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Efficiency Of The Use Of Biologically Active Additives In Broiler Poultry.

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ABSTRACT

At a certain period of development, a bird needs biologically active substances, on the consumption of which its productivity depends. It should be noted that the rational use of dietary supplements in the rations of broiler chickens has a positive effect on metabolic processes in the body. As a result of the use of these drugs increases productivity and increases the profitability of poultry products. Therefore, for the normal growth and development of poultry, increasing its productivity and natural resistance, it is necessary to use biologically active substances, which include caroflavin and eleutherococcus extract. The aim of our work was to study the possibility of using karoflavin and eleutherococcus extract in broiler chickens rations to increase their growth and natural resistance. As a result of the conducted research, high growth-promoting activity and bioavailability of Karoflavin and Eleutherococcus as well as their hepatoprotective properties were established. After the use of Karoflavin and Eleutherococcus, the average daily gains of broiler chickens increased by 5.5 and 4.9%, the serum bilirubin level decreased by 23.0 and 22.6%, the aspartate aminotransferase activity decreased by 15.7 and 10.3%, the activity of alanine aminotransferase decreased by 2.8 and 5.9%, the activity of lactate dehydrogenase decreased by 16.4% after administration of caroflavin, and 16.7% after feeding of eleutherococcus. The phagocytic activity of pseudo-eosinophils after feeding caroflavin increased by 19.9%, after feeding out Eleutherococcus - by 21.5%. Karoflavin is proposed to be introduced into the rations of broiler chickens at the rate of 1.0 g / kg of body weight and extract of Eleutherococcus - at a dose of 0.5 ml / kg of body weight during the entire period of poultry raising to increase growth rates, natural resistance and prevention of hepatitis

Keywords: Caroflavin, carotene, vitamins, larch bioflavonoid complex, Eleutherococcus broiler chickens, rations, natural resistance.

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INTRODUCTION

Both in our country and in the whole world, poultry farming is one of the leading branches of animal husbandry, providing the population with high-value food. This industry is developing rapidly, is economically viable, has no seasonality and meets the population's need for meat throughout the year. The quantity and quality of poultry products in this case is determined by the conditions of feeding and housing of the bird, its breed, age, body condition and other factors. Great importance is also attached to the greening of the products [5].

It is known that in the process of growing and maintaining productivity, the poultry is exposed to various stressors, such as: changing diets and feeding rhythms, non-compliance with regulatory indicators of the microclimate, infection with infectious, invasive and non-communicable diseases, is subjected to veterinary treatments, which entails a weakening of immunity, a decrease productivity and increased mortality [13].

In the process of adaptation to the extreme conditions of existence, during stresses and various diseases in the body of the bird, there is a deficiency of vitamins and other biologically active substances. This deficiency constrains adaptation mechanisms, giving rise to a kind of "circle". By prescribing ergotropic agents and adaptogens, and sometimes by stimulating the body, it is possible to disconnect it [15].

The additional introduction of biologically active substances of directional action into the poultry feed ration is a significant factor in increasing their productivity and preservation. Properly formulated diet for animals has no less importance than their genetic origin. Therefore, it is necessary to take into account not only the nutritional value of feed ration, but also the presence of biologically active substances in them [4].

Today poultry farmers have accumulated a significant amount of experimental data on the effective use of various biologically active and non-traditional additives for poultry [7].

Eleutherococcus is one of the known adaptogens. It has been proven to have a positive effect on the growth and development of animals, the egg production rate of birds and the increase in live weight, increased resistance to pathogens and other parameters of productive animals [6].

To increase the productivity of broiler chickens under production conditions, various biologically active substances, in particular vitamins and provitamins, are often used. Carotene-containing preparations have a high efficiency, the use of which corrects the A-vitamin nutrition of poultry and increases some factors of nonspecific protection of the body [4].

The immunostimulating role of carotenoids has been established. They increase the cytostatic activity of T-killers, slow down tumor growth and accelerate the processes of tissue repair, contribute to the economical expenditure of antioxidant vitamins and enzymes, exhibit anti-stress properties [1].

It should be noted that the usefulness of A-vitamin nutrition of animals depends on the intake of carotene and vitamin with feed, as well as on the efficiency of their assimilation, availability and size of tissue stocks [14].

