

Effect of probiotic(Bifidobacterium and Streptococc) on performance and serum parameters of broiler chickens

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ABSTRACT: A study was conducted to determine the effect of probiotic on the performance and serum parameters of broilers chickens. In completely randomized design with 4 treatments (0 , 0.5, 1, and 1.5 dose of probiotic levels)¹ and 5 replicates of 12 birds each 240 day-old mail Hubbard Classic broiler chickens with the average weight of 42±2 gram, chickens were placed in 1 × 1.2 m pens for 42 days. Feed and body weight gain recorded weekly. 4 °C of blood samples was collected from slaughtered birds of 21 and 42 days of age, and transferred to vials for some serum parameter determination .Feed intake and serum Triglycerides were not affected by treatment at 42 days of age. Body weight and feed to gain ration at 0-21 days of age were significantly (p<0.05) improved by treatments. Serum cholesterol and HDL at 42 days of age were affected by treatments (p<0.05). Under the condition of this experiment probiotic levels added to the drinking water improves body weight and feed efficiency at 21 days of age , decreases serum cholesterol and increases serum HDL at 42 days of age.

Key words: Broiler, Performance, Probiotic, Serum parameters
Quantity of doses: 40000 doses /gram

INTRODUCTION

There is a worldwide attempt to reduce antibiotic use in animal production because increased microbial resistance to antibiotic and residues in animal products can be harmful to consumers (Yeo et al,1997). Probiotics are one of the feed additive; which are the live culture of useful micro-organisms like *Lactobacillus acidophilus*, *Bifidobacterium thermophilum* and *Bacillus subtilis* (Rahman et al, 2007). It is well recognized by this time that the probiotics are live micro organisms and when administered through the digestive tract, cause a positive impact on the host's health (Pish Jang, 2011). Healthy animals generally maintain a balanced microbial population that plays an important role in the growth and health of animals (Ahmad ,2006). Some studies show that probiotics supplementation in feed of chickens improves the performance and it has been reported probiotics were the most effective growth promoter (Hosseini Mansoub, 2011). For example intestinal bacteria metabolize nutrients in the contents and produce short chain fatty acids and lactic acid, and synthesize some vitamins. Some of these activities can be beneficial to host animals (Ahmad, 2006). According to concerns about cholesterol ,there are a lot of attempts to produce foods with low cholesterol .It has been reported that *Lactobacillus acidophilus* can absorb cholesterol from in vitro system and this phenomenon can decrease the cholesterol level of medium(Mohan,et al ,1996). Probiotic supplementation has been shown to reduce the cholesterol concentration in egg yolk (Yeo et al.1997; jin et al ,1998; Pish Jang 2011; Mohan et al ,1996). The objective of the present study was to determine the effect of the probiotic on performance and serum parameters of broiler chickens.

MATERIAL AND METHODS

A total of 240 one day-old mail Hubbard Classic broiler chicken were randomly into 5 replicates of 12 birds with a same weight average about (42±2 g) have been experimented, each of four level of probiotic (0

,0.5 , 1 and 1.5 dose) added to drinking water were given to the chicken four 42 days. A basal diet was formulated and considered according to recommendation of NRC, 1994. We have weight them for each week .At the age of 21 and 42 days one chicken each pen has been selected randomly for bleeding and slaughtered. 4^{cc} of blood get from the jugular vein and was transferred to the laboratory for determined serum parameters (Jin et al,1998). Data were analyzed using the General Linear models procedures of SAS 2001.

RESULTS AND DISCUSSION

The results of feed additive on broiler performance are presented in table2. During growing and finishing periods, feed intake was not affected dy treatment .How ever feed conversion ratio (FCR) was significantly improve (p<0.05) in chicken which had received probiotic supplement diet from third weeks of age. Average weight gain was increased (p<0.05) by feeding the diet containing 1.5 dose of probiotic during the first 3-wk period. During 21-42 day of age daily weight gain and feed conversion ratio were not significantly (p<0.05) different among the diet groups. These results are agreement with the finding Yeo and Kim (1997) ,who reported that average daily weight gain of chickens fed probiotic was significantly increased during the first 3-wk of growth but not during the 4th to 6th wk of growth. Feed conversion ratio (FCR) was significantly lower (p<0.05) in chicks which had received probiotic supplemented diets from first 3-wk period as compared to the control. These results are agreement with the finding of Yeo and Kim (1997) who reported that the use of probiotic in broiler chick diet significantly improved feed efficiency.

