ORBIT PROBIOTIC IS AN ALTERNATIVE FOR BETTER GROWTH PERFORMANCE OF BROILERS

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ABSTRACT
In the poultry industry, antibiotics are used worldwide to prevent poultry pathogens and diseases so as to improve meat and egg production. However, the use of dietary antibiotics resulted in common problems such as development of drug-resistant bacteria, drug residues in the body of the birds Intestinal bacteria play an important role in the nutritional, physiological, immunological and protective functions of the host and can be influenced by the diet. An alternative approach to sub-therapeutic antibiotics in livestock is the use of Probiotic (microorganisms), Probiotic substrates that enrich certain bacterial populations or enzymes which stimulate the digestion, and Synbiotics (combinations of probiotic and probiotic). During this study we evaluate the effects of probiotic, probiotic and Orbit Probiotic (combination of probiotic and enzymes) and found that Orbit Probiotic is more suitable for overall better growth performance significantly and hematological parameters as compare to control and probiotic and probiotic alone.

KEYWORDS: Probiotic, Probiotic, Orbit Probiotic, Synbiotics, Hematology.

INTRODUCTION
Over the last fifty years the worlds’ poultry production has almost quadrupled. Moreover, over the last eight years, the costs of poultry feed ingredients have increased considerably. This has been due to a greater global feed grain demand and an increased use of corn for ethanol production. Nowadays, the efficiency of poultry to convert the feed into meat plays a key role in economics in broiler industry. In fact, the 70% of total cost of production is contributed by feed[11] Therefore, improvement of feed conversion ratio (FCR) will considerably increase the margin of profit.
Poultry is one of the major parts to meet the demand of the dietary protein and our economic development. In the poultry industry, antibiotics are used worldwide to prevent poultry pathogens and diseases so as to improve meat and egg production. However, the use of dietary antibiotics resulted in common problems such as development of drug-resistant bacteria,[2] drug residues in the body of the birds,[3] and imbalance of normal microflora.[4] As a consequence, it has become necessary to develop alternatives using either beneficial microorganisms or nondigestible ingredients that enhance microbial growth.

Intestinal bacteria play an important role in the nutritional, physiological, immunological, and protective functions of the host[5] and can be influenced by the diet.[6] An alternative approach to sub-therapeutic antibiotics in livestock is the use of probiotic microorganisms, probiotic substrates that enrich certain bacterial populations, or synbiotics combinations of probiotic and probiotic. Probiotic are polysaccharides and oligosaccharides which cannot be digested effectively by the animal, but are readily fermented by anaerobic, colonic bacteria that are regarded as beneficial.[7] Probiotic have shown promise in controlling pathogens such as Salmonella and Escherichia coli and in stimulating the growth of bifidobacteria and lactobacilli, thus promoting health and performance of animals.[7,8] Probiotic and direct-fed microbial feed supplements have been confirmed in numerous scientific investigations to modulate the composition of the gut microflora by successfully competing with pathogens through a competitive exclusion process.[9,10] They modify the intestinal environment by reducing the pH, supplying digestion enzymes and increasing enzyme activity in the gastrointestinal tract.[11,12]

A way of potentiating the efficacy of probiotic preparations may be the combination of both probiotic and enzymes as synbiotics, which may be defined as a mixture of probiotic and probiotic or enzymes that beneficially affects the host by improving the survival and implantation of live microbial dietary supplements in the gastrointestinal tract. After feeding of probiotic, improvements in growth performance and feed efficiency have been reported in broiler chickens.[13,14] Therefore, probiotic are used to get rid of stress induced abnormalities in the gastrointestinal tract, thus normalizing gut activity. Research showed that additional benefits can be gained by supplementing broiler diets with probiotic as feed additives.[15]

Therefore, this study was conducted to generate more information about the effect of using probiotic and probiotic alone and in combination on performance and hematological characteristics in the diet of broiler chickens.
MATERIALS AND METHODS

An experimental trial was conducted at the poultry trial farm, Orbit Bioscience, India. The methodology of research trial and protocol was legally approved by the Orbit Bioscience’s ethical committee. The vaccinated chicks were randomly divided into three groups with one control (T₀) and three treatments (T_OP, T_X and T_Y) having 20 birds in each group with 3 replicates. Chicks in Group- T₀ were offered basal broiler starter and grower feed (as per NRC requirements) without any additional source of pre or probiotic, T_OP was supplemented with Orbit Probiotic (Manufactured by Orbit Bioscience, India) in the diet, T_X with prebiotic and T_Y with probiotic as per recommended dosage in the feed. The birds were reared under standard managemental conditions in deep litter system and offered ad-libitum feeding and watering. Orbit Probiotic is a combination of enzymes and probiotic (multiple strains), scientifically well known to growth stimulant. The inclusion of probiotic (X) and probiotic (Y) (undisclosed company) and the Orbit Probiotic (manufactured by Orbit Bioscience, India) were performed during the whole experimental periods (weekly).

