RESEARCH ARTICLE Agricultural Science Digest, Volume 45 Issue 2: 350-352 (April 2025)

Effect of Probiotic (Probeads-Ec) Supplementation on the Growth Performance of Aseel Cross Chicks

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10.18805/ag.D-5464

ABSTRACT

Background: Supplementation of probiotics play an important role on the growth performance of native chicken to achieve early market weight. It has been observed that there was a development of resistance by pathogenic bacteria against antibiotic mixtures used in the feed as growth promoters. The major concern in using antibiotics is presence of residues in the egg and meat. Probiotics are found to be an alternative to antibiotics to reduce the disease incidences and to improve feed efficiency.

Methods: Totally 100 numbers of day old Aseel cross chicks were selected and randomly divided into two groups of 50 chicks each. Chicks in control group (T_1) were fed with commercially available feed without probiotic supplementation and chicks in treatment group (T_2) were fed with probiotic supplemented commercial feed. Trial period was upto 10 weeks of age.

Result: Fortnightly body weight and body weight gain were significantly ($P<0.01$) higher in treatment group (T_2) compared to control group. Average daily weight gain and feed conversion ratio also highly ($P<0.01$) significant in treatment group.

Key words: Aseel cross chicks, Growth performance, Probiotics.

INTRODUCTION

In tropical region, rural poultry farming is getting popular because of minimum investment to rear as a backyard farming. Even though it is found to be economical, the maximum gain is not obtained in this system of rearing. Due to health awareness among the community, native chicken rearing is gaining importance since they were raised in the natural environment with supplemental feeding of grains.Supplementation of probiotics is necessary to improve the growth performance of native chicken to achieve early market weight. In the poultry industry, it has been observed that there was a development of resistance by pathogenic bacteria against antibiotic mixtures used in the feed as growth promoters. The major concern in using antibiotics is presence of residues in the egg and meat. To overcome this situation, alternatives to antibiotics need to be consideration for evaluation. Probiotics is the one such alternatives and they are defined as mono or mixed cultures of live microorganisms supplied in adequate quantity that confer a health benefit on the host (FAO/WHO, 2002).

The major advantage of using probiotics is that it will enhance nutrient utilization, feed conversionratio and health status of the host (Onifade *et al*., 1999). They were used in two ways, either through feed or water. Addition of probiotics through drinking water (1.5 g/L) has been reported to improve live weight gain in Gramapriya chicks (Swain *et al.,* 2011). Supplementation of *Lactobacillus sporogenes* at 100 mg/kg diet increased body weight gain, feed efficiency and humoral immune response in broiler chicks during 0-6 weeks of age (Panda *et al*., 2005). Keeping the views of above facts, present study has been designed to assess the effect of probiotics (Pro-beads EC) supplementation on the performance of desi chicken in the field conditions.

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How to cite this article: Murugan, M., Durairajan, R. and Devendran, P. (2025). Effect of Probiotic (Probeads-Ec) Supplementation on the Growth Performance of Aseel Cross Chicks. Agricultural Science Digest. 45(2): 350-352. doi: 10.18805/ag.D-5464.

Submitted: 26-07-2021 **Accepted:** 02-03-2022 **Online:** 17-03-2022

MATERIALS AND METHODS

This field trial was conducted at Veterinary University Training and Research Centre, Melmaruvathur during January 2020 to June 2020. Hundred day old Aseel cross chicks were purchased and they were divided into two groups of 50 chicks each. Control group I (T_1) were fed with commercially available feed without probiotic supplementation. Birds in group II (T_2) were fed with commercially available feed with probeads -EC (10^6 CFU/ bead: *Bacillus subtilis, Bacillus firmus, Lactobacillussp,* Yeast- *Saccharomycescerevisiae,* Cellulose acetate phthalate- 15% w/v, Excipients -q.s) which was developed at TRPVB, constituent unit of Tamilnadu Veterinary and Animal Sciences University, Chennai, India. First 2 weeks, chicks in both groups were fed with commercially poultry feeds for adaptation. From third week onwards, T_2 group was fed probeads-EC and T_1 was given only commercial feed. The trial was conducted for a period 10 weeks. During trial period, average daily feed intake, fortnightly body weight, average daily weight gain and feed conversion ratio were

recorded. The collected data were subjected to statistical analysis for their significance (Senedecor and Cochran, 1989).

RESULTS AND DISCUSSION

Effects on body weight

The mean body weight of chicks for the different periods revealed that there was a significant difference between probiotic supplemented group and control group (Table 1). It was 702.16±1.39 g in control group compared to treatment group (842.74±1.95 g). It was highly (P<0.01) significant on statistical analysis indicating that probiotics had a significant role in improving digestion and thereby better absorption for higher growth rate in Aseel cross chicks. Yan Wang *et al.* (2017) reported that chicken supplemented with Bacillus species showed beneficial effects in body weight. Similarly supplementation of probiotics mixture *(Lactobacillus sporogenes, Lactobacillus acidophilus and Saccharomyces cerevisiae)* @ 0.5 g/kg of feed had improved growth in broilers (Kaoud, 2010). In crossbred cockerels, supplementation of 2-3 ml of probiotics protexin/L in drinking water improved performance (Khan *et al*., 2013).

Table 1: Growth performance of Aseel cross chicks supplemented with probiotics (pro-beads).