Table1. Basal composition and analyzed results of the experimental diets

Ingredient	0 to 21 d	21 to 42 d
Corn (%)	59.5	49.22
Wheat (%)	----	16.22
Soybean mail (%)	30.59	28.75
Fish meal (%)	4.58	----
Oil (%)	2.5	2.5
Lime stone (%)	1.01	1.08
Dicalcium phosphate (%)	0.87	1.08
Salt (%)	0.27	0.3
Vitamin mix (%)	0.25	0.25
Mineral mix (%)	0.25	0.25
DL-methionine (%)	0.18	0.07
Calculated value		
ME , Kcal/Kg	3000	3000
Crude protein, %	21.56	18.75

Table2. The main effect of treatment on growth performance broiler chickens

Variable	control	Control+0.5dose	Control+1dose	Control+1.5dose	±SE
0-3 week					
FI ,g	1007.26	972.71	984.63	982.48	18.52
BWG ,g	553.96 ^a	567.64 ^a	579.8 ^a	598.82 ^b	12.73
FCR	1.8 ^a	1.71 ^b	1.69 ^b	1.64 ^b	0.03
3-6week					
FI ,g	3171.4	3243.4	3210	3168.6	96.64
BWG ,g	1295.4	1295.67	1323.84	1328.5	59.8
FCR	2.54	2.55	2.42	2.38	0.14
0-6week					
FI ,g	5235.02	5220	5229.8	5209.4	97.83
BWG ,g	2417.36	2444.02	2446.06	2447.34	60.20
FCR	2.16	2.13	2.13	2.12	0.03

Means with in Rows no common superscript differ significantly (p<0.05).
FI=Feed intake BWG=body weight gain FCR=feed conversion ratio

Table3. The main effect of treatment on serum lipid concentration as (mg/dl) of broiler chicken

variable	Control	Control+0.5dose	Control+1dose	Control+1.5dose	±SE
3 week					
Cholesterol	130.02	119.7	116.84	115.84	8.24
HDL	80.16	96.86	88.86	80.3	8.01
Triglyceride	155.54	138.78	102.56	181.52	57.47
6 week					
Cholesterol	145.22 ^a	139.48 ^a	136.92 ^a	116.34 ^b	5.99
HDL	86.1 ^a	113.48 ^b	112.92 ^b	105.42 ^b	4.71
Triglyceride	109.82	142	164.64	155.56	18.53

Means with in Rows no common superscript differ significantly (p<0.05).

The effect of feed additive on blood constituents presented in table 3. At 21 days of age ,no significant difference were observed in triglyceride ,HDL and cholesterol levels between treatments. In 42 day old bird,

dietary supplementation with probiotic increase HDL concentration ($p < 0.05$). These results are in agreement with the finding Ashayerzadeh et al,(2011),also at 42 days of age cholesterol levels decrease ($p < 0.05$) in chicken which had received diet containing 1.5 dose of probiotic. Hosseini Mansob, (2011) ; Ashayerzadeh et al,(2011) Pish Jang, (2011) and Jin et al,(1998) reports the cholesterol level of serum significantly decreased in groups supplemented with probiotics in compared to control group .There are many reports that are in agreement with presented results in the current study .*L.acidophilus* is capable to deconjugate glycocholic and taurocholic acid under anaerobic condition .Deconjugation of gallbladder acids in small intestine can affects control of serum cholesterol, while deconjugated acids are not capable to solve and absorb fatty acids as conjugated acids. As consequence, they prevent from absorption of cholesterol.

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