Physical parameters

The physical parameters evaluated at 21 and 35 days of age were, weight gain, feed intake, feed conversion and viability.

Biochemical analysis

The serum biochemical estimations were carried out in 3 birds sacrificed at scheduled intervals from each group. The blood samples were collected directly from heart into tubes without anticoagulant for separation of serum. The serum samples were maintained at -20°C until analyzed. The individual serum samples were analyzed for Hematological profile. The biochemical estimations were done by using Automatic Biochemical Analyzer ‘3000 revolution’ made by Tulip's Diagnostic Pvt. Ltd., Mumbai. The methodology and the set of reagents used in respect of each parameter were as per the recommendations of the manufacturer of the analyzer system.

Statistical analysis

The data recorded was subjected to statistical analysis to quantify the variation between two treatments for various recorded parameters. Analysis of variance (ANOVA)- The data was analyzed using GENSTAT version 32.0. The sources of factors were various treatments. For better interpretation of the significant results, coefficient of variance (CV) and least
significant differences (LSD) were calculated. The values of CV and LSD indicate the
treatment to be statistically at par or not.

RESULTS AND DISCUSSION
Maximum mean body weight gain (1956.93 gm at 35 days age was observed with the
supplementation of Orbit probiotic @ 1.61 feed conversion rate followed by 1912.74 gm was
observed with the supplementation of probiotic @ 1.71 and then 1896.45 gm in the group of
probiotic supplemented as compare to 1767.46 gm in control, which was not fed with any pre
or probiotic. In the present study, beneficial effects of a probiotic, prebiotic and Orbit
probiotic products on FCR are in good agreement with previous studies of [16, 17] reported
that using these additives in the broiler ration has non-significant effects on FCR of broiler
chickens.

Table 1: Effects of probiotic, probiotic and Orbit Probiotic on growth performance.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weight gain (gm.)</th>
<th>Feed intake (gm.)</th>
<th>Feed conversion rate</th>
<th>Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (T₀)</td>
<td>1767.46</td>
<td>3216.78</td>
<td>1.82</td>
<td>5.9</td>
</tr>
<tr>
<td>Probiotic (Tₓ)</td>
<td>1912.74</td>
<td>32.70.78</td>
<td>1.71</td>
<td>1.2</td>
</tr>
<tr>
<td>Probiotic (Tᵧ)</td>
<td>1896.45</td>
<td>3318.78</td>
<td>1.75</td>
<td>1.6</td>
</tr>
<tr>
<td>Orbit Probiotic (Tₒp)</td>
<td>1956.93</td>
<td>3143.34</td>
<td>1.61</td>
<td>0.8</td>
</tr>
<tr>
<td>LSD</td>
<td>10.13</td>
<td>24.35</td>
<td>0.15</td>
<td>1.81</td>
</tr>
<tr>
<td>CV</td>
<td>1.02</td>
<td>1.72</td>
<td>1.05</td>
<td>0.23</td>
</tr>
<tr>
<td>SE</td>
<td>5.15</td>
<td>9.43</td>
<td>0.14</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Table 2: Effects of probiotic, probiotic and Orbit Probiotic on hematological profile.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Hb (g/dl)</th>
<th>TEC (X 10⁶/µl)</th>
<th>TLC (X 10³/µl)</th>
<th>PCV (%)</th>
<th>ALT (IU/L)</th>
<th>AST (IU/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (T₀)</td>
<td>10.1</td>
<td>2.2</td>
<td>25.2</td>
<td>24.3</td>
<td>11.4</td>
<td>55.4</td>
</tr>
<tr>
<td>Probiotic (Tₓ)</td>
<td>10.3</td>
<td>2.3</td>
<td>24.4</td>
<td>25.1</td>
<td>10.2</td>
<td>55.7</td>
</tr>
<tr>
<td>Probiotic (Tᵧ)</td>
<td>10.4</td>
<td>2.8</td>
<td>19.4</td>
<td>25.4</td>
<td>10.3</td>
<td>57.3</td>
</tr>
<tr>
<td>Orbit Probiotic (Tₒp)</td>
<td>11.1</td>
<td>2.5</td>
<td>23.4</td>
<td>28.4</td>
<td>11.2</td>
<td>61.05</td>
</tr>
<tr>
<td>LSD</td>
<td>2.1</td>
<td>0.12</td>
<td>0.39</td>
<td>2.05</td>
<td>2.34</td>
<td>2.43</td>
</tr>
<tr>
<td>CV</td>
<td>0.8</td>
<td>0.45</td>
<td>2.12</td>
<td>2.13</td>
<td>1.45</td>
<td>3.4</td>
</tr>
<tr>
<td>SE</td>
<td>1.34</td>
<td>0.15</td>
<td>0.72</td>
<td>0.28</td>
<td>1.46</td>
<td>1.39</td>
</tr>
</tbody>
</table>

