

**PHYTOBIOPREPARATIONS AND ADAPTIVE PREMIXES FOR ANIMALS IN PROVINCES CONTAMINATED BY XENOBIOTICS**

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**Summary.** *We discuss the use of special premixes and feed within the plant synchronized injection of biologically active preparation to protective actions to chemotoxicants and radionuclides for environmentally safe milk and meat.*

**Key words:** *ration, milk, meat, heavy metals, radionucleids, premixes, biologically active preparation, ecologically pure food.*

**Introduction.** There is production in modern terms, processing and storage of products of stock-raising and water bio resources which act to the user is carried out at the high levels of contamination of environment by the chemical matters of organic origin, nitrates and nitrites, salts of heavy metals, radionuclears and other muds. In this plan a by Asov district is extraordinarily dangerous, in fact there is the source of such contamination not only "Asovsteel" but also other industrial and communal objects and also contacts of aquatorium of sea and flows of rivers, not eliminating Don.

It is heavy to over-estimate the scales of such contamination, and the high level of morbidity of population in by Asov region requires decisive actions in relation to the supply of food products of high quality, and especially animal and marine origin, in fact 70-90 % salts of heavy metals and radionuclears enters the organism of man exactly with these valuable and at the same time at the high level of contamination by dangerous food products.

To cut a harmful stream short of muds in to the chain: environment to, /b this case soil, aquatoriums of sea, lakes, rivers / is the plant of water bioresources / is an animal is a food product is the organism of man, it is necessary yet on an initial stage, on the earliest stage productions or processing. Therefore fully justified and actual aspiration of specialists of wide circle to apply such method, such technology, such preparations and biologically active matters which blocked development of illness, I operate metataksikum citotoksikum, the state of health of animals, resistance of their organism was promoted, their reproductive ability and saving, was improved, was instrumental in creation of terms for production ecologically of net products of stock-raising and water biological resources. Therefore application ecologically of safe technologies is one

of major and at the same time one of the most difficult tasks of zooengineering and veterinary science, the personal interest in which is not closed by the exposure of reason, but also by the necessity of the subsequent effective practical application adapted to the concrete terms (1;2).

The scientifically-informative and patent search conducted by us is /added/ exposed that bulk of sources of literature, developments of technological methods and technologies on the whole not yet able to overcome his thorny problems and requires the improvement of expansion, deepening and adaptation to the of production. Not enough information on blocking of the Cs receipt - 137, Sr-90, U-238, Cd, Zn, Cu, Pb, Hq, As, nitrates, nitritics, other chemical matters from an environment in milk and milk products, meat and products of meat, fish And product of fish et al animal products and water biological resources (3).

The special personal interest is caused by migration of uranium, that lately guarded both scientists and the population of earth.

**Research methods.** Research is included

- determination of the Cs maintenance -137, Sr-90, U-238, Cd, Zn, Cu, Pb, Hq, As, nitrates, nitritics, pesticides, DDT, histamine, helminthes and pathogenic microorganisms in an environment, stems, products of stock-raising, water biological resources and packaged and canned products with addition of the special preparations by laboratory clinical methods and after the chart of researches;
- radiometry researches on devices by the MГA-915-method AAC/Pb, Cd, Zn, Cu, As/; Fluorat-02-2M-metods VEZHК/nitrosamines, hormones, aflatoxins, j vitamins/; chromatograf "Flower-500" - the MAA /Hq method/, a gamut is a spectrometer - method of the spectrometry /Cs-137/; a beta is a spectrometer - method of spectrometry /Sr-90/; Minotavr-method of mineralisation /for preparation patterns/; multiscan EH -method UFA of /antibiotics, hormones, mikotoksins/, uranium analyzes - the AAG method;
- laboratory researches of experimental animals and their blood with you by the value of maintenance of general to the albumen and his factions;
- raising of specific functional tests;
- laboratory researches of quality of products of stock-raising and water bioresources after the generally accepted methods ;
- chemical composition of raw material and products of stock-raising, and water bioresources;
- determination of possibility of adaptation of the special preparations and technological methods to the specific terns of by Asov region;
- determination of economic efficiency of the special preparations and technological methods of production and processing of products of stock-raising and water bioresources;
- determination of accordance of the got products to the requirements of

obligatory minimum list, МБВ № 5061-89, ДР-97.

