

“Oriana” OJSC, “Lukor” CJSC, “Prykarpattya-Zakhid-Transnafta-Product”. These objects belong to the most environmentally hazardous ones [8]. Under the current legislation, organizations using the water and enterprises the activity of which has a negative impact on hydrological objects are obliged to protect water resources from pollution. This legislative provision is the essential basis for implementation of water protection measures.

The lack of cartographic materials and the vagueness of water protection zones and coastal protection belts of water objects also contribute to pollution of surface waters in Lviv region [3]. Therefore, it is necessary to solve the problem of determining the size and scope of water protection zones and coastal protection belts along the rivers and basins in the region. Estimated area of coastal protection belts of the region makes 66 568 hectares. Taking into consideration an average value of the above work it requires significant investment.

**Conclusions.** The surface waters belong to the most polluted natural resources in Lviv region. Therefore problem of keeping the adequate ecological status of water bodies and watercourses is extremely urgent. The hydrological resources are influenced by different factors and can be affected, in particular, by the pollution of soil and atmosphere, the landscape structure change, technological loading of the territory, the vagueness of water protection zones and coastal protection belts of water objects, the dropping of insufficiently treated and untreated sewage into the open waters. The improvement of environmental status of water resources in Lviv region demands the implementation of a number of effective measures, which require significant investment.

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#### **INFLUENCE OF FEED SUPPLEMENTS OF MEVESEL AND METIFEN ON LEVEL OF LIPID PEROXIDATION PRODUCTS AFTER CADMIUM LOADING OF BULLS**

*The level of intermediate and final products of lipid peroxidation in chronic cadmium toxicity. We established antioxidant properties of feed additives of metifen and mevesel in young cattle under cadmium stress.*

**Key words:** *cadmium intoxication, an antioxidant, cadmium, lipids, malondialdehyde, conjugated diene, feed additives.*

Animal nutrition is one of the main factors that determine productivity, food production and pay the cost-effectiveness of animal husbandry. It is organized, controlled and regulated by human animals feeding.

Selection and use of feeding the nature of the impact on an animal depends on which of the functional state of the organism has resulted in the exploitation of animals and or if it is healthy or sick.

If any illness violated the relationship between organism and environment, as well as the relationship between the systems of the body. As a result - reduced fitness and reactivity, so, impaired coordination reactions to the impact of living conditions. Treatment should be aimed at the restoration of normal - internal and external relations of the body - balancing with the environment that is achieved normalization of metabolism. The normalization of metabolism food plays a special role.

In nowadays, a large number of messages about the importance of lipid peroxidation (LPO) accumulated in the development of many of toxicosis [2, 3, 5]. However, insufficiently explored the role of lipid peroxidation in cadmium load conditions. It was found that in the process of cadmium toxicity occur disorders of lipid peroxidation, we came to the conclusion that the action of cadmium to suppress excessive free radical reactions in animals, feed additives should be used with strong antioxidant properties that inhibit lipid peroxidation. Of the large number of antioxidants in cadmium toxicosis calves, we studied the preventive effect of feed additives and metifena mevesela. These additives are blocking free radicals and prevent development of stress in animals oksidatsiyного [1, 4]. When stress is a promising detoxification therapy such drugs that are not only able to normalize the antioxidant defense system, but also to participate in the maintenance of metabolic homeostasis of animals affected cadmium.

**The aim** of our research was to establish a preventive effect of feed additives of metifen and mevesel organism steers under cadmium stress.

**Material and methods.** Experiments were performed on 15 bull calves of six months age, which were formed in 3 groups of 5 animals in each:

Group 1 - control (C), steers were fed with forage cadmium chloride at a dose of 6.0 mg / animal / day;

Group 2 - research (R1), steers were fed with cadmium chloride at a dose of 6,0 mg / animal / day with the feed additive metifen at a dose of 0,28 g / kg of feed;

Group 3 - research (R2), steers were fed with cadmium chloride at a dose of 6,0 mg / animal / day with the feed additive of mevesel at a dose of 0.36 g / kg of feed.

The experiment lasted for 30-days. Blood sample was collected from the jugular vein on the 1 - 5 - 10 - 15 - 20 - and 30-th day of the experiment.

