

HEMATOLOGICAL INDEXES AND EXCHANGE OF MATTERS OF LAYER AT FEEDING OF GLYCINAT OF TRACE ELEMENTS

Alla Sikach, Nikolay Zakharenko, Lyudmyla Malyuga, Vita Mykhalska, Larisa Shevchenko, Vasiliy Polyakovskiy, Inna Kurbatova

ABSTRACT

It is indicated on the prospect of the use in feeding of glycinats copper, zinc, iron, cobalt and manganese, by comparison to the sulfates of these trace elements. It is set of that feeding the layer of glycinats of these trace elements was instrumental in the increase of intensity in the processes of formation of blood organs, provided constancy of indexes of exchange of matters in fabrics.

Keywords: glycinats copper, zinc, iron, cobalt and manganese, layer, blood, metabolism

INTRODUCTION

Searches of new natural growth factors of animals in place of forage antibiotics are one of priority scientific directions of domestic and foreign researchers (**Ефективне птахівництво та тваринництво, 2004**). Because is suggested to use new forms trace- and macroelements, vitamins, difficult carbohydrates, organic, preparations which improve digestion and absorption of nutritive (enzymes, extract of plant, essential oils and others like that).

It is known that at optimum maintenance and correlation of trace elements in sterns the high level of reactions of metabolism is arrived in organism which provides the normal state of health and high yield of animals. At of failing, surplus or violation of content and correlation of trace elements, in sterns various diseases develop for animals, their productivity goes down and the term of exploitation diminishes. The lack of trace elements in sterns is more frequent all compensated due to introduction in feed mixture of inorganic salts of trace elements, and level of mastering in the organism animals is 30-40%.

An alternative for them are helate connections of trace elements with amino acid. Influence of these connections on the organism of bird substantially differs from the action of inorganic salts and very near to the natural biocomplexes.

Consider that mechanism of action of helate connections is related to their participating in biochemical processes, and by ability to form soluble complexes in fabrics. At the same time the inorganic forms of trace elements cause education in the intestine of insoluble complexes, as and result of what these elements can not be used an organism and hatch with and dung (**Хьюз М., 1983**).

The purpose of researches is research of hematological indexes and exchange of matters for layer at their growing on the mixed foddors from and glycinats copper, zinc, iron, manganese and cobalt.

MATERIAL AND METHODOLOGY

Experience from the study influence of glycinats copper, zinc, iron, manganese and cobalt, on hematological indexes and exchange of matters of layer of cross-country race of Bebkok B 300 is conducted in the sciences laboratory of department hygiene of animals NULES of

Ukraine. Material for researches were 50 by layer age 120 days, which were up-diffused on five groups (control and four experimental) for 10 heads in each.

During of all experience which lasted 180 days, and bird was fed with the mixed foddors which contained glycinats trace elements. Layer were retained in cellular batteries, which was equipped feeding troughs, drinking bowls and trays, for collection of eggs.

To the layer of control group accordingly requirements in nourishing and biologically active matters feeding the mixed fodder which contained the sulfates of trace elements. The of bird of experimental groups consumed the mixed fodder in which the sulfates of trace elements deputized on and glycinats copper, zinc, iron, manganese and cobalt.

Feeding the layer of control and first experimental group of connection of trace elements with the mixed fodder in doses which answered day's requirement of bird in these connections. The hens of the second and third experimental groups of glycinats trace elements feeding an amount accordingly 2 and 4 times less from and necessity, and hens of fourth groups – 2 times and greater for day's necessity bird in these elements.

During of experience controlled the conduct of bird, determined the temperature of body and breathing frequency. At the finish experience conducted the coalface of bird, took away the standards of blood for research of hematological indexes and exchange of matters.

