

Effect of Probiotic Supplementation on Broiler Performance

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ABSTRACT

A total of 250 day old broiler chicks were used to investigate the effect of probiotics on broiler performance. They were equally but randomly divided into five groups. One group served as a control while the other four were given probiotics at different schedule. The results indicated that the weight gain, feed conversion ratio, dressing percentage and weight of giblets did not change by the treatment of probiotics. More research is needed to further verify our results.

Keywords: Probiotic; broiler; performance; immunity

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INTRODUCTION

In large-scale rearing facilities, where poultry are exposed to stressful conditions, problems related to diseases and deterioration of environmental conditions often occur and result in serious economic losses. Prevention and control of diseases have led during recent decades to substantial increase in the use of veterinary medicines. However, the utility of antimicrobial agents as preventive measure has been questioned, given extensive documentation of the evolution of antimicrobial resistance among pathogenic bacteria. So, the possibility of antibiotics ceasing to be used as growth stimulants for poultry and the concern about the side-effects of their use as therapeutic agents has produced a climate in which manufacturers are looking for alternatives. Probiotics are being considered to fill this gap and already some farmers use them in preference to antibiotics (Sadeq, 2010).

Probiotic and prebiotic foods have been consumed for centuries, either as natural components of food, or as fermented foods. Interest in intestinal microbiology and the dietary use of prebiotics and probiotics blossomed in the late 1800s and early 1900. The growing enthusiasm was motivated by Escherichs isolation of *Escherichia coli* in the late 1800s, as well as, active research on the benefits of feeding lactic acid bacteria and lactose near the turn of the 20th century (Rettger and Cheplin, 1921). Numerous *in vivo* and *in vitro* studies since then have shown that the commensal intestinal microbiota inhibit pathogens and disturbances of this intestinal microbiota can increase susceptibility to infection, and that addition of prebiotics and probiotics decrease infection of pathogenic bacteria (Rolf, 2000).

The impact of biotechnology in poultry nutrition is of significant importance. Biotechnology plays a vital role in

the poultry feed industry. Nutritionists are continually putting their efforts into producing better and more economical feed. Good feed alone will not serve the purpose but its better utilization is also very essential. Dietary changes, as well as, lack of a healthy diet can influence the balance of the microflora in the gut thus predisposing it to digestion upsets. A well-balanced ration sufficient in energy and nutrients is also of great importance in maintaining a healthy gut. In broiler nutrition, probiotic species belonging to *Lactobacillus*, *Streptococcus*, *Bacillus*, *Bifidobacterium*, *Enterococcus*, *Aspergillus Candida*, and *Saccharomyces* have beneficial effects on broiler performance (Tortuero and Fernandez, 1995; Ashayerizadeh *et al.*, 2009).

Probiotic strains have been shown to inhibit pathogenic bacteria both *in vitro* and *in vivo* through several different mechanisms. Probiotics in poultry maintaining normal intestinal microflora by competitive exclusion and antagonism (Nurmi and Rantala 1973; Fuller 1989; Jin *et al.*, 1998; Line 1998; Rantala and Nurmi 1973; Kabir *et al.*, 2005; Kizerwetter and Binek 2009), alter metabolism by increasing digestive enzyme activity and decreasing bacterial enzyme activity and ammonia production (Tortuero and Fernandez 1995; Mandal *et al.*, 1996; MaCracken and Gaskins 1999; Panda *et al.*, 1999; Singh *et al.* 1999; Jin *et al.*, 2000; Islam *et al.*, 2004; Kabir *et al.*, 2004; Yoon *et al.*, 2004; Nayebpor *et al.*, 2007), improve feed intake and stimulate the immune system (Baidy *et al.*, 1994; MaCracken and Gaskins 1999; Kabir *et al.*, 2004; Haghighi *et al.*, 2005; Nayebpor *et al.*, 2007; Apata, 2008).

The objective of this study was to investigate the effect of a commercial probiotic containing *Lactobacillus acidophilus* on body weight, dressing percentage, feed conversion ratio (FCR) and weight of internal organs.

MATERIALS AND METHODS

A total of 520 day old broiler chicks (Ross 308) were randomly divided into four groups with two replicate and reared on the floor pens for 42 days. Chicks were housed in an environmentally controlled broiler house with floor covered with wood shavings. Birds were fed a commercial starter mash from 1-21 days of age, and grower mash from 22-42 days of age (Table 1). Commercial probiotic lypholac (microbiotech USA) containing *Lactobacillus acidophilus* (1×10^8 cfu/gm) obtained from Veterinary Directorate Duhok was used (the recommended commercial dose was 10ml/10000 birds). Chicks in group one (T1) were supplied with probiotic in drinking water daily until 42 days of age. Chicks in group two (T2) were supplied with probiotic in drinking water weekly, group three chicks (T3) were supplied with probiotic from 21 days to 42 days, whereas the control group (T4) did not receive a probiotic. The body weight and feed conversion ratio of each group was determined, and five birds in each group were scarified for dressing percentage, weight of liver, gizzard, spleen and heart.

RESULTS AND DISCUSSION

The impact of probiotic supplementation in the current study revealed that the parameters studied in this study did not change significantly under the effect different schedule of probiotics treatment (Table 1). Body weight gain was not significant; however, it was numerically superior in T1 compared to the other treatments. The increased body weight gain in chicks fed probiotic may be due to improvement in digestibility and availability of many nutrients such as proteins, fats and carbohydrates, as well as, some mineral elements and vitamins (Burkholder *et al.*, 2005). It was noted that many of the beneficial bacteria enhance the effect of endogenous enzyme that produces naturally within the gastrointestinal tract (Naji *et al.*, 2009).

Probiotic provides nutrients, effectively stimulates the growth of beneficial microflora in the small and large intestines resulting in the better balance of bacterium population (Yusrizal and Chen, 2003; Midilli *et al.*, 2008; Capcarová *et al.*, 2011). As shown in Table 2, the weight of internal organs (heart, spleen, liver, gizzard and fat) for all groups showed no significant differences among treatment groups. Our results is in line with that of Mirza (2009) found that the dietary supplementation of broilers with probiotic and symbiotic had no significant effect on the heart, liver and gizzard percentage when compared with control at 42 days of age.

In conclusion, no effect of the current regimen of the probiotics feeding was found in broilers.

| Parameters | T1 | T2 | T3 | T4 |
|-----------------------------|---------|---------|---------|---------|
| Body weight (gm) | 1919.00 | 1815.00 | 1770.00 | 1860.00 |
| Dressing percentage (%) | 75.50 | 76.00 | 75.00 | 75.1 |
| Feed conversion ratio (FCR) | 1.68 | 1.73 | 1.75 | 1.73 |
| Heart (%) | 0.4 | 0.38 | 0.45 | 0.37 |
| Spleen (%) | 0.11 | 0.11 | 0.12 | 0.08 |
| Liver (%) | 2.02 | 2.13 | 2.22 | 1.76 |
| Gizzard (%) | 1.3 | 1.9 | 1.28 | 1.2 |
| Fat (%) | 1.05 | 1.15 | 0.75 | 0.76 |

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