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THE INFLUENCE OF DRUGS WITH IMMUNO-CORRECTIVE AND BIOCIDAL EFFECTS DURING THE CULTIVATION OF BROILER CHICKENS ON THE MORPHOFUNCTIONAL STATE OF ORGANS

ВПЛИВ ПРЕПАРАТІВ ІМУНО-КОРИГУВАЛЬНИХ ТА БІОЦИДНОЇ ДІЙ ПРИ ВИРОЩУВАННІ КУРЧАТ-БРОЙЛЕРІВ НА МОРФОФУНКЦІОНАЛЬНИЙ СТАН ОРГАНІВ

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Abstract *The results of the study of drugs with immuno-corrective and biocidal effects, which can be effectively used in the conditions of poultry farming, are presented. It was established that in experimental birds, the combined use of the symbiotic drug "Biomagn" with feed, the probiotic agent "Biozapin" by spraying and the complex of biocides "Diolaid" for the water supply system, disinfection "Biolaid" in their presence contributes to better assimilation of compound feed and a gradual increase in weight bodies of chickens, in relation to the control. Bird conservation in all groups is 100%. During the patho-anatomical evaluation of COBB-500 cross-breed slaughter broiler chickens, aged 42 days, of the control group I and II experimental groups, no deviations from physiological norms were found, all the examined organs retained their characteristic anatomical*

structure, were physiologically developed in accordance with their age, their position was anatomically correct, their integrity was preserved . The following pathological and anatomical diagnoses were revealed: myocardiodystrophy, granular dystrophy of the liver, proventriculitis, catarrhal enteritis, involution of the bursa and thymus gland. The detected changes in the heart muscle of control group chickens may indicate the development of myocardiodystrophy, which may be associated with a violation of metabolic processes in the bird's body. Given the presence of inflammatory changes in the intestines and glandular stomach, impaired absorption can lead to a lack of micro and macro elements in the body. In particular, selenium and vitamin E. A slight violation of the absorption of these substances can lead to the development of dystrophic changes in the heart muscle, and later, to the development of myopathic changes.Dystrophic changes in the liver of broiler chickens of the control group may be associated with a complex of etiological factors, the combined effect of which causes a cascade of pathological reactions in the bird's body.

Key words: *lymphoid follicle, broiler chickens, hyperplasia, immunoreactivity, fermentation*

Introduction.

The strategy of prevention of infections in industrial poultry farming is based on a set of measures aimed at effective neutralization of pathogens at any stage of their development. The wide range of products of the domestic pharmacological industry indicates the high potential of Ukrainian manufacturers of animal protection products. Some scientists recommend using probiotic preparations based on a mixture of Bacillus bacteria, etc., both with addition to standard feed and for the purpose of spraying in the room in the presence of broiler chickens, in order to increase the preservation, productivity and correction of the immune system [6].

Recently, in order to improve the technological process of growing broiler chickens, researchers recommend using a system of a complex of disinfectants and probiotics. In this regard, there is a need to identify and investigate changes in the body of birds, both with a standard breeding scheme and with the use of modern drugs for introduction into production [1, 2, 6].

Main text.

The purpose of the research is to conduct a patho-anatomical evaluation of COBB-500 cross-breeding broiler chickens, aged 42 days, which were fed standard diets and a system of a complex of disinfectant and probiotic preparations developed by employees of the State Research Institute for Laboratory Diagnostics and Veterinary-Sanitary Examination.

The experiment was conducted in the vivarium of the State Research Institute for Laboratory Diagnostics and Veterinary-Sanitary Examination. Groups of broiler chickens formed by the method of analog groups were selected: 2 experimental and 1 control group (n=21) of COBB-500 cross broilers in the number of 63 heads, aged 5 days. The bird was fed complete ration compound feed "Starter" (first 14 days) and "Grover" until the end of the experiment. Experimental groups I and II were fed compound feed with the addition of the symbiotic drug "Biomagn" from the 1st to the 7th and from the 22nd to the 27th day of cultivation at the rate of 0.5 mg per kilogram of compound feed. At the same time, the broilers of the experimental group were given a solution of "Diolide" (based on chlorine dioxide) 1.0 mg/l per chlorine dioxide, which corresponds to a concentration of 0.0004%, with water throughout the experiment.

