**Original research article**

# EVALUATION OF THE EFFECT OF PROBIOTICS ON GROWTH PERFORMANCE IN BACKYARD POULTRY FARMING


## ABSTRACT

Early chick mortality is a common issue in improved germplasm of desi birds under backyard system of rearing. Probiotics is one of the feed additives to decrease chick mortality. Hence, The present study aimed to evaluate the effect of probeads EC on growth performance and livability of vanaraja chicks. This study was conducted at Mangalapuram and Thussur villages of Namakkal district. A total no of 400 nos of vanaraja chicks were distributed to 4 woman groups. Each group consists of 4 replicates with 20 chicks in each. Group I was taken as control (C), Group II was supplemented with probeads EC once in two days (T1), Group III was supplemented with probeadsEConce in a week (T2) and Group IV was supplemented with probeads EC only day old chicks (T3) and Group V was supplemented with oxytetracycline continuously three days from day old (T4). All the treatment groups were supplemented with 5 beads per bird. The present study revealed T1was significantly ($P<0.05$) increased body weight compared to T2, T3 and control during second and fourth weeks of age of vanaraja chicks. The livability of vanaraja chicks was 87.21, 86.43, 83.52, 79.23 & 77.26 % in T4, T1, T2, control and T3 respectively. The present study concluded that supplementation probeads EC once in two days increased body weight and livability of vanaraja chicken compared to control.



***Key words:*** *Probeads; Vanaraja; Backyard; livability; body weight.*


## INTRODUCTION

Native chicken breed are highly disease resistant reared under backyard. The native germ plasm is comparatively resistant to pathogenic diseases and heat. However, the losses in the backyard poultry are mainly due to lack of scientific management of chicks up to one month results in higher early chick mortality contribute significant economical losses in backyard poultry. The maximum body weight gain not obtained due to lack of scientific knowledge on feeding and feed additives in backyard farming. Recently, improved germplasm of desi bird introduced in backyard poultry rearing. These improved varieties are less disease resistant and heat tolerant. However, the body weight gain, egg production was higher than the native breed of chicken.

Dietary changes, scavenging of feed in contaminated area and poor feed quality change the gut micro flora which disturbed gut health in backyard poultry (LutfulKabir, 2009). The drinking water and feed as the source of salmonella contamination in backyard chicken (Samanta *et al*., 2014). Salmonella infection in young poultry causes pasty vent, weight loss, death and most of the time infection is subclinical (Beam *et al*., 2013). Antibiotics used as therapeutic to decrease early chick mortality in backyard poultry farming. Indiscriminate use of antimicrobials developed and disseminated antimicrobial resistance (AMR) is a global issue (Verraes *et al*., 2013). In 2020, World health organization classified AMR as a global health issue. We need to find alternatives to antibiotics to mitigate AMR. WHO defined probioticsare “live microorganisms which when administeredin adequate amounts confer a health benefit on the host” (Krysiak *et al*., 2021). The probiotics should resistant to acidic pH and easily attach to the epithelium of the intestine and maintain the gut microbes (Kabir, 2009). Non - spore forming probiotics are

non viable in acidic environment of gizzard. Probeads is the products of mixture of probiotics protect from gastric pH and deliver non spore forming probiotics to intestine. Hence the present study proposed to study the effect of probiotics on growth performance and economics in backyard chicken farming.

## MATERIALS AND METHODS

Thison farm trial was conducted at farmers field of Namakkal district in Tamil Nadu. A total no of 400 nos of vanaraja chicks were distributed to 4 woman groups. Each group consists of 4 replicates with 20 chicks in each. Group I was taken as control (C), Group II was supplemented with probeads EC once in two days (T1), Group III was supplemented with probeads EC once in a week (T2), Group IV was supplemented with probeads EC only day old chicks (T3)and Group V was supplemented with oxytetracycline continuously three days from day old (T4). The probeadswere supplemented with 5 beads per bird. The experiment was conducted for the period of 12 weeks. The individual bird body weight and feed intake were recorded and feed conversion ratio was derived for every fortnight. Livability (%) was recorded during the experimental period. The data collected on various parameters were statistically analyzed as per the method of Snedecor and Cochran (1989) and the means of different experimental groups were tested for statistical significance by Duncan's multiple range test (Duncan, 1955).

