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CORRECTION OF SYSTEM OF ANTIOXIDATIC PROTECTION OF AN ORGANISM OF COWS DURING START AND DRY-STAND

The purpose. To determine effect of a specimen Evitsel upon activity of antioxidatic system of an organism of cows during start and dry-stand and on a course of puerperal period. **Methods.** Clinical, biochemical, photometric, mathematical-statistical. **Results.** After injection to cows during start and drystand of a specimen Evitsel in their organism activity of antioxidatic system is increased, the content of POL products drops. That positively influences calving and restoration of reproductive function of cows. **Conclusions.** After application of Evitsel the content of malonic dialdehyde in blood of animals decreases for 38,3% (P<=0,01), the content of diene conjugates decreases for 36 % (P<=0,05), while activity of catalase increases for 60% (P<=0,01). Cows injected with Evitsel passed labors without complications. Duration service-period was shorter for 55 day (P<=0,05) at index of insemination of 1,7 in comparison with control.

Key words: cow, start, dry-stand, Evitsel, antioxidatic system of an organism.

Introduction

Determination of modern aspects of the pathogenesis of various pathological conditions is impossible without studying the mechanisms of destabilization of biological membranes as the basis for numerous of reactions of organism of animals.

It is known that one of the universal mechanisms of cell damage at the level of biological membranes is lipid peroxidation processes (LPO) [1].

The mechanisms leading to disruption of LPO, diverse, general disorders of lipid metabolism, involvement in the pathological process of microcirculation system, as a result of breach of which metabolic and enzymatic landslides that cause hypoxia in the tissues, impaired vascular permeability and its products alteration.

LPO

Activity of LPO flow in the body depends on the concentration of oxygen in the tissues, as well as the enzyme and non-enzyme systems.

As it is known biologically active substances (bioantioxidants), which can in small concentrations inhibit free radical processes by exposure to one or more components of the system of formation of reactive oxygen reactivate antioxidant enzymes, etc.

Everything listed above concludes a system of body protection - antioxidant system (AOS) [3].

The antioxidant protection system of the organism controls all phases and inhibits free radical reactions, from their initiation and ending with the formation of hydroperoxides and MDA [4].

Based on modern ideas about the mechanisms of lipid peroxidation, AOS can be divided into the following groups depending on the metabolite link which directed its action [5].

The first group of antioxidant protection system includes fat soluble endogenous antioxidants:

vitamin E (tocopherols), ubiquinone, vitamin A (retinoly) and provitamins group A (α-, β-, γ-carotene), vitamin D (calciferol), K (phyllochinonei and menohinon) linoleic acid , some steroids hormones, melatonin and others.

The second group may include protective enzymes SOD, catalase, glutathione reductase (GR), and low- and high-molecular compounds containing thiol and seleno groups, including cysteine, cystin and others.

The third protection system - two enzymes glutathione peroxidase (GP), and glutathione transferase (GT).

Fourth protection system is aimed at detoxification Fe2 +.

In the blood plasma, the system is presented by the enzyme ceruloplasmin (ferroxidase) [6].

So complicated multiple antioxidant system is an important factor supporting the constancy of internal environment of the organism, especially during gestation and calving.

Imbalance in the system LPO and AOS underlies the development of various pathological processes in cows during gestation [5].

Taking into consideration the above purpose of the paper is to study the LPO in the organism of cows during dryness of antioxidant system of the organism and development of the methods of correction of antioxidant protection.

Materials and Methods

Research was carried out on Ukrainian black and white breed dairy cows in LLC "Agroprodservice-Invest" Kozova Ternopil region. For the experiment during drying control (n

= 10) and experimental (n = 10) groups of cows were formed. Cows of the experimental group were injected a drug "Evitsel" in a dose of 1.0 ml per 50 kg of body weight per day and it was repeated in three weeks after the first injection. Before and after the injection in both groups blood for biochemical research was taken. Condition of lipid peroxidation (LPO) was determined by the content of blood of cows diethenoid conjugate (DC) and malondial dehyde (MDA) and antioxidant system of the body (AOS) - by activity of catalase [7].

Statistical analysis of the results was carried out using standard computer programs with the definition of the arithmetic mean (M), the statistical error of the arithmetic mean (m), difference probability (p) between the arithmetic mean of two rows of variation for the confidence factor for the difference averages (t), the correlation coefficient (r). Difference between two numbers was considred to be crediable according to * – p≤0,05; ** – p≤0,01;*** – p≤0,001 [8, 9].

