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THE METABOLITES OF STREPTOMICETES AS IMMUNOSTIMULATOR IN CHICKENS RISING

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Abstract
An important part of chickens rising is feeding. A good nutrition is reflected in the bird's performance and its products. Actually the use of additives feed as immunostimulatory is in a great scale. For these reasons our investigations were aimed at studying the influence of metabolites of streptomycetes strains on the main indices of chicken's productivity. Actinomycetes are a group of prokaryotic microorganisms with many important producers of biologically active substances known to wide application in human and veterinary medicine.
In our experiments was used the dry biomass and exometabolites of streptomycetes which were administered to 3 groups of chickens since one day age respectively in combefeed a dry biomass - 1g/1kg and cultural liquid - 1ml/1 l in drinking water, daily. The duration of examination period was 70 days.
From each group of chickens periodically were sampled blood to investigate the total serum protein, albumins and cholesterol. As a results was established that the total protein in blood serum of experimental groups chickens I and II which was feed with streptomycetes biomass and cultural liquid in drinking water, at the age of 15 days was 31,23 and 30,53 g /l compared with 28,83 g /l on chickens from the control group, respectively albumins was 13,67 g/l compared with 12,33 g / l in the control chickens group, and cholesterol was 4,63 and 4,3 g/l on chickens in groups I and II compared with 4,5 g/l on chickens from the control group. The obtaining results show that the metabolites of streptomycetes has the stimulatory effect to some blood biochemical indexes of chickens.
Key words*: albumins; blood; chicken; cholesterol; metabolites of streptomycetes*.

INTRODUCTION

Population explosion, substantial enrichment to the knowledge regarding rational human nutrition, and other socio-economic considerations have led to increase growth of broilers and developing technologies that lead to externalization production capacity. Recent studies have revealed the role and current priorities in poultry: use of natural stimulators of livestock and poultry feed denied antibiotics for producing clean and safe.

Studied metabolites for use in food rations obtained from streptomycetes isolated from soil of Moldova are increasing enables productive indices in chickens. Priority remains aforementioned biomass, which contains a variety of biologically active complexes and the prime cost of the product is much smaller than the cost of other similar products. Impact assessment biopreparation "BM-36" and "LN-36" in pup weight gain demonstrated that nutritional effect of "BM-36" (increase by 116.8% and 107.0% compare with control group, respectively). Preparations based on streptomycetes biomass and exometabolites had a beneficial effect on hematopoiesis and immune system of broilers (Toderas, 2000; Burtseva, 2002). Blood and biochemical analyzes are essential to monitor the health status of flocks, although rarely can outline an etiologic diagnosis. For many species of mammals and birds, clinical and laboratory diagnosis is based largely on the results of hematological and biochemical investigations.

Regardless of advanced progress in methodology, science and laboratory technique used (Azarnova et al., 2010), hematological examination maintains its position in the wide range of investigations both in sickness and in determining the effects of medicinal remedies predetermined stimulatory properties and, not least, products bio stimulators properties and hematological results obtained in most cases serve as a reflection of the health of the animal

organism (Burtsva, 2002; Karput et al., 2009; Falca et al., 2009; Toderas, 2000).

Investigating the hematological animals and birds, regardless of scientific and practical progress remains current. Therefore, we considered it important to study influence biomass and exometabolites of Streptomyces strains isolated from soils of Moldova on hematology parameters in chickens.

MATERIALS AND METHODS

Was used for investigations biomass and exometabolites liquid cultural of streptomycetes administrated to chichickens daily in a dose of 1g per 1kg concentrated fodder and 1ml per 1l respectively drinking water. The research was conducted at the Department Epizootology, State Agrarian University of Moldova.

The biomass and exometabolites of streptomycetes were obteined behind the initiation of experiments conducted at the Institute of Microbiology and Biotechnology of the Academy of Science of Moldova. Cultivation of streptomycetes was carry out on complex liquid medium R, the source of Carbon and Nitrogen was corn flour.