The chair of the applied ecology will use present facilities for implementation of work, specific: researches will be executed on the chair of clinical biochemistry and clinical diagnostics in the laboratory of quality of forages and products of stock-raising of Institute of the -UAAS stock-raising, in the IEKVM UAAS laboratories and in the Mariupol state laboratory of veterinary medicine, Donezc Institute agrarian production.

**Results and Discussion.** Relative density of non-standard tests of water reservoirs of Priazovye in sanitary-chemical parameters was in 2000 year only 56,6% including Azov sea of 75,7%, bacteriological only 27,7% including Azov sea - 23,7; in 2001 sanitary-chemical 29,7% including Azov sea of 63,0%, bacteriological only 32,4% including Azov sea 23,7%; in 2002 To sanitary-chemical parameters - 29,5% including Azov sea 60,4% on bacteriological parameters only 20,2% including Azov sea - 18,1%.

Relative density of non-standard tests of soil in sanitary-chemical parameters was from 6,1 up to 7,6%, including salts of heavy metals in 2000 - 57,1%, in 2001 - 63,6%, in 2002 year -30,7%.

Excess of maximum concentration limit of cadmium is noted in green grass, in grain of wheat and in water, mercury - in green grass, grain of wheat, in com and water, lead - in green grass, in grain of wheat and in drainaga water of "Azovstal", copper and zinc are above maximum concentration limit in green grass, in carrots and beets, in drainaga water from the industrial enterprises.

Ecological monitoring testifies that environmental contamination by heavy metals can render negative influence on immunity of animals to epizootics. So from surveyed cows in 1994-2003 on leykoz and the young of cattle in 1995. 14,7 % had positive reaction, in 1996 - 23,7 %, in 1999 - 12 %, in 2000 - 17,5 %, in 2001 year - 8,2 %, in 2002 year -10,5 %, in 2003 - 12,2 %, and tuberculosis - in 1997 -33% the most adverse situation on pollution of water and soil by heavy was 2-3 years before metals. The situation remains adverse, quantity of the dumped industrial crude drains in reservoirs of Mariupol in 2000-2002. Was 4,5 meter<sup>3</sup>/pipl/day, and quantity dumped waste 0,3 meter<sup>3</sup>/pipl/day.

Researches of animals their production in 2003 have shown, that in conditions of intensive pollution passes a significant amount, of salts of heavy metals passes into animals. Excess of maximum concentration limit on cadmium is noted in blood of cows (in 1,76 times), in a liver (in 1,62 times) and a kidney of pregnant cows (in 1,94 times); on Mercury - in all investigated organs and tissues, but especially in a liver (in 11,64 times), in kidneys (110,41 times), in muscles (in 4,74 times), muscles of tactus(in 3,18 times), in spleen (in 4,79 times), in fish carcass ( crucian in 4,70-5,07, a pike perch - in 7,67-9,67 times), in fish caviar (in 7,68 times).

Lead is intensively stored in a mammary gland of a cow (excess of maxi-

imum concentration limit in hundreds times), in a spleen (in 5,85 times), in kidneys (in 2,11 times), in a liver (in 8,66 times), in a muscular tissue (in 7,64 times), in fish carcass, especially, trade fish (in 10,93-13,29 times) and in fish caviar (in 11,02 times). In fish carcass the increase in concentration of copper (in 1,24-2,55 times from maximum concentration limit) and arsenic (in 20,1-21,7 times), and zinc - in a muscular tissue of a cow is also registered.

The ecological situation in the city of Mariupol, the suburban water area of Azov sea can be characterized as catastrophic.

