CONSIDER

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

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Consider abstract to be single spaced, block paragraphed if the heading "ABSTRACT" is placed at the left hand margin. But, if the word "ABSTRACT" is centralized, the writing should start with a paragraph.

~~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.*

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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 probeads EC once 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 T1 was 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.

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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 healthin backyard poultry (LutfulKabir, 2009). The drinking water and feed as the source of salmonella contamination in backyard chicken (Samanta *et al*., 2014) ~~**(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) ~~**(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) ~~(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 probiotics are “live microorganisms which when administered in adequate amounts confer a health benefit on the host” (Krysiak *et al*., 2021) ~~**(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

This on 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), ~~**(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 probeads significantly increased body weight up to 10 weeks of age (Thangadurai *et al*., 2024). ~~**(Thangadurai et al., 2024).**~~ Dietary supplementation of probeads ECsignificantly increased body weight from fourth to tenth weeks (Murugan *et al*., 2022) ~~**(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 (Shibiand and Jeyalalitha, 2022) ~~**(Shibiand Jeyalalitha, 2022)**~~. Similar to results of the current study, the feed intake was not influenced by probiotics supplementation in vanaraja chicken (Swain *et al*., 2016) ~~**(Swain et al., 2016)**~~.In contrast to results of the present study, the daily feed intake was significantly increased up to 10th weeks of age in desi chicken (Murugan *et al*., 2022; Thangadurai *et al*., 2024) ~~**(Murugan et al., 2022 and 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 probeads EC (Shibi and Jeyalalitha, 2022; Murugan *et al*., 2022; Thangadurai *et al*., 2024) ~~**(Shibi and Jeyalalitha, 2022, Murugan et al., 2022 and Thangadurai et al., 2024)**~~. Probiotics supplementation significantly increased FCR in desi chicken (Amer and khan, 2012), Vanaraja chicken (Swain *et al*., 2016) ~~**(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 non spore forming probiotics possess the ability to attach to the intestinal epithelium of the birds (Jin *et al*., 1996 a) ~~**(Jin et al., 1996 a)**~~ **consider changing as the work is too old for the present studies** and competitively exclude the pathogenic bacteria *in vitro* (Jin *et al*., 1996 b) ~~**(Jin et al., 1996 b)**~~ **consider changing as the work is too old for the present studies**. Mechanism by which probeads improved body weight during early phase of growth due to enhancement of lactic acid producing beneficial bacteria and suppression of intestinal pathogen and increase digestion and utilization of the nutrients ~~**(Yeo and Kim 1997)**~~ **consider changing as the work is too old for the present studies**.

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) ~~**(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) ~~**(Shibi and Jeyalalitha, 2022, and 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) ~~**(Swain et al., 2016 and Thangaduraiet 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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