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Comparison of the Multibehsil and common commercial probiotic supplements in the marke in the diet of laying hen and broiler chicken

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Abstract

This project was carried out in three sub-projects with the aim of comparing the effects of internal probiotic (Multi Behsil) with external probiotic (Protexin) on the production performance of broilers, pullet and laying hens . In the first project, comparison of the effects of Multi Behsil (MBE) probiotics with Protexin (PRO) on growth, morphology, and pH of the small intestine and cecal contents and evaluation of the immune system of Nick chick pullet were performed in two stages. The first phase was from 8-13 weeks of age with a completely randomized design consisting of 3 treatment groups with 4 replications and 40 birds per each replicate. Three treatments included: 1- Normal drinking water without adding internal or external probiotics (control treatment; CT). 2- Adding 300 g of PRO in 1000 liters of drinking water and two meals daily, 3-Adding 200gr of MBE in 1000 liters of drinking water and two meals daily. After the transfer of pullets, the second phase of the experiment lasted from 14 to 18 weeks of age. In the second phase, 144 birds were used in a completely randomized design consisting of 3 treatment groups with 4 replications and 12 birds per each replicate. Three treatments included: 1- basal diet (CT), 2- basal diet + 100 gr/ton of PRO probiotics, 3- basal diets + 200 gr/ton of MBE probiotics. In the first phase of experiment the results showed that using 300 g/lit of PRO probiotic compared to the CT group significantly increased the length and width of the lice, the crypt depth and the absorption rate of the lice and reduced pH of the duodenum and jejunum contents, total cholesterol, triglyceride and LDL in the blood serum of Pullets ($P<0.05$). In the second phase, the use of PRO probiotic supplementation increased end-period weight and the average weight gain of the pullets compared to the CT group and the group receiving MBE probiotic. Adding 200 g/ton of feed from MBE probiotic increased the length, width and absorbency of villi and decreased pH of duodenum, jejunum and ileum contents compared to the CT group, respectively($P<0.05$). The levels of total cholesterol, triglyceride and LDL in the blood serum in pullets fed diets containing probiotic supplementation decreased compared to the CT diet. Based on the results of this study, it can be concluded that the use of PRO and MBE probiotic supplements in the feeding of pullets in comparison with the control group due to positive effects on intestinal histology indexes, intestinal pH, blood serum fats and end-of-period weight are recommended.

In the second project, comparison of the effects of MBE probiotics with PRO on performance, egg quality and blood parameters of laying hens (from 26 to 46 weeks of age) were performed. For this purpose, 180 pieces of Nick Chick hens were distributed in a completely randomized design with 3 treatments, 4 replications and 12 laying hens in each replicate. The chickens were divided into 3 experimental treatments based on the same average weight. Experimental treatments included basal diet (CT), basal diet supplemented with 200 g/ton MBE probiotic, basal diet supplemented with 100 g/ton PRO probiotic.The results showed that compared to the CT, diets containing MBE and PRO improved the feed conversion ratio (2.03 and 2.28 vs. 2.14), egg production (87.1 and 84.5 vs. 83.3 percent) and egg mass (50.22 and 48.91 vs. 47.67 gr), respectively ($P<0.05$). Using probiotic supplementation (MBE and PRO) in the diet significantly increased (specific gravity, shell thickness, yolk color index and shell strength) and significantly reduced egg yolk cholesterol at 34 weeks of age ($P<0.05$). Serum levels of cholesterol and triglyceride in laying hens fed diets containing probiotic supplements (MBE and PRO) tended to decrease compared with the CT. Overall, the use of MBE supplementation in the laying hen diet was comparable to that of probiotics supplemented with PRO and provided better performance in most of the traits studied than the CT.
In the third project, comparison of the effects of MBE probiotics with PRO on performance, carcass characteristics, blood metabolits, immune system, morphology of the jejunum, pH contents of the small intestine and cecum of broilers (from 1to 42 days of age) were performed. Seven hundred and twenty Ross broilers were randomly distributed to 24 experimental units and 6 dietary treatments (4 replicates with 30 birds in each).The completely randomized design with factorial arrangement 2×3 with two forms of feed (mash and pellet) and three modes of using probiotic supplement (without probiotic supplement, probiotics supplementation with PRO and MBE) were used. The results showed that pelleting diets resulted in greater feed intake, weight gain and improved feed conversion ratio during starter, grower, finisher and overall period ($P<0.01$).The use of PRO compared to CT diet resulted in a significant increase in weight gain and improved feed conversion ($P<0.05$).The use of probiotic supplementation in the diet caused a significant increase in the dressing and breast percentage ($P<0.05$). The use of pellet diet compared to the mash form resulted in a significant increase in the cholesterol and triglyceride levels and jejunum villi surface of the small intestine in the broiler chicks at the end of the period ($P <0.05$).The use of probiotic supplementation significantly increased the villus height and crypt depth ($P <0.05$).The use of PRO and MBE supplements in the diet resulted in a significant decrease in the pH of duodenum, jejunum and ileum ($P <0.05$). The serum total antibody titers and IgM in broiler fed with probiotic supplementation of PRO and MBE were higher than the CT group. Based on the results of this study, it can be concluded that the use of probiotic supplements in pellet diets has led to improved breeding performance of broiler chickens compared to mash form diet. In this regard, PRO compared to the MBE probiotic supplement showed higher efficacy.

Keywords: Probiotic, Multi Behsil, Performance, Pullet, Laying chicken, broiler