IJPSR (2020), Volume 11, Issue 1 (Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 30 March 2019; received in revised form, 27 August 2019; accepted, 02 September 2019; published 01 January 2020

EFFECTIVENESS OF PROBIOTICS USE IN POULTRY FARMING

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Keywords:

Poultry farming.
Dysbacteriosis, Probiotics

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ABSTRACT: A bird is often subjected to dysbacteriosis with a low quality of feed. As a result, live weight gain and livability are reduced in broilers. This problem has become particularly acute now when most countries have abandoned the use of feed antibiotics. Significant assistance in this situation is provided by new regulators of intestinal biosynthesis - probiotics. In our research, we used biosporin produced by the Military and Technical Problems Centre of the Research Institute of Microbiology of the Russian Ministry of Defense. Scientific and household experience was conducted on the basis of ZAO "Ural broiler". Three groups were formed: one control group and two experimental ones. There were 100 units in each group. The results of scientific and household experience lead to the conclusion that biostim is more preferable with the comparative use of two liquid probiotic products from the point of view of production figures. Feeding it to a bird in accordance with the instruction allows increasing the live weight of broiler chickens by 11.5%, reducing the cost of feed per unit of production by 8.7% and increasing the payment of feed by 9.1-10.1%.

INTRODUCTION: Poultry farming is one of the promising areas in the agricultural sector. According to experts, competitiveness and profitability of the industry under market conditions can be enhanced by using natural growth stimulants to produce products that are environmentally safe for humans [1, 2]. It is known that most of the microorganisms that inhabit the intestine are safe and do not cause diseases, but there is a constant competition between bacteria of different species for space and nutrients [3, 4].

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.11(1).179-82

The article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.11(1).179-82

Harmless and conditionally pathogenic bacteria inhibit the growth and reproduction of each other [5, 6]. However, temperature stress, changing diet, regrouping and vaccination inevitably affect the microbiological balance in the gastrointestinal tract and shift it towards pathogenic or conditionally pathogenic microflora [7]. With such disorders, intestinal balance can be restored with the help of favorable bacteria, additionally injected with food. The principle of replacing unfavourable bacteria by competing with them useful ones is known as the principle of probiotics [8, 9]. The purpose of the work is a comparative assessment of the use of the center of probiotic Biosparin and probiotic biostim in the diets of broiler chickens.

MATERIALS AND METHODS: In our research, we used biosporin produced by the Military and Technical Problems Centre of the Research

Institute of Microbiology of the Russian Ministry of Defense. It is a liquid microbial mass of live strains - *B. subtilis* and biostim, which contains the microbial mass of alive cultures of lactic acid bacteria and natural microorganisms of the genus *Bacillus*, which are included in the national register of the Russian Federation.

Scientific and the household experience was conducted on the basis of ZAO "Ural broiler". Three groups were formed: one control group and two experimental ones. There were 100 units in each group. The same housing conditions were created in accordance with zoo hygienic requirements for the chickens of the control and experimental groups. There was complete feed, the average daily consumption of which is given in **Table 1** (averagely per head per day).

Chickens of the first control group received the basic ration, broilers of the second experimental group received in the first 28 days - 2.5 ml of biosparin center; at the age of 29 - 42 days. Respectively, 5 ml in addition to the basic ration. Chickens of the third group up to 10 days of age received 0.005 ml of biostim; at the age of 11 - 20 days - 0.01 ml; chickens older than 20 days of age received biostim in the amount of 0.015 ml per head.

During the experiment, the following indicators were taken into account: the live weight of chickens (weekly weighing), livability and causes of death, feed consumption.

TABLE 1: CONSUMPTION OF FEED AND NUTRIENTS BY BROILER CHICKENS FOR THE PERIOD OF THE EXPERIMENT (ON AVERAGE PER HEAD PER DAY)

Indicator	Growing period	
	Starting (1-28 days)	Final (28-42 days)
Combined feed PK-5	57.7	
Combined feed PK-6		146.1
Feed mixture contains:		
Metabolic energy, kcal	181.2	470.4
Crude protein, g	13.1	30.9
Crude fiber, g	1.8	4.3
Crude fat, g	2.1	9.1
Lysine, mg	831	1870
Methionine + cystine, mg	611.6	1417.2
Tryptophane, g	202.0	482.1
Calcium, mg	859.7	1899.3
Phosphorus, mg	507.8	1125.0
Erythropoietin, EPO	138.3	152.2

Results of Researches: The results of the experiment are presented in **Table 2**. From the table above, it is clear that with the inclusion of probiotics, the livability of the chickens was higher in the experimental groups by 2 points compared with the control one over the period of the experiment. Growing broilers only on complete feed (1st experimental group) allowed us to obtain an average daily gain in live weight of 46.06 g, with the addition of probiotic biosparin (2nd experimental group) by 7.0%, and with the addition of biostim (3D experimental group) – by 11.5% more in comparison with the first group.

