that the structure and function of cells of the immune system depends on the balance of pro- and antioxidant systems. However, studies on free radical processes, including lipid peroxidation and antioxidant defense mechanisms in violation of the female reproductive health is not enough, which is why scientific interest is the study of the antioxidant system of the animals during pregnancy that develops under the influence of various factors.

In view of the above, the purpose of the study was the introduction of complex preparations of trace elements in the processes of oxidative modification of molecules in the body reaction and rabbit antioxidant system to use drugs.

Materials and methods. The experiment was conducted in order to develop the complex preparation of organic compounds and trace elements in the form of sodium selenite liposomal preparations for the intensification of reproductive function in rabbit breed "Pannon Carpathian" Mukachevske PE "Pannon Carpathian." Animals were divided on the basis of analogies into 3 groups of 10 goals each. All rabbit held on the main diet (OR) economy. The animals of the first group to increase fertilization females for 14 days prior to insemination liposomal drug was administered subcutaneously trace organic compounds at a dose of 5 ml / head, while the second group rabbit - liposomal preparation of micronutrients administered at a dose of 5 ml / head at insemination. The composition liposomal preparation included organic compounds of trace elements - zinc and manganese glutamate, chromium - methionine and sodium selenite, phospholipids and vitamins A, D, E. rabbit all groups were artificially fertilized after synchronization and hormonal treatment according to techniques used on the farm . On day 14 of pregnancy after slaughter rabbit, blood samples were taken and woven reproductive organs for biomedical research. In blood and uterus animals examined indicators of lipid peroxidation (TBA-active products [6], lipid hydro peroxide [2]), oxidative modification of proteins (aldehyde and ketone derivatives [14]), superoxide dismutase (SOD) [3],

catalase [7] and ceruloplasmin [5]. The results were treated statistically using the methods of variation statistics.

Results and discussion. As a result of the research we found changes in the intensity of LPO in the uterus krolematok when administered study drugs that shown in Figure 1. For example, we found that the content of TBA-active products in the uterus of first and second experimental group was significantly lower at 20 and 23% in accordance with their level in the uterus of animals in the control group. With regard to the concentration of hydroperoxides, their content increased in the uterus experimental group 2 animals, but figure was in physiological range for this type of animals during fertilization and pregnancy.

Excessive formation of reactive oxygen species by the action of various factors, including stress, administration, physiological changes in the body (including fertilization and pregnancy) can also induce changes in the protein and cell structures. Initiation OMB is the most dangerous element of cell damage, which causes the inactivation of enzymes and cytoplasmic membrane ion pumps with the gradual introduction of various mechanisms of apoptosis. However, the degradation of proteins is a more reliable marker of oxidative damage to tissues than products of lipid peroxidation, as OMB derivatives are more stable. Therefore, the next step of our research was to analyze the content OMB derivatives in the uterus and rabbit blood. So we found a probable decrease in the content aldehyde and ketone derivatives oxidative modification of proteins in rabbit uterus second experimental group compared with the figures of animals in the control group by 50% and 41% respectively.

The positive effect of organic compounds of zinc on endogenous protective systems and to reduce the intensity of oxidation processes proved to birds [12]. The positive effect of organic compounds on manganese SOD activity and reducing the amount of TBK- active products in fish [13].

We found that the content of TBA-active products in rabbit blood first experimental group was significantly lower at 33%, and the second - 40% than the blood of animals in the control group (Table. 1). This may indicate that the

investigational drugs normalize oxidative processes, and does not cause the intensification of lipid peroxidation, even in times of stress for the body, such as fertilization and pregnancy.

Table 1. The content of the end products of oxidative modification of lipids and proteins in the blood of rabbit.

Groups of animals	TBA active products, nmol MDA / ml	ОМП$_{370}$, U/mL	ОМП$_{430}$, U/mL
Control	2,64±0,06	25,72±3,79	18,33±3,49
Experiment 1	1,76±0,06**	9,37±1,77*	5,41±1,4**
Experiment 2	1,58±0,07**	11,32±4,02*	17,84±4,12

In addition, we recorded a decrease in the content as aldehyde, ketone derivatives and WMD rabbit blood in experimental groups compared with the figures of animals in the control group. With that in animal blood 2 experimental group noted the likely decrease in the content OMP370 and blood rabbit 1 experimental group - and OMP370 OMP430 performance compared with the blood of animals in the control group. Researchers found higher efficiency of organic zinc compounds (ZnPic) to reduce the negative effects of oxidative stress compared with the effect of inorganic microelement (ZnSO4.H2O) [15].

As a result of the research we found significant increase in catalase activity in the uterus of rabbits 2 experimental group compared with the control, but SOD activity did not undergo significant changes.

As for the activity of enzymes in the blood AOC, we have established a probable decrease in catalase activity rabbit both study groups compared with the rate control animals (Table. 2). Perhaps a slight decrease in catalase activity related to its role in oxidative inactivation processes reflected a decrease in the content of lipid peroxidation products and weapons of mass destruction and depletion of enzyme activity.

Table 2. The activity of catalase and ceruloplasmin in the blood of rabbit.

Groups of animals	Catalase, umol / min. * L	Ceruloplasmin mg / ml
Control	1,82±0,25	25,37±0,55
Experiment 1	0,92±0,27*	47,42±5,74*
Experiment 2	0,71±0,16*	27,63±5,81

It is known that in the functioning of antioxidant protection plays an important role -copper-containing oxidase blood, which is involved in the transport and ceruloplasmin disposal of copper, neuroendocrine regulation, hematopoiesis, the regulation of biogenic amines. This is the main antioxidant plasma, which is actively involved in developing the decay products of cells and subcellular structures of inflammation [10]. We found that in the blood of first experimental group significantly increased activity of ceruloplasmin (Table. 2), indicating that the activation of the antioxidant level in response to the drugs.

Conclusions and prospects for further research.

Our studies on the effects of organic trace drugs during fertilization and 14 days before insemination, show positive effects introduced organic compounds on oxidative processes in the uterus and blood rabbit. Probably, organic forms studied trace elements contributed to protecting the body from the damaging effect of ROS mediated through activation of endogenous AO enzymes. The next stage of research planned comprehensive study of biochemical parameters of blood and tissue krolematok and morphometric parameters when administered organic shapes of different combinations of micronutrients during fertilization.

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