Our observations show that it is very difficult to balance rations on carotene content only with the help of feeds rich in this provitamin, and if you take into account the large energy costs for the production of grass meal, it is also economically expensive. More reliable results are given by adjusting the rations of carotene preparations [9].

Considering the above, employees of ZAO Petrokhim (Belgorod) developed a new carotene-containing drug Caroflavin. The drug is a complex compound, which includes beta-carotene (3.3 mg / g), larch bioflavonoid complex (20 mg / g), vitamin A (500 IU / g), vitamin Dz (250 IU / g) and vitamin E (0.2 mg / g).

The aim of our work was to study the effect of Karoflavin on the productivity and natural resistance of broiler chickens in order to offer this drug as a means of stimulating the growth of poultry, as well as compare its effect with the extract of Eleutherococcus spiny.

MATERIALS AND METHODS

The object of the study was caroflavin. The drug was developed by employees of JSC "Petrokhim" (Belgorod).

The study of Karoflavin and Eleutherococcus was performed on broiler chickens. The nature of the effect of drugs on the body of the bird was judged by the biochemical parameters of blood. Taken into account the safety of livestock and average daily gains.

Blood was taken from the axillary vein. Biochemical parameters were determined by standard methods. At the same time, the Hitachi hematology analyzer was used.

The serum lysozyme activity was determined by the Dorofatechuk nephelometric method [2], phagocytic activity - by counting phagocytic neutrophils from 100 cells, the bactericidal activity of the blood serum - according to IM Carpath, [3].

The research results were subjected to mathematical processing with the calculation of arithmetic averages (M), their average statistical errors (m) and the reliability criterion (p); digital data was evaluated using the Fisher-Student test.

RESULTS AND DISCUSSION

To assess the effect of Karoflavin and Eleutherococcus on the body of broiler chickens on the principle of analogs, 3 groups of 10-day-old broiler chickens with 50 goals each were formed.

The first group was the control group, the second group was used with caroflavin feed, the third group - with water Eleutherococcus. The experiment lasted for 20 days according to the scheme of the experiment presented in table. 1.

Table 1 - Scheme of experience on broiler chickens

Groups	Used drugs	Dose
1 control	-	-
2 experienced	caroflavin	1.0 g / kg feed
3 experienced	Eleutherococcus	0.5 ml / kg body weight

As a result of the research conducted, the positive effect of both studied drugs on the bird organism was established (Fig. 1).

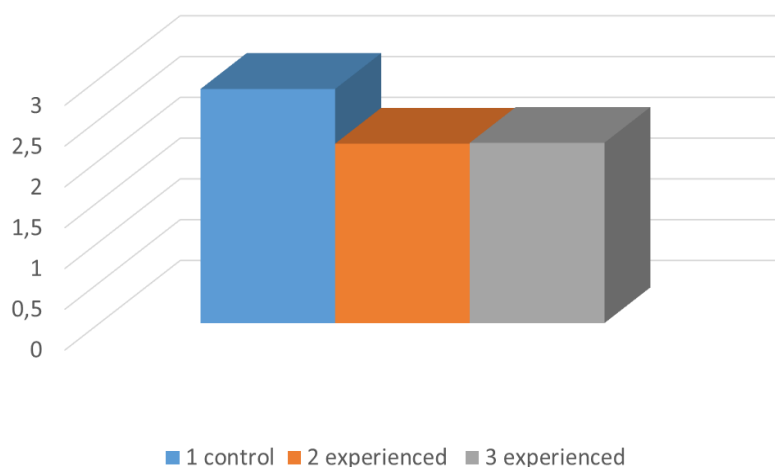


Figure 1 - Average daily growth rate of broiler chickens

From the data presented in the figure it is clear that the use of both studied drugs had a positive effect on the growth and preservation of the bird. So, after the use of Karoflavin, the average daily gains of broiler chickens exceeded the benchmarks by 5.5%, after feeding out Eleutherococcus - by 4.9%.

Safety in both experimental groups was 98%, while in the experimental group it was 96%.

The study of the biochemical composition of the blood of chickens showed a significant difference between the control and experimental groups.