Research results. In the last third of gestation course of all kinds of metabolic processes changes, including tissue respiration that causes activation of free radical reactions. Thus the data in Table 1 shows

Table 1 - Content malondial dehyde, diethenoid conjugate and catalase activity in blood of cows during the drying before and after the drug "Evitsel" usage, M ± m, n = 10

Indicators	Preparation	
	Experimental "Evistel"	Control
Malondial dehyde, mmol / l	7,79±0,74 5,63±0,59*	,85±0,59 6,87±0,87
Diethenoid conjugate, mmol / l	47,73±0,19 34,89±0,39*	41,25±0,83 38,08±0.98
Catalase activity, mAbs / l	25,46±1,49 40,50±0,28**	31,41±2,39 35,15±1,14

*Note: numerator - the beginning of the experiment; denominator - the end of the experiment; * - p≤0,05; ** - p≤ 0.01; *** - p≤ 0,001, compared to the beginning of the experiment*

that in the blood of cows of the experimental and control groups higher content of lipid peroxidation products is observed. After injection of drug "Evitsel" in the blood of cows is observed reduction of malondial dehyde (MDA), respectively, by 27.7% (p≤0,05), diethenoid conjugate (DC) 26.9% (p≤0, 05). At this time content of LPO products in the blood of control group of cows remains high. Reduction of lipid peroxidation products in the blood of

experimental group of cows is observed as a result of increased activity of antioxidant protection system, as evidence of increased activity of catalase at 37.1% (p≤0,01).

Increase in activity of first and second groups in the antioxidant system of the organisms of cows is due to the presence in 1 ml "Evitsel" α-tocopherol acetate (vitamin E) - 100 mg. The mechanism of antioxidant action of vitamin E provides high donor properties (reducing the number of free oxygen in the cell by activating its utilization, increased activity of oxidation and phospholyration) and the ability to restore the lipid radicals. Moreover 1 ml of "Evistel" contains seleniym (Se- cysteine) – 0,3 mg.

It should be noted that selenium is a part of selenic acids (Se- cysteine, Se- methionine) and proteins. The inclusion of selenium in the active center of selen-depending glutathione peroxidase (GP) is in the form Se- cysteine. Thus amino acids containing selenium (Se- cysteine, Se- methionine) show an independent antioxidant effect, acting as a "trap" of alkoxyl radicals and participate in non-enzymatic decomposition of lipid hydro peroxides.

The course of calving and a postnatal period is a determining factor in the manifestation of sexual inclination of cows and their fertility and development of the next pregnancy. It should be noted that the effectiveness of preventive measures carried out during the drying and dryness of cows, is twice higher compared to measures undertaken after calving. The data presented in Table 2 shows that the cows which were injected "Evitsel" during the dryness passed calving without complications, and length of service period was shorter for 55 days (p≤0,05) with insemination index 1.7 versus control .

Table 2 - Indicators of reproductive function of cows after use during drying preparation "Evitsel", M ± m, n = 10

Group of cows	Pathology of calving (afterbirth detention)	Mastitis disease in cows	Service period, days	Index of insemination
Experimental “Evistel”	–	–	66,0±3,0*	1,7
Control	1	2“+ +”	121, 0±8,0	1,8

Note: * p≤0,05 compared to the control group.

In a control group of cows insufficient tension of consecutive contractions was diagnosed, leading to pathology of consequent stage. Within 24 hours after birth of the calf operative separation of the fetal placenta was conducted, and measures of prevention of sub-

involution of uterine was carried. In addition, the cows of the control group were also recorded with two cases of subclinical mastitis.

Therefore, the use to cows preparation "Evitsel" during drying increases the antioxidant activity of the organism, which reduces the content of lipid peroxidation products, prevents the development of complications during calving and a postnatal period and prevents mastitis.

Conclusions. Injection of 1 ml per 50 kg of the drug "Evitsel" to cows during dryness enhances the activity of catalase to 37.1% ($r \leq 0,01$), reduces service period for 55 days at insemination index 1.7.

Perspective of further research. Is to find new drugs with antioxidant properties and their effect on the third and fourth protective antioxidant systems of the organism.

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