In the scheme of technological cultivation, disinfection was applied in the premises in the presence of poultry with the biocidal preparation "Biolaid" 0.2% (based on hydrogen peroxide, perlactic acid, lactic acid) with an exposure of 60 minutes. Then,

2 days after disinfection, the probiotic "Biozapin" based on a mixture of probiotic bacteria Bacillus sybtilis, Bacillus amyloliquefaciens and aluminosilicate was evenly sprayed in the room at the rate of 10-30 g/m2 once every 2 weeks. The control group was grown without the use of disinfectants in the premises according to the following scheme (Table 1)

Table 1 - Scheme of application of symbiotic with probiotic and in combination with biocidal drugs in experimental conditions on broiler chickens (n=63)

Drugs/ Concentration	I research group (probiotics) (n=21)	II research group (probiotics + biocides) (n=21)	Control group (n=21)
1	2	3	4
"Biomagn"	(1-7), (22-27) day	(1-7), (22-27) day	-
«Біозапін»	7; 22 day	7 ; 22 day	-
"Diolaide"/ 0,0004 %	-	During the experiment	-
"Biolaid"/ 0,2 %	-	1p/ week	-
Antibiotics	-	-	(5-10) day
Vitamins	-	-	(5-10) day

Visual observation during the entire period of the experiment did not reveal any changes in the behavior and intake of food in both experimental and control groups. More active consumption of water by birds of the I and II experimental groups was noted.

The dynamics of changes in body weight and survival of chickens were determined on the 5th, 10th, 20th, 30th, 40th, and 42nd days of the experiment. It has been established that in experimental birds, with the combined use of the symbiotic drug "Biomagn" with feed, the probiotic agent "Biozapin" and the complex of biocides "Diolide", "Biolide" contributes to a gradual increase in the body weight of chickens, in relation to the control, which probably occurs due to better assimilation of compound feed. Namely, on the tenth day of rearing, birds of the 2nd experimental group exceeded their peers in the control group by 0.054 kg or 15% in terms of live weight. The lowest live weight (0.355 kg) was observed in the first experimental group at this stage of growing compared to the control and second experimental groups. It should be noted that already on the 20th day of cultivation, the experimental groups fed the symbiotic drug "Biomagn" differed significantly in live weight: the first experimental group exceeded the control by 9.7% and the second experimental group by 12.9%. Since the introduction of the symbiotic drug "Biomagn" into the diet was carried out from the 1st to the 7th day of cultivation, such a difference in live weight between the experimental and control groups indicates a high level of prolonging effect of the specified drug [3, 5, 8, 11] . This fact is confirmed by the difference in live weight and after the end of fattening of the bird in 42 days (and the drug was received from the 22nd to the 27th day).The final live weight in the control group was 2.380 kg, in the first experimental group it was probably higher by 0.350 kg ((14%) and in the second by 0.430 (18.1%). At the same time, the preservation of birds in all groups was 100%,

which is likely is a positive result of using Diolaid as a bird drinker and carrying out disinfection. During the patho-anatomical examination of slaughtered broiler chickens of the COBB-500 cross of the control group, aged 42 days, it was established**:** The condition of the skin is white-yellow, moderately moist, thin, without tears and damage. The plumage is white, well kept in feather follicles. Subcutaneous tissue - well developed, intensive accumulation (presence) of moderately moist fat of yellowish color, soft consistency. The vessels are moderately filled with dark cherry-colored blood.

Skeletal muscles - muscles are well developed, uniformly colored, pale pink, moist, elastic. The muscle pattern is preserved, without swelling and hemorrhages. Intermuscular connective tissue without visible changes. The state of the bone system - the bones are well developed, the periosteum is shiny, no fractures or deformations of the bones were detected.

In the vast majority of slaughter birds, the thymus gland has no visible pathological changes. However, among the others, it was found to be of the usual shape, the capsule is slightly wrinkled, soft consistency. The color is pale pink, slightly lighter in some areas. The lobes are heterogeneous in size, surrounded by a sufficient amount of fatty tissue. The demarcation between the cerebral and cortical zones is not clear, somewhat smoothed.