After application of Karoflavin and extract of Eleutherococcus (Fig. 2), the serum of the second and third experimental chickens decreased bilirubin by 23.0 and 22.6%, respectively (the difference from the control was confirmed statistically: $p < 0.05$).

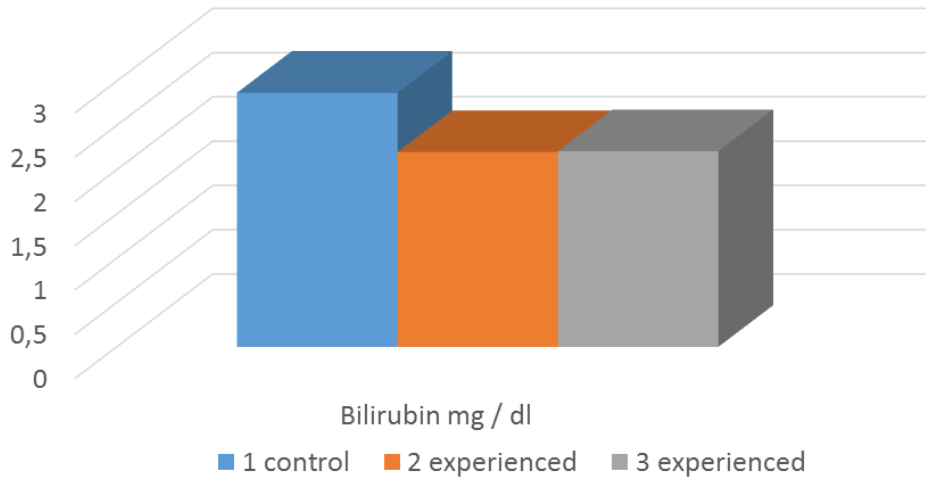


Figure 2 - Serum bilirubin content

At the end of the experimental period, a decrease in the activity of aspartate aminotransferase was also noted: after the use of caroflavin, by 15.7%, after feeding of eleutherococcus, by 10.3% (Fig.3).

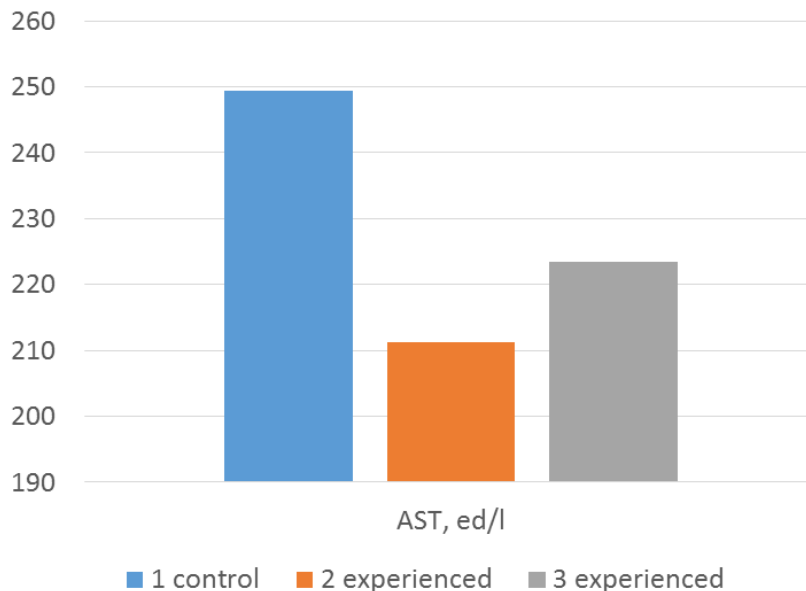


Figure 3 - Aspartate aminotransferase content in serum

The activity of alanine aminotransferase also decreased after the use of both drugs: by 2.8 and 5.9%, respectively, compared with the control (Fig. 4).