## RESULTS AND DISCUSSION

The effect of probeads EC on live body weight, cumulative feed intake, cumulative FCR was shown in Table 1. The cumulative body weight was significantly ($P<0.01$) higher in T1 and T4 compared to control, T2 and T3 at the end of second week and T1 was significantly ($P<0.01$) higher body weight compared to control and remaining treatment groups at the end of fourth week. However, probeads EC not significantly influenced live body weight from sixth week to twelfth weeks of age. In contrast, Shibi and Jeyalalitha (2022), found that probeads significantly increased body weight at the end of second to eight weeks of age. TANUVAS Aseel chicken fed with probeadssignificantly increased body weight up to 10 weeks of age (Thangadurai *et al*., 2024). Dietary supplementation of probeads EC significantly increased body weight from fourth to tenth weeks (Murugan *et al*., 2022). Desi chicken fed with probiotics significantly increased the body weight for 6 weeks (Amer and khan, 2012).

The cumulative feed intake was not influenced by probeads EC in the present study. Similarly, probeads EC not significantly affected cumulative feed intake in Aseel cross chicken (Shibi and Jeyalalitha, 2022). Similar to results of the current study, the feed intake was not influenced by probiotics supplementation in vanarajachicken (Swain *et al*., 2016).In contrast to results of the present study, the daily feed intake was significantly increased up to 10$^{th}$ weeks of age in desi chicken (Murugan *et al*., 2022; Thangadurai *et al*., 2024).

**Table 1.** Effect of probeads EC supplementation on growth performance of vanaraja chicken

| Age in weeks | Control | T1 | T2 | T3 | T4 | Pooled SEM | P value |
|---|---|---|---|---|---|---|---|
| **Body weight** | | | | | | | |
| **Day old** | 32.25 | 32.24 | 32.23 | 32.25 | 32.27 | 0.005 | 0.281 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2nd week** | 117.67[a] | 133.67[b] | 121.33[a] | 123.33[a] | 132.86[b] | 1.89 | 0.003 |
| **4th week** | 291.33[a] | 314.00[b] | 294.33[a] | 293.33[a] | 299.67[a] | 2.44 | 0.001 |
| **6th week** | 512.00 | 533.33 | 519.67 | 522.33 | 532.21 | 3.52 | 0.294 |
| **8th week** | 744.31 | 770.24 | 752.46 | 751.72 | 758.67 | 5.71 | 0.739 |
| **10th week** | 882.14 | 904.74 | 903.81 | 897.25 | 891.27 | 6.28 | 0.827 |
| **12th week** | 1012.37 | 1044.29 | 1025.51 | 1029.67 | 1031.55 | 7.33 | 0.798 |
| **Cumulative Feed intake** | | | | | | | |
| **2nd week** | 102.19 | 113.33 | 115.11 | 117.33 | 121.67 | 2.80 | 0.25 |
| **4th week** | 469.33 | 480.67 | 483.67 | 484.23 | 489.11 | 3.46 | 0.50 |
| **6th week** | 982.67 | 993.22 | 995.33 | 997.15 | 1001.33 | 4.58 | 0.81 |
| **8th week** | 1759.19 | 1769.09 | 1771.86 | 1773.0 | 1778.37 | 4.06 | 0.70 |
| **10th week** | 2848.63 | 2859.64 | 2861.93 | 2863.36 | 2867.32 | 5.98 | 0.92 |
| **12th week** | 4260.14 | 4271.28 | 4273.52 | 4275.93 | 4279.43 | 8.54 | 0.97 |
| **. Cumulative feed conversion ratio** | | | | | | | |
| **2nd week** | 0.87 | 0.85 | 0.95 | 0.95 | 0.92 | 0.017 | 0.180 |
| **4th week** | 1.61 | 1.53 | 1.64 | 1.65 | 1.64 | 0.016 | 0.052 |
| **6th week** | 1.92 | 1.86 | 1.92 | 1.91 | 1.88 | 0.016 | 0.768 |
| **8th week** | 2.37 | 2.30 | 2.36 | 2.35 | 2.37 | 0.015 | 0.654 |
| **10thweek** | 3.23 | 3.16 | 3.17 | 3.20 | 3.22 | 0.018 | 0.732 |
| **12th week** | 4.21 | 4.09 | 4.17 | 4.15 | 4.14 | 0.025 | 0.726 |
| **Livability (%)** | | | | | | | |
| **0-12 weeks** | 79.23[a] | 86.43[b] | 83.52[ab] | 77.26[a] | 87.21[b] | 1.29 | 0.014 |