The industrial enterprises of the city constantly and intensively dump products of the activity in the environment. Total amount of emissions of harmful substances is 350-377 thousand tons annually within 2000-2002 that makes 700-754 kg per capita. The greatest contribution of pollution is due to joint Stok Company «MMK Ilyich» - 227,5-250,4 thousand tons or 455-501 kg per capita, Open Society MK«Azovstal» - 100,4 - 109,9 thousand tons or on 201-220 kg per capita, Open Society «Markochim» 9,9 - 11,5 a thousand tons or on 20-23 kg per capita.

In this connection relative density of tests of atmospheric air with excess of maximum concentration limit was in 2000 year - 19,5 %, in 2001 - 18 % and in 2002 year - 22,8 % of the city, however, relative density of tests of air with excess of maximum concentration limit Ilyich Open Society «Markochim» of 36,3% has reached 31,8%, besides the contribution of motor transport to pollution of an atmosphere per 2001 reached 47,3% on relative density of the polluted tests and in 2002 - 30,3%.

Even more horrifying picture of pollution of atmospheric air is shown on separate components. So relative density of tests under the level of dust in 2002 has reached 73,6%, hydrogen sulphide - 51,9%, carbon oxide - 77,4%, nitrogen dioxide - 31%.

Excess of maximum concentration limit on of lead near Mariupol reached in ground in 22 times.

Thus, contamination of soil by heavy metals has large heterogeneity on the explored territory, however, from data of the Donetsk institute, at the high concentrations in soil they intensively pass mainly to forages and to organism of animals they enter with a silage (37,5%), hay (17,1%), beet (18,3%) and straw (10,8%). Calculating on the dry matter, most of the heavy metals and especially zinc is on straw, cadmium and copper mostly in beet, lead - in silage.

About 33,3% of heavy metals entered the body with feeds are excreted, urine (6,3%) and milk (3,15%), their considerable part circulates in an organism and accumulates in kidneys, liver, muscles (16,5-30,0%), lead and cadmium possess most cumulative properties.

The balanced feeding and use of special premixes promotes to the increase of average daily weight gains of heifers of Red Steppe breed ( $\delta < 0,001$ ),

the increase of level of milking productivity of heifers ( $< 0,05$ ) and also the decline of level of contamination of milk and meat by heavy metals.

Even in a less contaminated province - in Poltava region there was PDK excess of cadmium in 1,5-2 times, lead - in 4,3 time, copper - in 2,5 times, zinc - in 1,8 times. The negative influence of high doses of heavy metals is aggravated by the fact, that in the feeds of traditional rations there is insufficient amount of antagonists, to stop harmful influence of heavy metals, that increases by lack of vitamins. by unbalanced rations on norms of feeding.

The correction of rations of cows and calves by specially developed premix and phytopreparation of «O» adapted to technogenic terms of province positively influenced on mineral composition of blood. The level of calcium grew at 41,5- 46,2% in cows and 42,4-43,8% in calves, phosphorus - at 34,8-50,8% and 40,7- 43,3% accordingly. Level of copper at reduced at 24,0-32,1% in cows and at 35,1- 45,3% in calves, zinc - at 45,5-68% and 31,4-36,8% accordingly, cadmium - 50,0- 73,4% and 51,1-72,3%, lead at 59,4 in cows and 59,5% in calves, as a result their content began to correspond to the physiological norms (4).

The use of premix and biologically active phytopreparation was accompanied by the improvement of protein metabolism and improvement of immunity. The amount of gamma -globulins in blood of cows was increased at 6,38-9,16% and in calves- 3,64-26,44%; the level of contamination of milk by a copper was reduced in 62,7-72,8%, by zinc in 50,1-57,7%, cadmium - in 67,5-77,5%, by lead - in 76-95,3%, in addition, by somatic cells - in 27,4%.

Due to the use of premix and biologically active phytopreparation it was possible to reduce contaminations of beef by heavy metals: by a copper - at 90,1%, by zinc - at 36,3%, by a cadmium - at 90,9% and lead - at 56,8% ( $\delta < 0,001$ ). Quality of meat increased thus, the coefficient of quality of meat protein at 15,6-24,2%, albumen-high-quality index at 0,24-0,47% at the increase of pre-slaughter living mass, for slaughter output, output of carcass and output of pulp, calculating per 1 kg of bones (4).