In the vast majority of slaughter birds, the heart without visible pathological anatomical changes is cone-shaped, the myocardium is uniformly colored pink-red. The pericardium is thin, smooth, shiny. On the epicardium, deposition of fat is yellowish in color. Coronary vessels are moderately filled with blood. However, the following pathomorphological changes characteristic of myocardiodystrophy were found among other subjects. The heart is cone-shaped, unevenly colored in gray-red color. The pericardium is thin, smooth, shiny. On the epicardium, deposition of fat is yellowish in color. The myocardium is grayish-reddish in color, gray in places, flaccid in consistency, the cut surface is dry. There is no blood in the cavities of the ventricles. The heart valves are elastic, thin, adhesions and layering were not detected. Accumulation of blood clots in the auricles (Fig. 1, 2).

Fig. 1. Myocardiodystrophy.

The lungs are of the correct shape, the parts are symmetrically developed, the lobes are clearly defined, soft consistency, uniformly colored in pink-red color, elastic.

The pattern on the section is preserved, the ratio of parenchyma and stroma is correct, the color on the section is pink-red. The liquid flowing from the cut surface is pinkish-red in color. The vessels are filled with blood. In Galen's test, a piece of lung floats freely at the water level. Seals and hemorrhages are not observed.

Internal organs are physiologically developed according to age, the position is anatomically correct, there are no extraneous contents, all organs are intact. The spleen is round in shape, not enlarged, the capsule is not tense, shiny, smooth, elastic, dark brown in color, flabby consistency, the pattern is preserved, trabeculae and follicles are clearly visible on the section, the pulp is dark red, with pronounced granularity, moderately filled with blood , scraping of the pulp is insignificant.

Fig. 2. The heart. Cut surface. Accumulation of blood clots in the auricles

In the majority of slaughter birds, the liver has no visible patho-anatomical changes - it is not enlarged in volume, the edges are pointed, the capsule is slightly strained, colored brown, the cut surface of the liver is shiny. However, in other subjects, the liver was in a state of dysproteinosis (granular dystrophy) - slightly increased in volume, the edges are blunt, doughy in consistency, the capsule is tense, poorly separated from the parenchyma. The surface is unevenly colored in a grayish-brown color, areas of dark brown color border with areas of light yellow color, the surface of the section has a dull shade, moderately filled with blood, scraping of the pulp in the form of a dark loose mass.

In the vast majority, the glandular stomach is in a state of inflammation (proventriculitis) - there is no content, patency is preserved, the mucous membrane is somewhat swollen, reddened, and peels off easily. The surface is uneven, the color is grayish with red veins. The glands are enlarged. When pressing on the glands, a cloudy gray-white substance of a viscous consistency is released from the ducts. Although part of the studied bird has a glandular stomach without visible pathological anatomical changes - the patency is preserved, the contents are absent, the mucous membrane is pale pink in color, peels off and is lightly covered with gray-white mucus.

The muscular stomach is round in shape, the consistency is elastic, the stomach is filled with food masses. The cuticle is easily removed, the mucous membrane under the cuticle is pale pink, moist and homogeneously colored. Patency is preserved. The

muscular membrane is uniformly colored in dark red color, the serous membrane is dark pink. In the newness of deposition around the stomach fat.

The small intestine is mostly in a state of inflammation - the position is natural, the serous membrane is gray-pink in color, a small amount of foamy yellowish liquid and undigested feed remains are found in the lumen, patency is preserved. The mucous membrane is dull, swollen, covered with a thick layer of mucus, the color is uneven, the color varies from gray to gray-pink, with reddish areas appearing in between. The presence of single point hemorrhages.

