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BLOOD INDICES OF BROILER-CHICKENS AFTER SUPPLEMENTING THEIR DIET WITH SOLUTIONS CONTAINING B-GROUP AND L-CARNITINE VITAMINS

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Abstrakt

The authors present the research results of the influence of aqueous solution of calcium pantothenate, nicotinamide, cyanocobalamin, folacin and L-carnitine influence on the dynamics of morphological and biochemical blood indices of broiler-chickens in the condition of industrial technology of chicken raising.
Key words: broiler-chickens; diet, dietary supplement; erythrocytes and leucocytes; blood pigment; blood serum protein.

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ПОКАЗАТЕЛИ КРОВИ ЦЫПЛЯТ-БРОЙЛЕРОВ ПОД ДЕЙСТВИЕМ ВВЕДЕНИЯ В ИХ ДИЕТУ РАСТВОРА ВИТАМИНОВ ГРУППЫ В И L-КАРНИТИНА

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Аннотация

Представлены результаты исследования влияния водного раствора кальция пантотената, никотинамида, цианокобаламина, фолиевой кислоты и L-карнитина на динамику морфологических и биохимических показателей крови цыплят-бройлеров в условиях промышленной технологии их выращивания.
Ключевые слова: цыплята-бройлеры, диета, биологически активная добавка, эритроциты и лейкоциты, гемоглобин, белки сыворотки крови.

Relevance. In the industrial poultry farming, which is connected to its isolation from the natural sources of feeding, vitamins, especially the vitamins of B-group, play an important role [3]. An attempt to understand the influence of vitamin and L-carnitine combination on broiler-chickens growth and evolution, the morphological and biochemical blood indices [1, 2, 4, 5] and on the base of this an opportunity to give a characteristics of metabolic processes in the poultry organism were taken for the first time [6, 7].

The purpose of the work. To fix a morphological and biochemical modifications of blood characteristics of intensively growing chickens using an aqueous solution of vitamins B-group and L-carnitine fluid (commercial preparation «Vitogon», produced by LLC «Belfarmacom», Russia).

Materials and methods of the study. The test was conducted on the broiler-chickens of the cross "Hubbard" in the period from 1 to 41 days of age. The experimental setup, feeding and used doses of the drug "Vigoton" in the diets of broilers are presented in Table 1.

The study of morphological and biochemical parameters of the birds' liver was determined by standard techniques, using the equipment accredited in the testing laboratory at Belgorod State Agricultural University named after V. Gorin.

The results of research. It was revealed, that the concentration of erythrocytes and leucocytes, and hemoglobin contents of all groups of birds were within the physiological standard. On the 21st day of the experiment, under the influence of the drink preparation «Vitogon», the concentration of blood pigment in the second and fourth groups of chicken-broilers has become actually less in comparison with the birds in the control group (Table №1). These modifications from the biological point of view, are not significant, don't create problems in provision of tissues and organs with oxygen, and in eliminating CO_2 and hydrogen proton.

In the 2nd and 3d groups of chickens, the concentration of blood pigment was actually 4.5 and 5.8 % less accordingly, in comparison with the control group. Besides, these distinctions are not significant and might be explained by unavoidable errors which occur in the receipt process of whole blood and realization of analytical procedures.

Table 1

Hematological indices of broiler-chickens on the 21 and 41 days of growth (n=5)

Index	Age, days	Number of test group			
		1	2	3	4
Hemoglobin, g/l	21	91.7±1.41	87.2±0.58*	89.0±1.13	86.4±0.56*
	41	96.7±2.21	106.2±8.53	93.5±3.32	102.6±4.13
Erythrocyte, 10^{12}/l	21	2.8±0.28	2.7±0.18	2.3±0.14	2.2±0.10
	41	2.9±0.24	2.8±0.29	2.6±0.31	2.8±0.41
Leucocyte, 10^9/l	21	39.6±2.91	41.2±3.09	39.6±4.11	42.1±5.18
	41	39.8±5.21	40.1±7.11	40.1±4.99	41.4±3.80

*Here and further on: *p<0.05; **p<0.01; ***p<0.001*

On the 41 day, the level of the blood pigment of broiler-chickens in the 2nd and 4th groups was 9.8 and 6.1% higher in comparison with the control group accordingly. Despite the big difference, the true distinctions in this case were not detected.

The modification of the concentration of erythrocytes and leucocytes, as on the 21st and 41 days, doesn't significantly differ in the groups. The research results of some characteristics of the amino acid metabolism are listed in Table №2. The concentration of total protein of blood serum was mostly on the same level in all broiler-chickens groups.

We should note, that using the «Vitogon» preparation has slightly increased the concentration of total protein and the level of albumen. It's well known, that serum albumin is an important source of amino acids, which is important for biosynthesis of muscle proteins. Taking into account the experimentally proven increase of body weight gain in the 2nd and 4th groups of chickens, we may conclude that such modifications are a biochemical

base of the growth and improvement of development.

The discussion of obtained results regarding γ-globulin is always sophisticated, as its increase may be estimated dually: as an immunity strengthening or defense reaction on the action of different factors of the external environment (infections, inflammatory processes etc.) Nevertheless, we recognized the tendency of γ-globulin decrease in the blood serum of chickens in test groups. We also individually determined the concentration of Ig immunoglobulins, which was truly lower in chickens receiving «Vitogon». Thus, we may conclude that the preparation used in the study has immune-protective characteristics.

Table 2

The concentration of serum proteins in the blood of chickens (n=5)

Index	Age, days	Number of test group			
		1	2	3	4
Total protein, g/l	21	39.2±0.31	40.8±0.49	41.1±0.31	42.0±0.70
	41	40.1±0.32	41.2±0.41	41.5±0.27	40.9±0.57
Fractions of total protein, %:					
albumen	21	40.6±1.39	42.1±1.21	41.9±0.98	42.0±1.56
	41	41.8±1.22	41.5±1.43	42.1±1.65	42.2±1.27
α-globulin	21	21.1±0.84	20.4±0.29	21.9±0.34	22.6±0.67
	41	23.3±0.69	21.7±0.71	22.7±0.66	22.9±1.05
β-globulin, %	21	14.6±0.38	15.4±0.41	14.9±0.56	14.5±0.49
	41	14.8±0.69	17.2±0.51	15.3±0.98	13.6±0.70
γ-globulin	21	23.7±0.99	22.1±1.03	21.3±0.67	20.9±0,79
	41	20.1±0.24	19.6±0.78	19.9±1.41	21.3±0.82
The coefficient of albumen/globulin	21	0.68	0.73	0.72	0.72
	41	0.72	0.71	0.73	0.73

The conclusion. The peroral use of calcium panteona, niacinamide, cyanocobalamin, folacin and L-carnitine («Vitogon» preparation) has a positive influence on the processes of hematopoiesis and proteometabolism, which contribute to an intensive growth of broiler-chickens.

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