An animal organism is biologically similar to plants but not to chemical preparations. In addition to that medicinal plants and preparations produced from them are cheaper than chemical preparations, more available, less toxic and they do not have by-side effect.

We believe that the use of medicinal plants has become more effective in the support of the immune status of the body at a high level. To provide it special premixes adapted to the definite conditions of nutrition should be included in the ration of animals. In this connection we offer medicinal products of the plant origin for the market of veterinary preparations. We recommend to use the above products together with special premix.

For Ukraine, in connection with the industrialization and chemization of

the industrial production and as a result of heavy consequences of Chernobyl catastrophe, veterinary preparations must have not only the curative effect on animals and provide the production of pure food for humans at the final stage of human food production chain but they must help to solve the problem of the prolonged purification of agrobiogeocenosis from potential toxicants.

The practice shows that the level of water, soil and air pollution in Donetsk region of Ukraine is very high, especially in Mariupol. Uncompleted construction of agricultural production plants, storage and processing units lead to the concentration of xenotoxicants, microorganisms, metabolites and toxins in the food of animal origin.

According to the data of the survey conducted by Mariupol laboratory of veterinary medicine the samples were positive when bacteriological investigation; was done; the functioning units of the industrial, coal-mining, chemical and agricultural production have a negative influence on the quality of dairy, meat and fish products, first of all, on the content of microorganisms, heavy metals (Cd, Pb, Hg, As, Cu, Zn, Fe), pesticides and radionucleids in them.

Thus, on the basis of the chemical composition of feeds, the requirements of animals and their supply with microelements, vitamins, a new premix has been developed to compensate the deficiency of the substances in the ration and to reduce the level of heavy metal and radionucleide concentration in an animal body and in the food of animal origin: in milk and meat.

Selen, Molibden, Zink, Cobalt, Manganese, Iodine, S, vitamins A and E, citric acid, Na succinate have been included in the composition of the premix. The dose of the premix is 1% per 1 t of mixed feeds, and its addition to the ration of cows and calves depends on the deficiency of nutrient substances( ingredients of the premix) in the ration. Taking into consideration the fact that natural plants use macro- and microelements from the soil to form the organic mass( during the process of photosynthesis) and the above elements not always correspond to the requirements of the animal body in the combination with xenobiotics dangerous for health, we offer to use the biologically active preparation from plant extracts in veterinary practice. It will promote to support equilibrium and balance in the body, to protect from the development of chronic toxemy condition and it will serve as a source of microelements, vitamins, as a bactericidal substance, antidepressant and adaptogen; as a radioprotector and as a biostimulator. To produce the preparation( by the traditional method following the rules of aseptics) the following plants are used:

1. *Schizandra chinensis*;
2. *Daucus sativus* (hoffm) roehl;
3. *Allium sativum*;
4. *Salanum laciniatum*;
5. *Matricaria chamomilla*;

6. Ephedra eduisetina bunge;
7. Senticosus (rupr. Et maxim) maxim;
8. Menthapiperita.

The biologically active preparation of the plant origin is administrated by subcutaneous ( or intramuscular) injection in the area of neck. It is administrated to cows once a week in the dose 0.1ml/kg live weight but not more than 15 ml per a cow a day, the dose is divided into 7,5ml each in the morning and in the evening, 12 hours interval; for the calves: once in three days dose is 0,3-0,6 ml/kg live weight but not more than 10 ml/a calf/a day divided into 2,5ml each in the morning and in the evening with 12 hours interval.

Premixes adapted to the real rations of cows and calves (the correction is ; caused by the extremal conditions biogeochemical zone) in combination with the synchronized use of the injection of the biologically active preparation have the protective action against heavy metals and radionucleids and, thus, improve ecological and food quality effect that is very important for the polluted biogeochemical provinces.

Having the above-mentioned plans in its composition. T-preparation contains also.