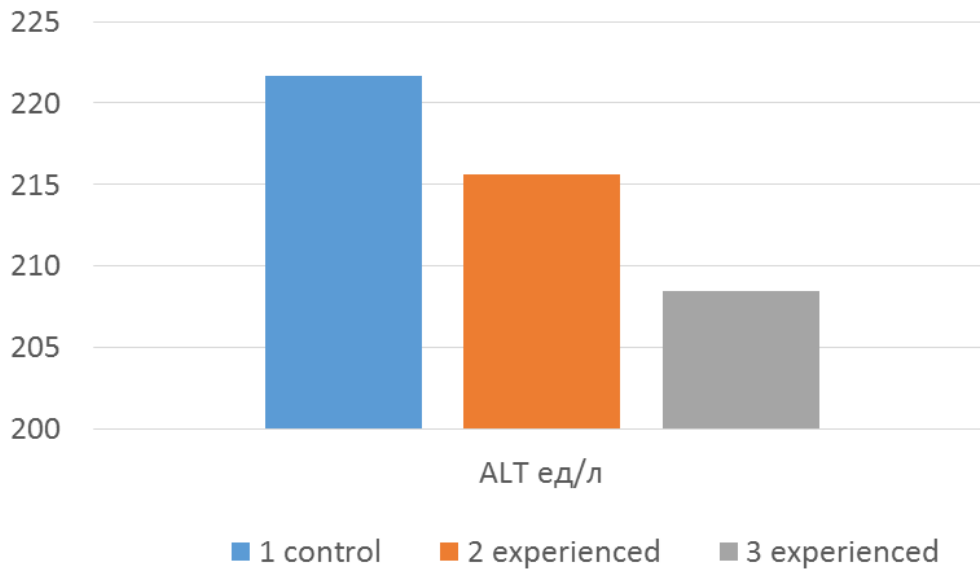


Figure 4 - The content of alanine aminotransferase in serum

The activity of lactate dehydrogenase (Fig. 5) after the use of caroflavin decreased by 16.4%, after feeding of Eleutherococcus - by 16.7%. In all cases, changes with control were statistically significant ($p < 0.05-0.01$).

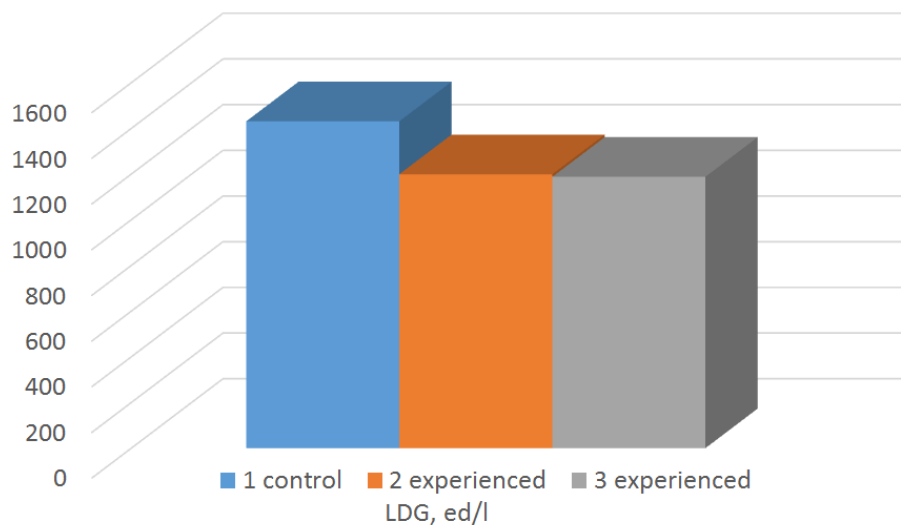


Figure 5 - Serum lactate dehydrogenase

The decrease in the activity of organ-specific enzymes and bilirubin in the blood serum of birds indicates a hepatoprotective effect of caroflavin and eleutherococcus.

The positive effect of caroflavin on the liver function of broiler chickens can be explained by the high pharmacological efficacy of the drug and the synergism of its ingredients.

First, the antioxidant effect of the larch bioflavonoid complex has a significant effect on the restoration of the function of hepatocytes. Under the action of flavonoids, the expression of such enzymes as catalase, superoxide dismutase, glutathione peroxidase, etc., is increased. Thus, one of the most amazing flavonoid abilities is found to normalize the metabolism of normal cells if it is disturbed, but at the same time kill cancer cells by disrupting their metabolism. This is probably achieved through the activation of the natural defense mechanisms of the organism, developed in the process of evolution.