The level of malondialdehyde was determined by the method of E.N. Korobeinikova (1989), the level of diene conjugates – method of I.D. Stal'noy (1977).

**Results and discussion.** Lipids and their natural systems form the basis for constructing biological membranes, in which structure they perform important functions. Lipid followed by rearrangement of the double bonds in the diene conjugation system. The reactions of lipid peroxidation quite clearly reflect the functional state of cellular and subcellular membranes that are essential for the sustenance of the whole organism.

The development of a pathological process is preceded by damage to cell membranes, which manifests itself primarily in violation of the functional state of the lipid layer. Numerous toxicosis, which are characterized by violation of the oxidant - antioxidant balance, including cadmium toxicosis. From previous studies it was found that when cadmium load in young cattle imbalance between lipid peroxidation and activity of antioxidant system, causing the body accumulates a large amount of free

radicals and reactive oxygen species, peroxidation products that are harmful to the body in general, and as a decrease in activity of the enzyme and non-enzymatic antioxidant defense system of the body. Therefore, for correction of balance we used feed additives, which have antioxidant properties.

As we took antioxidants feed additives of metifen and mevesel that are allowed in clinical veterinary practice, mainly in sick animals. However, no data in the literature data on the application of these drugs in the cadmium load.

Influence of feed additives on the level of the intermediate products of lipid peroxidation in cadmium toxicosis are shown in Table 1.

As it can be seen from the table the level of diene conjugates in blood of calves, which asked metifen the first day experience was  $6,66 \pm 0,22$  mmol / l, which is 15 % higher than the reference values and 2 % lower than in control animals group. On the fifth day of the experiment the level of diene conjugates in the blood test group animals R1 decreased to 7 % relative to the values of the control group of animals, on the tenth day of the experiment, respectively, decreased to 10 %, and on the fifteenth day of the experience level of diene conjugates decreased by 15 %. On the twentieth day of the experiment the level of intermediate peroxidation products was  $6,32 \pm 0,21$  mmol / l. On the thirtieth day of the experiment the level of diene conjugates decreased to 22 % relative to the control group of animals.

Table 1

**The level of diene conjugates in blood serum of calves after administration of metifen and mevesel in chronic cadmium toxicosis; (M ± m, n = 5)**

Time of blood testing (days)	Diene conjugates (mmol / l)		
	Animals' groups		
	Control (cadmium)	R <sub>1</sub> (cadmium+metifen)	R <sub>2</sub> (cadmium+mevesel)
Baseline	5,74±0,14	5,79±0,19	5,80±0,18
The 1 <sup>st</sup>	6,85±0,21	6,66±0,22	6,62±0,23
The 5th	7,06±0,25	6,60±0,20	6,51±0,21
The 10th	7,31±0,24	6,55±0,25	6,45±0,22
The 15th	7,51±0,28	6,40±0,20	6,20±0,20
The 20th	7,72±0,30	6,32±0,21	5,98±0,18
The 30th	7,92±0,35	6,15±0,20	5,86±0,19

Application of mevesel test group animals R2 contributed more likely to reduce the level of diene conjugates than using metifen.

Indicators of diene conjugates in the blood of animals compared with R1 research group throughout the experiment were lower. Thus, compared with a control group of animals the level indicator on the fifth day of the experiment decreased to 8 %, on the tenth day of the experiment – 12 % on the fifteenth day of the experiment – 17 %. Since the twentieth day of the experiment the level of diene conjugates in blood of experimental calves ranged physiological norms and values were lower relative to the control group of 23 animals and 26 %, respectively.

Consequently, the use and metifen and mevesel by animals under cadmium loading prevents intermediates oxidation lipid in the blood of animals.

The second important factor is the study of the end products of lipid peroxidation - malondialdehyde.

Table 2 shows the change in this indicator in the blood of bulls in chronic cadmium toxicity and the effect of antioxidant drugs: metifen and mevesel.

When feeding animals with cadmium chloride at a dose of 6.0 mg / animal / day animals set level of malondialdehyde growth from the first day of experience, where in

comparison with the original data, it rose to 12,8 %. On the fifth day of the experiment the level of malondialdehyde in the blood of these animals was  $0,284 \pm 0,009$  mmol / l. On the tenth day of the experiment the level of lipid peroxidation products continued to grow, and on the twentieth day of the experiment, it rose to 27 %, on the thirtieth day – 33,8 % compared to the original data.