Acid as well as shizandrin, sugar, tanides. The above plans exert stimulating and tonic effect. The preparation stimulates cardio-vascular system of warmblooded animals itexcites respiration

It stimulates the central nervous systems, promotes neuro-muscular excitement that is very important when the body is intoxicated by xenobiotics. The chemical substances - caratynoids: carotin, phytoen, phytophluen, lycopin are also of great importance. Vitamins B<sub>1</sub> and B<sub>2</sub> panthoten and ascorbic acids, flavonoids, actiocianides, sugars, fatty and ether oils, umbelipherol, terpens - linalool, 1-pinen, 2-pinen, sabinen, lemonen, sesquiterpens - 1-bysabolen, bergamoten, dautsen, unipercamphora, caratol, dancolaromatacones n-tsymol, arcurcumen, azaron, elymizin are very important. Some plants can increase diuresis, secretion and motoric function of gastroistinal tract they have bactericidic, fungicidic and anticilmentic action, decrease the level of cholesterine in blood. Some plants slightly increase arterial pressure and amplitude of heart contractions, they have antiinflama- tosy action, decrease the blood clottingperiod, exert cardiotionicaction. Ephedrin can increase arterial pressure, have positive effect on heart acnivity, increase heart volume and tonus of peripheralvessels, relax smooth muscles of bronchs, stimulate respiration centre. Eleuterocock, its roots and stem, contain derivatives of cumarin, but its leaves and flowers contains-derivatives of flavonoids. More than 7 eleu- terosides have been revealed. The above substanceexerts multi-sided action on the jj body it excites CIXS, increases movement activity and conditioned and reflex activity, improves sight, impoves metabolism, adaptive properties of the body, reduces the level of sugar

in blood increases appetite, has honadotropic properties .It dives the feeling of activity to adult animals, presitively influences heodynamic indices.

Chemical composition of preparation 100 ml: iron - 20,2 mg, selenium - 14 mg, coniferous forest - 4,7 mg, magnesium - 6,5 mg, molybdenum - 3,6 mg, bromine -2,8 mg, calcium -32,4 mg, chrome - 3,3 mg, fluorine - 12,1 mg, sodium - 1 1,4mg, iodine - 9,8 mg, lithium - 7,7 mg, to potassium - 6,4 mg, silicon - 18,6 mg, manganese -26,9 mg, copper - 34,6 mg, zinc - 43,6 mg, nickel -5,1 mg, cobalt - 18,3 mg, vanadium - 4,8 mg was instrumental in the leadingout of heavy metals of cadmium, lead, copper and zinc from the organism of cows and influenced on normalization of the rate of ksenobyotyics in milk with the simultaneous improvement of physiological state of cows.

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### **ФІТОБІОПРЕПАРАТИ ТА АДАПТИВНІ ПРЕМІКСИ ДЛЯ ТВАРИН ЗАБРУДНЕНИХ КСЕНОБІОТИКАМИ ПРОВІНЦІЙ**

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Резюме. Обговорено застосування спеціальних преміксів в складі комбікормів та синхронізованої ін'єкції рослинного біологічно активного препарату з метою протекторної дії до хемотоксикантів і радіонуклідів для отримання екологічно безпечного молока і м'яса.



## Проблеми зооінженерії та ветеринарної медицини

Ключові слова: раціон, молоко, м'ясо, важкі метали, радіонукліди, премікси, біологічно активні препарати, екологічно безпечні харчові продукти.

ФИТОБИОПРЕПАРАТЫ И АДАПТИВНЫЕ ПРЕМИКСЫ ДЛЯ  
ЖИВОТНЫХ ЗАГРЯЗНЁННЫХ КСЕНОБИОТИКАМИ ПРОВИНЦИЙ  
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Резюме. Обсуждены применения специальных премиксов в составе комбикормов и синхронизированной инъекции растительного биологически активного препарата с целью протекторного действия до хемотоксикантов и радионуклидов для получения экологически безопасного молока и мяса.

Ключевые слова: рацион, молоко, мясо, тяжелые металлы, радионуклиды, премиксы, биологически активные препараты, экологически безопасные пищевые продукты.

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