In addition, vitamin E, which is part of both drugs - is the main antioxidant protection that protects and strengthens cell membranes. Being a kind of trap for free radicals, plays a significant role in the functioning of the antioxidant protection of the whole organism [11, 10]. At the same time, only reduced forms of vitamin E are involved in the inhibition of lipid peroxidation, and ascorbic acid is the reducing agent of tocopherol's antioxidant properties. Vitamin E effectively interacts with free radicals of lipids and inhibits lipid peroxidation processes [16].

All natural antioxidants exert their protective effect together, therefore a reduction in the content of one will entail a violation of the entire antioxidant protection as a whole [12, 8].

At the next stage, we studied the effect of Karoflavin and Eleutherococcus on some indicators of natural resistance (Fig. 6).

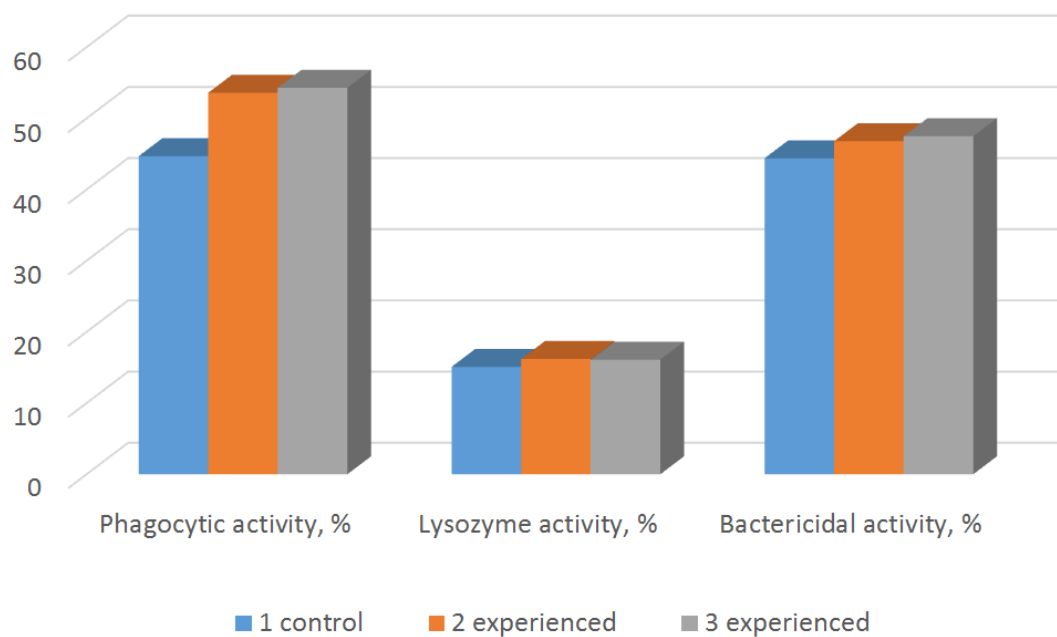


Figure 6 - Indicators of natural resistance of broiler chickens

From the data presented in the figure it is clear that both studied drugs contributed to a significant increase in the phagocytic activity of pseudoosinophils. After the use of Karoflavin, the phagocytic activity increased by 19.9%, after feeding out Eleutherococcus - by 21.5%. In all cases, the difference with the control was significant ($p < 0.05$).

It should also be noted the trend of increasing bactericidal and lysozyme activity after the use of both studied drugs. But these changes did not have statistical confirmation with controls.

Thus, our studies have shown that caroflavin and eleutherococcus has high pharmacological activity. It increases some of the factors of the natural resistance of the organism and, as a result, increases the average daily gains and safety of broiler chickens.

CONCLUSION

Studies have shown a high biological availability of both drugs and their positive effect on the physiological state of the bird, which consists of improving the liver and increasing the natural resistance of the body. Broiler chickens are advised to use caroflavine with feed at a dose of 1.0 g / kg body weight and Eleutherococcus extract with water at a rate of 0.5 ml / kg body weight during the entire period of poultry raising to increase growth rates and natural resistance from 10 days of age. and normalization of the liver



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