The concentration hemoglobin in blood was determined (**Чумаченко et al., 1990**), content of glucose and urea (**Камышников et al., 2000**), drawing on the set of reagents of "Filisit diagnostics" (Ukraine). The of amount of leucocytes and red corpuscles in blood of animals counted up in the chamber of goryaeva (**Чумаченко et al., 1990**). Content of albumen in plasma of blood was determined by and biuret reagent (**Gornelly S, 1949**), concentration of total lipids – by the set of chemical reagents of firm of "Lachema", albuminous factions of plasma of blood (**Камышников et al., 2000**).

Statistical of treatment the got results was conducted, using computer technique in M. Excel,

authenticity was determined with help criterion of Student (Кокунин, 1975).

RESULTS AND DISCUSSION

Conduct of layer of experimental groups at feeding of different doses glycinats trace elements did not differ from the bird of control group layer in all groups were active, gladly consumed and feed and water. The of mixed fodder from glycinats trace elements was instrumental in positive influence on the functional state of alimentary canal, what absence testifies for the bird of experimental groups during all period of researches of symptoms of disorders digestion.

It is set that feeding the layer of the mixed fodder is from glycinats of Cu, Zn, Fe, Co of and of Mn, during 180 days in dose, which answered the requirement of bird in these trace elements (first experimental groups) instrumental in the increase of concentration of hemoglobin, amount of red corpuscles and leucocytes, in blood accordingly on 14,1; 7,4 and 61,1% by comparison to control (table 1).

Table 1. Hematological indexes of layer, M±m, n=5

Group	Indexes		
	hemoglobin, g/l	red corpuscles, T/l	leucocytes, G/l
Control	107,60±2,95	3,11±0,03	22,40±2,78
Experimental			
1	122,80±2,51*	3,34±0,03*	36,08±3,26*
2	118,60±2,46*	3,29±0,04*	32,06±3,52
3	113,20±1,95**	3,13±0,03**	26,52±1,74**
4	131,40±4,04*	3,85±0,24*	35,30±3,47*

Note (here and in next tables): * – P 0,05 by comparison to control, ** – P 0,05 by comparison to the first experimental groups.

The similar changes of hematological indexes are marked and in blood of layer the second experimental groups, which feeding glycinats trace elements in and dose less in two times than in the second groups. So, the concentration of hemoglobin in blood of this layer rose at 10,2 %, and the amount red corpuscles grew at 5,8% by comparison to control (table. 1). It is related to influence in the first turns of iron, to the copper and cobalt on the processes of formation blood.

However, by comparison to the analogical indexes of bird the first experimental groups there is concentration of hemoglobin, the amount of red corpuscles and leucocytes in blood of layer of the second experimental groups reduced accordingly at 8,5%, 6,7% and 36,0%, that possibly, it is related to diminishing of dose trace elements in the mixed fodder. For the layer of the third experimental groups, which feeding glycinats trace elements in and dose, less from day's requirement in four times, the indicated indexes of blood did not change by comparison to control.

Feeding of glycinats trace elements to the layer of dose in two times anymore than day's necessity and concentration

of hemoglobin of blood was higher on 22,1%, and amount of red corpuscles on 23,8% by comparison to control (table. 1).

It is followed notices on the whole, some growth of level of hematological indexes for the layer the first, second and fourth experimental groups, that it is related to the dose of introduction of oligoelements in feed mixture. It is explained above all things participation Fe, Cu, Co, Zn and Mn, in the processes of formation of blood and stimulant operating of these connections on metabolic processes. It is set that the indicated changes of hematological indexes the layer experimental groups had within the limits of physiology norm.

Thus, feeding the layer mixture of helats connections of microelements was instrumental in the increase of intensity blood in the processes of formation blood organs, that, possibly, it is related to the best availability for the organism of such elements as and copper, cobalt and iron.

Important description of metabolic status in organism is research row, indexes, exchange, carbohydrates, lipids and albumens which are the additional criterion estimation efficiency application indifferent connections of micro elements in feeding of bird.

It is set that feeding of layer of experimental groups during 180 days of different doses of glycinats oligoelements did not change the concentration of glucose and urinary acid, content of total lipids and squirrel, in plasma of blood by comparison to analogical indexes in control (table 2).

