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Application of Lactobacillus Acidophilus Probiotic in Healthy Chickens

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Abstract: The effect of the probiotic, lactobacillus acidophilus on the chicken performance response variables (body weight, growth rate and feed conversion) was studied. The present studies was carried out on one hundred chickens, one day old, apparently clinically healthy. Chickens were divided into two equal groups. The first group was used as control, fed a ration free of drugs and not treated with the probiotic. The second group was fed a ration containing the lactobacillus acidophilus from the 1st day until the end of experiment (forty two days). During the experimental period, chickens of each group were weighed and the ration weight was calculated at the 1st day, 1st week, 2nd week, 3rd week, 4th week, 5th week and 6th week of the experiment, for determination of the range of difference of weight, growth and the feed conversion rate in presence and absence of the probiotic. It could be concluded that, the chickens on the probiotics were shown a significant increase of their body weight, growth rate and the feed conversion rate in comparison to the control group. This results might help in increase of income and economic growth by using natural source of probiotics which are not harmful to the consumers and their health might improved.

Key words: Probiotic · Lactobacillus · Acidophilus · Health Chicken

INTRODUCTION

Lactobacillus acidophilus gets its name from lacto- meaning milk- bacillus meaning rod-like in shape and acidophilus meaning acid-loving. This bacterium thrives in more acidic environments than most related micro-organisms (pH 4-5 or lower) and grows best at 45°C. It occurs naturally in the human and animals gastro-intestinal tract, mouth and vagina [1]. It ferments lactose into lactic acid, like many lactic acid bacteria.

Some strains of *L. acidophilus* may be considered a probiotic or "friendly" bacteria [2]. These types of healthy bacteria inhabit the intestines and vagina and protect against some unhealthy microorganisms. The beak down of nutrients by *L. acidophilus* produces lactic acid, hydrogen peroxide and pther by protects that make the environment hosyile for undesired organisms. *L. acidophilus* also tends to consume the nutrients of many other organisms depend on, thus outcompeting possible harmful bacteria in the digestive tract. During digesion, *L. acidophilus* also, assists in the production of niacin and folic acid and pyridoxine. It can assist in bile seconjugation separating amino acid from bile acids, which can be recycled by the body [3].

Some researchers have indicated *L. acidophilus* may provide additional healthy benefits, including improved gastrointestinal function and a boosted immune system. It provide relief from indigestion and diarrhea [4].

He found that feed supplemented with it and fed to cattle resulted in 61% reduction of *E. coli*. Research has indicted that *L. acidophilus* may be helpful reducing serum cholesterol levels [5]. The acid produced by *L. acidophilus* has a beneficial effect in cases of oral or gastrointestinal candidiasis infection [6]. Since feed additive antibiotics are being used to prevent the diseases and they have certain limitation because they leave a drug residues in poultry products and encourage a drug-resistant pathogens [7]. Therefore, it must be searched about tool other than antibiotic for controlling infection and promoting growth.

The present work was planed to study, the role of lactobacillus acidophilus as a feed additive in healthy broiler chickens with studying the chicken performance response variables.

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MATERIALS AND METHODS

Lactobacillus Acidophilus (L.A.): A commercial product contains source of viable naturally occurring micro-organisms (La Pot. Biochem. Int). a concentrate of L.A. for use as a dried fed microbial in poultry feeds. It contain Lactobacillus acidophilus 0.8 billion cfu/g (8×10^8 cfu/g). The product was added in a dose 1g/kg. of feed.

Experimental Chickens: One hundred- one day- old commercial meat type chicks (Hubbered breed) were assigned into two group. Each group was consisted of 50 birds. The first group was kept as control, while the second group was fed on ration mixed with Lactobacillus acidophilus for the entire period of the experiment.

All birds were fed on a commercial balanced ration ad.lib. consumption. The chickens were vaccinated against Newcastle and infectious bursal diseases using Hitchner Bi vaccine at 5-day old, Gumboro vaccine at 13 and 23 day-old and Lasota vaccine at 18-day old. Starter ration was used for the first 4 weeks and finisher feed for the remaining of period. No antibiotics were added to the ration.

Experimental Design: Birds of group 1 and 2 were kept for 6 weeks observation period as non treated, control and treated groups weighted weekly and chicken performance response variables were determined including, bird body weight (weekly), relative growth rate [8] and [9] and feed conversion ratio (FCR) [10].

RESULTS AND DISCUSSION

Significance differences were indicated between mean body weights at 1st, 4th and 6th weeks of age and final feed conversion ratio (FCT) as well as in relative growth rate

Table 1: The chicken performance response variables of non-treated and treated broiler chickens with lactobacillus acidophilus (MEAN±SEM)

Group No	Treatment	Age days	No of birds	Average B.W (gm)	Average W (gm)
1	Control	1	50	46.44±0.81	0
		7		53.62±1.26	7.38
		14		185.11±0.99	131.49
		21		396.26±1.71	211.4
		28		711±1.73	314.73
		35		965±1.17	254.68
		42		1323±1.69	357.3
2	L.A	1	50	46.44±0.81	0
		7		75.38±1.53*	28.98*
		14		193.03±2.34	117.63
		21		368.37±1.08	175.32
		28		893.33±0.99*	514.38*
		35		1036.6±2.07	153.27
		42		1767.30±2.97*	553.95*

*P ≤ 0.05

Table 2: The chicken performance response variables of non-treated and treated broiler chickens with lactobacillus acidophilus (MEAN±SEM)

Group No	Treatment	Age Days	No of Birds	Feed Conc. (kg)	Relative Growth Rate	Feed Conc. (Total)	FCR (Final)
1	Control	1	50	0	0	255.73	1.94
		7		6.75±0.72	12.92		
		14		23.76±2.88	99.14		
		21		35.79±2.88	65.38		
		28		43.67±3.69	51.17		
		35		48.6±2.61	27.34		
		42		97.2±2.97	28.09		
2	L.A	1	50	0	0	271.04	1.70*
		7		10.13±0.99	42.85		
		14		25.32±2.07	78.90		
		21		30.38±1.98	56.22		
		28		45.56±1.71	74.05*		
		35		50.63±2.79	14.37		
		42		109.03±3.06*	27.95*		

*P ≤ 0.05

(Table 1, 2). Probiotics as lactobacillus acidophilus is a natural control method that is based on ensuring the bird has an adequate gut microflora to counteract the growth and colonization of pathogenic bacteria in its digestive tract.

They act by lowering the pH through production of lactate, lactic acid and volatile fatty acids [2].

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