TABLE 2: GROWTH INTENSITY AND LIVABILITY OF BROILER CHICKENS

Indicator	Group		
	1 Control	2 Experimental	3 Experimental
Live weight (g), at the age of (days):1	46.00 ± 0.39	45.70 ± 0.33	45.90 ± 0.55
7% to control	97.70 ± 0.79	98.00 ± 0.73	98.50 ± 0.76
	100	100.3	100.8
14% to control	422.00 ± 15.33	410.00 ± 9.07	420.60 ± 4.42
	100	97.2	99.7
21% to control	754.00 ± 36.76*	782.00 ± 28.97	736.00 ± 5.02
	100	103.7	97.6
28% to control	1183.00 ± 51.55	1210.00 ± 32.14	1168.00 ± 7.49
	100	102.3	98.7
35% to control	1670.00 ± 73.11	1720.00 ± 44.22	1700.00±7.38
	100	103	102
42% to control	2032.00 ± 72.43	2165.00 ± 39.47	2230.00 ± 42.29*
	100	103	109.7
Absolute increase, g	1986.00 ± 72.34	2119.30 ± 39.72	2184.10 ± 42.24*
% to control	100	106.7	110
Average daily gain, g	46.06 ± 1.77	49.31 ± 0.95	51.37 ± 1.23*
% to control	100	107	111.5
Livestock livability, %	93	95	95

Hence forward *P<0, 05; ** P<0, 01;*** P<0,001

We conducted a physiological experiment, aim of which was determination of the actual digestibility of protein from the feed mixture by broiler chickens, who received probiotics as feed additives. During the period of the physiological experiment, the chickens perceived 146.1 g of feed mixture, with its full eat ability. The actual feed intake and excretion of nutrients with feces made it possible to calculate the protein digestibility coefficients shown in **Table 3**.

TABLE 3: RAW PROTEIN DIGESTIBILITY COEFFICIENT

Indicator	Group		
	1 Control	2 Experimental	3 Experimental
Content of crude protein in feed	30.9	30.9	30.9
Loss of crude protein with excrement	1.39 ± 0.14	1.23 ± 0.18	1.15 ± 0.07
Raw protein digestibility coefficient	95.5 ± 0.43	96.0 ± 0.58	96.27 ± 0.23

With the same protein intake with feed, its losses with undigested fecal masses decreased by 1.39 g in the control group, by 1.23 g in the 2D group and by 1.15 g in the 3d experimental group. The coefficient of digestibility of raw protein in feed in the experimental groups tended to increase by 0.5 points in the 2 experimental groups and by 0.8 points in the 3 experimental groups. Control killing of chickens at the age of 42 days was carried out to determine the meat qualities. Slaughter yield and morphological composition of the carcasses are presented in **Table 4**.

TABLE 4: RESULTS OF CONTROL SLAUGHTER OF BIRDS

Indicator	Group		
	1 Control	2 Experimental	3 Experimental
Weight, G:			
Pre slaughter	1983.3 ± 14.24	2100.0 ± 28.87*	2233.3 ± 3.33***
Semi eviscerated carcass	1580.3 ± 16.33	1719.5 ± 4.74**	1824.7 ± 11.35***
Eviscerated carcass	1320.0 ± 5.00	1452.0 ± 2.00***	1546.7 ± 20.28***
Muscles	797.7 ± 5.0	923.0 ± 7.00***	976.7 ± 14.53***
Internal fat	30.7 ± 0.67	31.7 ± 0.33	51.7 ± 4.37*
Skin with subcutaneous fat	188.3 ± 4.41	198.3 ± 4.41	214.0 ± 3.05*
bones	303.3 ± 3.33	299.0 ± 2.64	304.3 ± 0.67
Slaughter yield of eviscerated carcass, %	66.6 ± 0.23	69.2 ± 0.95	69.3 ± 0.82*

Hence forward *P<0, 05; ** P<0, 01;*** P<0,001

Pre slaughter lives weight of the birds in groups corresponded to the results of the experiment on the study of growth. The weight of the semi eviscerated carcass of chickens from the experimental groups exceeded the latter by 139.2 g in the second group, by 244.4 g in the 3 experimental group (P<0.01; P<0.001), and the weight of the eviscerated carcass exceeded by 132 and 226.7 g respectively (P<0.001). Slaughter yield of the eviscerated carcass in the 2 experimental groups was higher by 2.6 points, in the 3 experimental groups it was higher by 2.7 points compared with indicator 1 of the control group.

The feed supplement of the probiotic biosporin centrate to the diet of broiler chickens increased the amount of muscle tissue in eviscerated carcass by 15.7%, internal fat by 3.3%, skin with subcutaneous fat by 5.3% and led to a decrease in bones by 1.4%. The use of biostim led to an increase in absolute terms of these figures by 22.5%, 68.4 and 13.6% respectively with the same amount of bone tissue in the carcass.

CONCLUSION: Thus, the obtained results allow us to conclude that biostim is more preferable with the comparative use of two liquid probiotic products from the point of view of production figures.

Feeding it to a bird in accordance with the instruction allows increasing the live weight of broiler chickens by 11.5%, reducing feed costs per production unit by 8.7% and increase the payment of feed by 9.1-10.1%.

ACKNOWLEDGEMENT: This research was funded by the Ministry of Education and Science of the Russian Federation Research Grant, 2017.

CONFLICTS OF INTEREST: The authors declare there are no conflicts of interest regarding this study.

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How to cite this article:
Smolentsev SY, Matrosova LE, Chekhodaridi FN, Gadzaonov RK, Kozyrev SG, Gugkaeva MS and Kornaeva AK: Effectiveness of probiotics use in poultry farming. Int J Pharm Sci & Res 2020; 11(1): 179-82. doi: 10.13040/IJPSR.0975-8232.11(1).179-82.