At that time, the small intestine of some people is in a state of physiological norms - the situation is natural, the serous membrane is gray - pink in color. In the cavity there is a small amount of fodder mass, the pale pink mucous membrane is covered with gray-white mucus. Large intestine - the position is natural, correct, slightly filled, patency is preserved. The serous membrane is pale pink, the mucous membrane is pale pink, covered with mucus. Kidneys – accumulation of perirenal fat, the position is natural, the shape and structure are preserved. Slightly increased in size (slightly beyond the vertebral pits), the consistency is dense, the surface is bumpy, unevenly colored, the color varies from light gray and brown to dark brown. The capsule is somewhat tense. Which indicates the presence of dystrophic changes. In the majority of studied birds, the bursa of Fabricius is somewhat reduced in volume, oval in shape, loose in consistency, the mucous membrane is somewhat swollen, dull.

In addition, after a macroscopic examination of the chickens, involution of the immunocompetent organs - the thymus and Bursa of Fabricia - was revealed. One of the etiological factors in the development of such a condition is zinc deficiency, which leads to impaired T-lymphocyte differentiation and contributes to the development of immunosuppressive conditions. In our case, the early involution of immunocompetent organs probably develops due to impaired digestive functions in the bird and due to the development of inflammatory processes in the glandular stomach and intestines [4, 9, 10, 12].

The obtained data lead to the opinion that disturbances of metabolic processes in the organs of empty abdominal birds under normal conditions of keeping (without the influence of disinfectants and probiotics) begin with disturbances of metabolism at the cellular level at the very early stages of its growth and development. These facts are confirmed by the results of previously conducted microbiological studies, when all the identified main indicators remained normal.

Conclusions.

1. The use of a complex of disinfectant and probiotic preparations optimizes the process of formation of elements of immunocompetent cells and inhibits the early involution of organs of the immune system, which leads to a more active formation of the cellular and humoral link of immunity.

2. The use of a set of probiotic cultures instead of antibiotics during the fattening stages of broiler chickens performs a protective function and enables the development of the natural intestinal microbiota of the bird, includes replacement and protective mechanisms that reliably resist dysbiosis of infectious etiology with diarrhea and respiratory syndrome, which allows obtaining bio-safe m´ clear, high-quality products without residual amounts of antibiotics.

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Анотація. *Наведені результати дослідження препаратів імуно-коригувальних та біоцидної дій, які можна ефективно використовувати в умовах птахівничого господарства. Встановлено, що у дослідної птиці за комбінованого застосування їм симбіотичного препарату «Біомагн» з кормом, пробіотичного засобу «Біозапін» шляхом розпилення і комплексу біоцидів «Діолайд» для системи водопостачання, дезінфекції «Біолайд» у їх присутності сприяє кращому засвоєнню комбікорму та поступовому збільшенню маси тіла курчат, по відношенню до контролю. Збереженість птиці у всіх групах 100 %. При проведенні патологоанатомічної оцінки забійних курчат-бройлерів кросу COBB-500, віком 42 дні контрольної групи I та II дослідних груп не встановлено відхилень від фізіологічних норм, всі досліджувані органи зберігала характерну анатомічну будову фізіологічно розвинені відповідно до віку, положення їх анатомічно правильне, цілісність збережена. Виявлено наступні паталого-анатомічні діагнози: міокардіодистрофія, зерниста дистрофія печінки, провентрикуліт, катаральний ентерит, інволюція бурси та вилочкової залози. Виявлені зміни у серцевому м'язі, курчат контрольної групи, можуть свідчити про розвиток міокардіодистрофії, що може бути пов'язане із порушенням обмінних процесів в організмі птиці. Враховуючи наявність запальних змін у кишечнику та залозистому шлунку, порушення всмоктувальної здатності може призводити до нестачі в організмі мікро та макро елементів. Зокрема селену та вітаміну Е. Незначне порушення всмоктування даних речовин може призводити до розвитку дистрофічних змін серцевого м'язу, а в подальшому, до розвитку міопатичних змін. Дистрофічні зміни у печінці курчат бройлерів контрольної групи можуть бути пов'язані із комплексом етіологічних чинників, сукупна дія яких викликає каскад патологічних реакцій в організмі птиці.*

Ключові слова: *курчата-бройлери, пробіотик, біоцид, імунореактивність, ферментизація, провентрикуліт, вилочкова залоза, печінка.*