Investigations were conducted on 3 groups of 25 chickens each breed Rhode Island one day old, kept in conditions analogue. I group served as the control group. The chickens of group II received 0.1% biomass ratio of streptomycetes daily, chickens of group III in drinking water was administered 1 ml/l liquid culture of streptomycetes. Were studied some biochemical indices and CBC.

The chicks were fed with fodder of appropriate biological value age. As to using EDTA anticoagulant, knowing that heparin is not indicated for the determination of fibrinogen and may fail to count white blood cells (Clark et al., 2009). Blood count parameters were assessed using comparative methods enshrined in avian hematology.

The data were processed graphically and statistically analyzed by resorting to specialized applications (**MATLAB).**

When evaluating the data recorded in the experimental groups, we used as reference values obtained in the initial investigations performed on controls, together with those from the literature.

RESULTS AND DISCUSSIONS

Hematological values in chickens research subject 1 day living are presented in table 1.

Table 1. Hematological values in chickens aged a day

Parameter	Total protein g/l		Albumin g/l		Leukocytes 10^9/l		non-segmented neutrophils %		Segmented neutrophils %		Eosinophils %		Lymphocytes %		Monocytes %		Total cholesterol mmol/l		Triglyceride mmol/l	
	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p	$\bar{X}$	p
Values obtained	28.96	0.14	13.06	0.14	54.83	0.27	1.33	0.01	1.33	0.01**	1	0.01*	81.67	0.4	4.66	0.02	4.53	0.02	0.53	0.01*

*< **>

On the first day of life, total protein averaged 28.96 ± 0.14 g / l, which subsequently increased with age in all groups. About similar mean values of serum total protein both at the beginning and at the end of the study reports and other authors (Islam et al., 2009; Matveeva et al., 2009, Shmakov et al., 2011).

Analysis of the results presented in Table 1. talk about values within physiological, hematological indices of the first day of life which obviously reflects good health of the offspring at study onset. Similar results of hematological in chickens during the first days after hatching and other authors reported (Karput et al., 2009).

At 15, 55 and 70- day life blood samples were collected for laboratory tests in Tables 2, 3 and 4.

Table 2. Hematological values in chickens aged 15 days

Parameter	Total protein g/l		Albumin g/l		Leukocytes 10^9/l		non-segmented neutrophils %		Segmented neutrophils %		Eosinophils %		lymphocytes %		Monocytes %		Total Cholesterol. mmol/l		Triglyceride mmol/l	
	X '	p	X '	p	X '	p	X '	p	X '	p	X '	p	X '	p	X '	p	X '	p	X '	p
Lot I	28.83	1.44	12.33	0.62	63.53	0.04	1.33	0.07	11.33	0.57	1.53	0.07	80	4	4.33	0.22	4.50	0.23	0.66	0.03
Lot II	31.23	1.56	13.67	0.68	67.46	0.04**	0.67	0.03	4.28	0.55	0.33	0.02	83.33	4.17	10.33	0.52	4.63	0.23	0.67	0.03
Lot III	30.53	1.53	13.37	0.67	65.76	0.3	1	0.05	10.66	0.53	1.33	0.03	80.67	4.03	10	0.5	4.30	0.22	0.57	0.03

Table 3. Hematological indices in chickens aged 55 days

Parameter	Total protein g/l		Albumin g/l		Leukocytes 10^9/l		non-segmented neutrophils %		Segmented neutrophils %		Eosinophils %		lymphocytes %		Monocytes %		Total Cholesterol. mmol/l		Triglyceride mmol/l	
	X '	p	X '	p	X '	p	X '	p	X '	p		X '	p	X '	p	X '	p	X '	p	X '
Lot I	30.83	0.15	12.67	0.06	771.13	0.36	3.67	0.02	12.33	0.06	Lot I	30.83	0.15	12.67	0.06	771.13	0.36	3.67	0.02	12.33
Lot II	31,23	0,16	16,50	0,08	83.77	0.42	3.67	0.01	9	0.04	Lot II	31,23	0,16	16,50	0,08	83.77	0.42	3.67	0.01	9
Lot III	34.30	0.17	10.50	0.05	73.1	0.37	4.33	0.02**	11.67	0.05**	Lot III	34.30	0.17	10.50	0.05	73.1	0.37	4.33	0.02**	11.67