Average total feed intake (g) found was significantly (P<0.05) higher in different treatment
groups like Tₓ, Tᵧ and Tₒp as compared to control T₀ group (Table I). Similar findings were
also reported by many workers.[18,19] Experimental groups supplemented with probiotic,
probiotic and Orbit Probiotic showed significantly (P < 0.05) higher value for body weight
gain in terms of total body weight (g) gain as compared to control group (Table I). This could
be due to beneficial effects of probiotic, probiotic and Orbit Probiotic (combination of multiple enzymes and micro-flora) supplementation which have promoted favorable condition in the intestine for the colonization of beneficial micro-flora, which have further facilitated better growth performance of broiler chicks. Many workers reported significant beneficial effect of supplementation of probiotic.\,[19,20]\) Orbit Probiotic is the combination of multiple enzymes and various microorganisms’ strains, synergistic actions of enzymes and microorganisms’ strains boosts the growth of bird far better as compare to probiotic and probiotic alone.\,[16]\)

Improvement in body weight in supplemented groups T_X, T_Y and T_OP might be due to better feed utilization and nutrient availability to birds. Least mortality was observed in the group of orbit probiotic supplemented followed by probiotic and probiotic as compare to control. Several mechanisms are anticipated to explain the positive effects of probiotic on broiler performance and health. This includes reducing disease incidence by inhibiting gut lining colonization by pathogenic bacteria, prevention of proliferation and toxins production by reduction of intestinal pathogens.\,[21]\) Probiotic have been reported to prevent gut colonization by pathogenic bacteria, such as \(C\). \(perfringens\), \(Escherichia coli\), \(Campylobacter spp\). and \(Salmonella spp\). through the mechanism of competitive exclusion.

Table 2 concluded that there exists a non-significant \((p>0.05)\) difference among the mean values of TEC corresponding to the different treatments. On the other hand there exists a significant \((p<0.05)\) difference among the mean values of Hb and PCV corresponding to the different treatments. It was shown that erythrocyte number for Orbit probiotic supplemented group (2.50) and probiotic supplemented group (2.8) were not significant \((p>0.05)\) compared to that of control group (2.2). Hemoglobin concentration increased significantly \((p<0.05)\) for orbit probiotic supplemented group (11.1) and probiotic supplemented group (10.4) as compared to that of control group (10.1). Packed cell volume of the broilers increased significantly \((p<0.05)\) for Orbit probiotic supplemented group (28.4), probiotic supplemented group (25.4) and probiotic (25.1) as compared to that of control group (24.3). ALT was decreased non significantly \((p<0.05)\) for Orbit probiotic supplemented group (11.2), probiotic supplemented group (10.3) and probiotic (10.2) as compared to that of control group (11.4) whereas AST was increased non significantly \((p<0.05)\) for Orbit probiotic supplemented group (61.05), probiotic supplemented group (57.3) and probiotic (55.7) as compared to that of control group (55.4).
However, activities of both AST and ALT in present study were within the normal physiological range and did not differ significantly ($P<0.05$) among dietary treatments. Present findings are in consonance with the findings reported by different research workers. Abdel-Fattah and Fararh 2009\textsuperscript{[22]} found non-significant effect of probiotic, probiotic and synbiotics supplementation on serum AST and ALT values in broiler birds. Similar non-significant effect was reported on probiotic and synbiotics supplementation\textsuperscript{[23]} in broilers.

In this study, the effects of a Orbit Probiotic, probiotic and probiotic product on hematological parameters are in agreement with previous study\textsuperscript{[24]} who reported that the mean values of Hb, PCV and erythrocyte sedimentation rate (ESR) corresponding to the different treatments were significantly ($p<0.01$) differ.

**CONCLUSION**

Study suggested that Orbit Probiotic which is the unique combination of probiotics and multiple enzymes, showed significantly better growth performance and hematological parameters as compare to probiotic, prebiotic and control.

**REFERENCES**