Means bearing dissimilar superscripts vary significantly, each treatment group consisted of 4 replicates (n=20/replicates).

In this study, the Feed Conversion Ratio (FCR) was not affected by supplementation of Probeads EC in Vanaraja chicken. In contrast, FCR was significantly improved in Aseel cross chicken supplemented with probeadsEC (Shibi and Jeyalalitha, 2022; Murugan *et al*., 2022; Thangadurai *et al*., 2024). Probiotics supplementation significantly increased FCR in desi chicken (Amer and khan, 2012), Vanaraja chicken (Swain *et al*., 2016).

The improved growth performance of Vanaraja chicken during early phase of growth might be due to *Bacillus firmus, Bacillus subtilis, Enterococcus feacium, Enterococcus faecalis* and *Saccaromyces cerevisiae* used in probeads EC. The probiotics possess the ability to secrete antimicrobial substances, attach mucosa, competitive exclusion of pathogen and intestinal epithelium and increase the strength of gut epithelial barrier of the birds (Collado *et al.,* 2010). Mechanism by which Probeads improved body weight during early phase of growth due to changeof intestinal ecosystem by supplying digestion enzymes, reducing pH, and increasing the activity of enzymes in the gastrointestinal tract (Kabir, 2009; Abd El-Hack *et al*., 2020).

Livability is one of the important parameters increase the profit in backyard farming. In this study, the livability was significantly higher in T1 and T4 compared to T2, T3 and control group at the end of experiment. Similarly, probiotics supplementation decreased mortality in desi birds (Panda *et al* 2000;

Amer and khan, 2012). In contrast to results of the present study, probeads EC not significantly increased livability in desi chicken (Shibi and Jeyalalitha, 2022; Thangadurai *et al*., 2024). In this study, supplementation probeads EC once in two days perform s to antibiotics fed group. This may be due to feeding of probiotics suppress the pathogenic bacteria by competition for nutrients and binding sites on the intestinal epithelium to improve health of birds (Patterson and Burkholder, 2003).

**Table 2.Effect of probeads EC on economics of vanaraja chicken.**

| | Control | T1 | T2 | T3 | T4 |
|---|---|---|---|---|---|
| Gross Cost of production (Rs) | 2505.18 | 2757.23 | 2638.25 | 2463.38 | 2740.18 |
| Net Return (Rs) | 5614.71 | 6378.56 | 5995.54 | 5568.66 | 6297.30 |
| B:C ratio | 2.24 | 2.31 | 2.27 | 2.26 | 2.30 |

Means bearing dissimilar superscripts vary significantly, each treatment group consisted of 4 replicates (n=20/replicates).

The economics of vanaraja chicken was presented in Table.2. The gross cost of production was high in T1 compared to other treatments and control due to cost of probeads EC. However, the net return was higher in T1 compared to remaining treatment groups including control due to significant decreased in mortality. The BCR was high in T1 followed by T4, T2, T3 and control. Some of the authors reported that probiotics supplementation improved the net profit per bird due to high body weight gain and FCR (Swain *et al*., 2016; Thangadurai *et al*., 2024).

## CONCLUSION

The present study revealed that supplementation of probeads EC to day old vanaraja chicks once in two days increased body weight during early phase of life,increased livability at the end of experiment and improved BCR compared to probeads fed once in a week, only day old chicks, antibiotics and control without growth promoter.

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