Table 4. Hematological indices in chickens aged 70 days

Parameter	Total protein g/l		Albumin g/l		Leukocytes 10^9/l		non-segmented neutrophils %		Segmented neutrophils %		Eosinophils %		Lymphocytes %		Monocytes %		Total Cholesterol. mmol/l		Triglyceride mmol/l	
	X '	p	X '	p	X '	p	X '	p	X '	p		X '	p	X '	p	X '	p	X '	p	X '
Lot I	23.43	0.12	10.27	0.05	771.13	0.36	3.67	0.02	12.33	0.06	Lot I	23.43	0.12	10.27	0.05	771.13	0.36	3.67	0.02	12.33
Lot II	26.03	0.13	10.56	0.05	83.77	0.42	3.67	0.01	9	0.04	Lot II	26,03	0,13	10,56	0,05	83.77	0.42	3.67	0.01	9
Lot III	31.07	0.16	13.27	0.07	73.1	0.37	4.33	0.02**	11.67	0.05**	Lot III	31.07	0.16	13.27	0.07	73.1	0.37	4.33	0.02**	11.67

* ^ ** v

From the data presented it can be mentioned that the total protein in the experimental groups increased by 6.29% in chickens in group II and 16.58% in offspring of group III compared with controls. At the same time, and albumin levels increased in group II Chicken with 14.63% and 6.84% in group III in dynamic chickens at the age of 55 days was a decrease of 17.12% albumin levels in serum from chickens in group III compared to the control group chickens. Recorded data shows that preparation protein-synthetic show positive influence on the function of the liver and especially on protein metabolism. The importance of assessing the cholesterol level can be considered as a sample function of the liver, metabolic processes involved in cholesterol to form bile acids, cholesterol esters. Involved in the transport of cholesterol esters of polyunsaturated fatty acids, important sources for the synthesis of biologically active substances (prostaglandins, thromboxane and leukotriene). In this consensus, the offspring of experimental groups aged 15 days was an

increase of 2.2% in chickens in group II, and a decrease of 5.07% in chickens in group II and 0.67% in offspring in group I. At the age of 70 days chickens, cholesterol is decreasing constituting 14.25% in group II chickens, chickens 13.96% in group II and 40% in chickens in group I. Analysis of triglycerides in virtue chickens for 70 days was 56.3% in group II chickens, chicks 41.5 in group II compared with the value of 26.4% in the control group chickens.

The researches have shown that experimental chicken in batches, the number of lymphocytes and monocytes had a similar evolution significant increase in the mean values of these parameters compared with the control group indices. In the offspring of experimental groups leukocytes values were down compared to the control group, but statistical difference between them is significant. Leukocytes study results shown in table 2 batches of lymphocytes in chickens confirms that the values in groups II and III values were 4.16% and 0.83%, higher than the control group offspring clues 0.41 -1.25% (table 4).

Distribution of no segmented neutrophils core have been reported following values compared with controls: table 2 from 80.23 to 40.11%; and table 4- 21.18%. Significant differences between the values of neutrophils in chickens in the experimental and control groups of those not registered. We emphasize higher value of the number of monocytes in the offspring of experimental groups was 51.89 ± 0.72% on average compared to 42.92 ± 1.85% in chickens from the control group (table 3). The interpretation of these results in relation to recent scientific data is therefore detrimental tested product indicating that the decrease in peripheral blood monocytes may be a consequence of their migration into tissues, transformation and their maturation in macrophages (Karput et al., 2009).

CONCLUSIONS

The metabolites produced by streptomycetes isolated from Moldavian soils helps stimulate nonspecific resistance.

Use in poultry of metabolites produced by streptomycetes isolated from Moldavian soils, helps optimize fat metabolism during periods of intensive development, showing a byproducts adaptive.

The metabolites produced by streptomycetes isolated from soils of Moldova favors protein synthesis in the liver of chickens, because their content in amino acids and biologically active substances.

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