Table 2. Indexes of exchange of matters for layer, M±m, n=5

Group	Indexes			
	glucose, mmol/l	total lipids, g/l	total albumen, g/l	urinary acid mkmol/l
Control	11,64±0,92	3,29±0,55	53,50±3,08	468,63±45,05
Experimental				
1	12,36±0,67	2,56±0,74	55,90±1,95	487,50±46,77
2	13,18±0,36	2,96±0,82	54,90±2,62	362,50±40,50
3	13,36±0,20	2,26±0,65	54,90±1,52	337,50±26,52**
4	13,36±0,26	2,00±0,28	51,40±3,17	412,50±39,53

Value the indicated indexes of exchange matters for the layer the first, second and third experimental groups, which feeding the mixed fodders with different content of glycinats trace elements were within the limits of sizes, characteristic for this kind and age of bird.

Not found out also differences between the concentration of glucose, urinary acid, to content of total lipids and albumen in blood of chickens of

fourth experimental groups, in spite of the fact that the mixed fodder, which feeding them contained trace elements in doses which was in twice megascopic from day's requirement of bird in these elements.

The same time for the bird of the third experimental groups, which feeding mikro elements in and dose which was less in four times than in control, the decline level of urinary acid is marked on 30,8% by comparison to an analogical index in the first experimental groups. Maybe, it is specifies on high intensity of protein metabolism and leading out of nitrogen matters from an organism.

The got results of researches testify that feeding to the layer in composition the mixed fodder of glycinats copper, zinc, iron, cobalt and manganese, provided constancy of indexes exchange matters in fabrics.

CONCLUSION

It is set as and result of the conducted researches, that feeding of the layer of glycinats microelements in composition of the mixed fodder stimulated the processes of formation blood, namely promoted the concentration of hemoglobin in blood on 10-22%, amount of red corpuscles – on 6-23,8% and leucocytes – in 1,6 times by comparison to control and did not influence on metabolic status of bird.

It is set that glycinats microelements have high biological availability in fabrics of organism, intoxicates, that enables to offer these connections for feeding to the layer in composition of the mixed fodder during all productive period.

REFERENCES

Новая Європа: труднощі у птицеводов, конкуруючих на глобальній сцені / Ефективне птахівництво та тваринництво, 2004. - №4 (16). – С. 5-8.

ХЬЮЗ М., 1983. Неорганическая химия биологических процессов: Пер. с англ. – М.: Мир, 1983. – 416 с.

ЧУМАЧЕНКО В.Е., ВЫСОЦКИЙ А.М., СЕРДЮК Н.А., ЧУМАЧЕНКО В.В., 1990. Определение естественной резистентности и обмена веществ у сельскохозяйственных животных – К.: Урожай, 1990. – 136 с.

КАМЫШНИКОВ В.С., 2000. Справочник по клинико-биохимической лабораторной диагностике: в 2 т. – Минск: Беларусь, 2000. – 463 с.

GORNELLY S., 1949. Determination of serum protein by mean of the biuret reaction // J. Biol. Chem. – 1949. – Vol. 177. – № 2. – P. 751–755.

КОКУНИН В.А., 1975. Статистическая обработка при малом числе опытов // Український біохімічний журнал. – 1975. – №. 47, вип. 6. – С.776–790.

Acknowledgments:

This article was Ukrainian project № 0101U003212

Contact address:

Alla Sikach, Myronivsky hliboproduct, Ukraine, Kiev, Email: a.sikach@mhp.com.ua.

Nikolay Zakharenko, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: sanitary_chair@twin.nauu.kiev.ua.

Lyudmyla Malyuga, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: malugandi@bigmir.net.

Vita Mykhalska, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: vitam@bigmir.net.

Larisa Shevchenko, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: sanitary_chair@twin.nauu.kiev.ua.

Vasyl Polyakovskiy, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: pvam@ukr.net.

Inna Kurbatova, National University Of Life and Environmental Sciences of Ukraine, Kiev. Email: innakurbatova@ukr.net