Table 2

**The level of malondialdehyde in serum of calves after administration of metifen and mevesel in chronic cadmium toxicosis; ( $M \pm m$ ,  $n = 5$ )**

Time of blood testing (days)	Malondialdehyde (mmol / l)		
	Animals' groups		
	Control (cadmium)	R <sub>1</sub> (cadmium + metifen)	R <sub>2</sub> (cadmium + mevesel)
Baseline	0,234±0,008	0,230±0,006	0,237±0,009
The 1 <sup>st</sup>	0,264±0,008	0,258±0,011	0,255±0,009
The 5th	0,278±0,008	0,256±0,010	0,253±0,011
The 10th	0,284±0,009	0,253±0,008	0,250±0,010
The 15th	0,291±0,008	0,249±0,010	0,246±0,009
The 20th	0,298±0,009	0,247±0,009	0,241±0,008
The 30th	0,313±0,010	0,246±0,010	0,239±0,008

The application of metifen and mevesel by steers research groups of animals help to reduce the final product of lipid peroxidation. Comparing the two study groups with the control group, it was found that on the fifth day of the experiment the level of malondialdehyde declined to 9 % respectively. On the tenth day of the experiment in the blood test group of calves R1 level indicator was  $0,253 \pm 0,008$  mmol / l, in the experimental group R2 level was  $0,250 \pm 0,010$  mmol / l. On the fifteenth day of the test the level of malondialdehyde and continued to decline in the quantities of the control group animals, this index decreased in animals metifen asked – to 14 % in animals who asked mevesel – 15 %. In the twenties and thirties experience a day in the blood of experimental groups of calves again marked decrease in the level of malondialdehyde, where he reached the values of the physiological norm.

It should be noted that the use of animals with chronic mevesela cadmium toxicosis contributed to a better reduction of the end products of lipid peroxidation.

**Conclusions:**

- The use of feed additives of metifen and mevesel in conditions of chronic cadmium toxicity steers contributed to the reduction of intermediate and final products of lipid peroxidation, so diene conjugates and MDA;

- When cadmium load of calves the best effect on the inhibition of lipid peroxidation of animals manifested use of the feed additive «Mevesel».

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### ІНДИКАЦІЯ ТА ІДЕНТИФІКАЦІЯ СПОРОНОСНИХ БАКТЕРІЙ З ПРОБІОТИЧНОЮ ПОТЕНЦІЄЮ

З фекалій здорових підсвинків та об'єктів зовнішнього середовища рутинними методами були ізольовані 12 культур сінних бацил у чистому вигляді та вивчені їх основні біологічні властивості. При цьому тільки дві культури були повністю апатогенні, у них були відсутні ферменти патогенності - гемолізину та лецитиназа, а при зараженні, у лабораторних тварин інфекційна патологія не розвивалась.

Культури бацил володіли типовими для виду морфо-тинкторіальними, культуральними та біохімічними властивостями, на підставі чого згідно короткого визначника бактерій Берджі були ідентифіковані як *Bacillus subtilis* і зареєстровані як штами VI-9 і VI-12. Культури депоновані і проводиться процедура патентування та паспортизації.

Депоновані штами сінних бацил проявили виражену антагоністичну активність щодо широкого кола патогенних і умовно-патогенних мікроорганізмів та можуть бути використані як основа для створення пробіотичних препаратів.

**Ключові слова:** *Bac. subtilis*, пробіотичні культури, антагоністична активність, транзиторна мікрофлора, біологічні властивості, стійкість до антибіотикорезистентності

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### ІНДИКАЦІЯ І ІДЕНТИФІКАЦІЯ СПОРОНОСНИХ БАКТЕРІЙ С ПРОБІОТИЧЕСКИМИ ПОТЕНЦІЯМИ

Из фекальных масс и объектов внешней среды рутинными методами были изолированы 12 культур сенных бацилл в чистом виде и изучены их основные свойства. При этом только две культуры были полностью апатогенны, а именно у них отсутствовали ферменты патогенности – гемолизины и лецитиназа, и при заражении лабораторных животных не возникала инфекционная патология.