Trait	Control	Treatment	't'	'P'
	Mean±S.E.	Mean±S.E.	statistic	value
Body weight (g)				
Initial	38.26±0.26	38.24±0.34	0.05$^{N.S.}$	0.96
2 weeks	96.12±0.48	96.06±0.44	0.09$^{N.S.}$	0.93
4 weeks	217.04±0.71	237.16±1.36	13.13**	0.00
6 weeks	360.46±0.90	430.92±1.23	46.29**	0.00
8 weeks	519.94±1.26	621.36±1.67	48.53**	0.00
10 weeks	702.16±1.39	842.74±1.95	58.64**	0.00
Weight gain (g)				
3-4 weeks	120.92±0.46	141.10±1.24	15.24**	0.00
5-6 weeks	143.42±0.65	193.76±1.30	34.56**	0.00
7-8 weeks	159.48±1.00	190.44±1.31	18.73**	0.00
9-10 weeks	182.22±1.08	221.38±1.85	18.30**	0.00
Average daily weight gain (g)				
3-4 weeks	8.64±0.03	10.08±0.09	15.24**	0.00
5-6 weeks	10.24±0.05	13.84±0.09	34.56**	0.00
7-8 weeks	11.39±0.07	13.60±0.09	18.73**	0.00
9-10 weeks	13.02±0.08	15.81±0.13	18.30**	0.00
Individual daily feed intake (g)				
3-4 weeks	22.86±1.25	21.47±1.35	0.76$^{N.S.}$	0.46
5-6 weeks	34.86±0.63	32.54±0.51	2.86*	0.01
7-8 weeks	43.09±0.41	39.37±0.33	7.05**	0.00
9-10 weeks	70.51±1.13	68.41±1.12	1.32$^{N.S.}$	0.20
Feed conversion ratio (FCR)				
3-4 weeks	2.65	2.13		
5-6 weeks	3.37	2.35		
7-8 weeks	3.82	2.89		
9-10 weeks	5.42	4.33		
Average	3.82±0.59	2.93±0.49	10.02**	0.00

N.S.- Not significant; **Significant at P<0.01; Significant P<0.05.

Both body weight gain and average daily weight gain revealed that there was significant difference from 4th weeks to 10th week of experiment between control and treatment groups. It was 120.92±0.46 Vs 141.10±1.24 g, respectively for the control (T_1) and treatment (T_2) groups for the 4th week and similar trends were noticed upto 10th week in Aseel cross chicks (182.22±1.08 Vs 221.38±1.85 g). With average daily gain, found significant difference and similar trends were noticed from 4th week (8.64±0.03 Vs 10.08±0.09 g respectively for control and treatment groups) to 10th week (13.02±0.08 Vs 15.81±0.13 g). Probiotic supplementation (*Bacillus subtilis, Bacillus firmus, Lactobacillu* ssp and *yeast- Saccharomyces cerevisiae*) in this feeding trial favoured better nutrient utilization and thereby significant increase in both body weight gain and ADG in Aseel cross chicks. These findings are in agreement with Wondimu and Yonas (2020) who observed that supplementation (*Lactobacillus, Bifidobacterium,* Coliforms and Clostridium species) through feed @ 30 mg/kg and 60 mg/kg had improvement in body weight gain of broilers.

Effects on daily feed intake

Average daily feed intake (Table 1) of chicks fed with probiotic supplemented diet and un supplemented diet as control from 4th to 10th week revealed that there was a significant difference during 5th to 8th week period (34.86±0.63 Vs 32.54±0.51 g for the 5-6 weeks and 43.09±0.41 Vs 39.37±0.33 g for the 7-8 weeks, respectively for the control and treatment groups) and it was not statistically significant in the first and last fortnight. Though there was not significant difference in all the fortnight, numerically less feed intake was observed in this experiment. These findings were in line with (Khan *et al*., 2013) who reported that probiotic feeding at a levels of 2 and 3 ml/L of drinking water decreased the feed intake significantly. In contrast, (Swain *et al*., 2016) reported that feed intake was not affected by the supplementation of probiotics.

Effects on feed conversion ratio

The cumulative feed conversion ratio of chicks (Table 1) fed with probiotic supplemented feed and unsupplemented feed as control revealed a statistically better feed efficiency (3.82±0.59 Vs 2.93±0.49). The possible reason for the better feed conversion may be alteration in the intestinal flora, enhancement of growth of non-pathogenic facultative anaerobic and gram positive bacteria forming lactic acid and hydrogen peroxide, suppression of growth of intestinal pathogens and enhancement of digestion and utilization of nutrients (Yeo and Kim, 1997). Similarly, Swain *et al.* (2016) reported that improvement in body weight gain and FCR of Vanaraja chicks fed probiotic supplementation through water might be due to *Lactobacillus* spp., *Bifidobacterium, Streptococcus faecium, Aspergillusoryzae* used in the supplement.

CONCLUSION

The overall observations of the present study revealed that supplementation of probiotics (Pro-beads EC) through feed in Aseel cross chicks improved body weight gain and FCR significantly.

ACKNOWLEDGEMENT

Authours are thankful to the Director, TRPVB unit of TANUVAS for providing Pro-beads EC for successful conduct of this experiment.

Conflict of interest

All authors declare that they have no conflict of interest.

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