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Effect of probiotics supplementation on the growth performance of Japanese quail broilers (*Coturnix coturnix japonica*)

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Abstract
The overuse of antibiotics may be harmful, which can cause resistance to pathogenic microorganisms and residues in meat and eggs. The study was conducted up to 4 weeks to evaluate the effect of probiotics supplementation on growth performance in Japanese quail. Totally 500 day old chicks randomly assigned to two groups (Treatment (T1) and control (T0) of 250 chicks each. 5 beads from Pro Beads EC®/bird/day were supplemented to the treatment group, and no beads were given to the control group. Body weight and body weight gain, Feed conversion ratio and Livability were recorded till marketing at weekly intervals. The above study concluded that supplementation of Probiotics (Probeads- EC®) improved the growth performance of Japanese quail broilers without negatively influencing the gut health.

Keywords: Japanese quail, Probiotics, gut health

Introduction
The search for natural alternatives to antibiotic growth promoters in order to maintain both performance and health in farmed animal is on the rise due to antibiotic residues in livestock and poultry products. Probiotics are live strain of selected microorganisms which when supplemented in adequate amounts; confer health benefit on the host. Inoculation of these beneficial organisms will reduce harmful bacteria colonization and improve gut health and thereby reduce chick mortality and improve growth performance. Brooder mortality (5-10%) is the major cause of economic loss in Japanese quails.

The use of antibiotics in Japanese quail is generally discouraged whereas indiscriminate use by famers is carried out. Therefore, the use of Probiotics as an alternative to antibiotic will be beneficial to the farmer and consumers. The major advantage of using probiotics is that it will enhance nutrient utilization, feed conversion ratio and health status of the host (Onifade *et al*., 1999) [2]. 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) [6]. 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) [3]. 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 Japanese quail in the field conditions.

Methodology
The study was conducted up to 4 weeks to evaluate the effect of probiotics supplementation on growth performance in Japanese quail at SAS Quail farm, Arumadal road, Perambalur district. The farmer rears Namakkal Quail I which is a popular variety of Broiler quail. Totally 500 day old chicks randomly assigned to two groups (Treatment and control) of 250 chicks each. The chicks in each group were raised under the same housed with standard floor space and fed ad libitum under standard managemental conditions.

A total of 5 beads from Probeads EC®/bird/day were given to the treatment group (Fig 1&2), and no beads were given to the control group up to 4 weeks. Probeads EC® is a mixed culture of probiotics having Bacillus subtilis, Bacillus firmus, Enterococcus faecalis and Enterococcus faecium and it contains 105cfu/beads. Probeads EC® is developed by Translational Research Platform for Veterinary Biologicals, TANUVAS, Chennai-51. The trial was carried out 3 times in successive batches. The parameters such as Body weight, Body weight gain, feed conversion ratio (FCR), livability were recorded from 50 birds randomly chosen in each group.

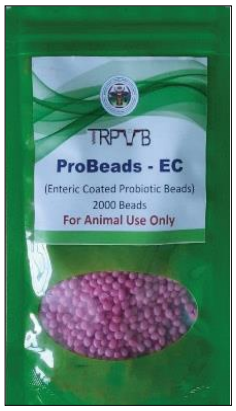

Fig 1: ProBeads – EC **Fig 2:** Probeads – EC Supplementation to Japanese quails

Results

The effect of supplementation of probeads on Mean body weight (g), body weight gain (g), Feed conversion ratio (FCR) and Liveability % of Japanese quail upto marketing age is shown in Table 1. Mean body weight (g) Japanese quail showed significant difference among treatment and control groups. The body weight at the market age (28 days) in the treatment and control group was 221.30 g and 198.54 g respectively. Similarly, the FCR also showed significant differences among the treatment (2.60) and control group (2.85) during the study. The cumulative FCR of 2.60 and 2.85 was observed in treatment and control group respectively, till the end of trail period. No significant differences were noticed in the livability among both the group.

Table 1: Mean body weight (g), body weight gain (g), Feed conversion ratio (FCR) and Liveability % of Japanese quail upto marketing age.

Treatment/Age	o day	1 week	2 week	3 week	4 week
Body weight (g)					
Basal diet (T0)	10.03±1.06	30.50±0.43	79.10 ±3.76	132.97±5.64	198.54^{a}±2.65
Probeads EC (T1)	10.70±1.26	31.40±0.68	85.80±2.25	141.60±2.88	221.30^{b}±2.07
Body weight gain(g)					
Basal diet (T0)		21.63±0.35	36.33±0.15	57.63±0.19	85.97±0.25
Probeads EC (T1)		20.47±0.24	41.60±0.18	50.87±0.25	91.40±0.35
Feed conversion ratio (FCR)					
Basal diet (T0)		1.73±0.05	2.89±0.41	2.95±0.60	2.85^{a}±0.32
Probeads EC (T1)		1.83±0.13	2.89±0.20	3.34±0.85	2.60^{b}±0.41
Liveability %					
Basal diet (T0)		97.85±1.25	98.15±1.90	99.15±0.65	100.00±0.00
Probeads EC (T1)		96.25±1.50	98.10±0.90	99.10±0.65	100.00±0.00

Means within a column with different superscript differ significantly (p<0.05)

Discussion

The gain in body weight observed in the trial may due to stimulating effect of probiotics which lead to better digestion and absorption of nutrients which subsequently improves body weight. Improvement in growth performance and feed conversion ratio of Japanese quail may be attributed to the total effects of probiotics action including the maintenance of beneficial microbial population, improving feed intake and digestion and more efficient utilization of feeds. Banna (2010) [1] observed better feed conversion ratio (1.77) for birds supplemented with probiotics than control birds (1.87) in broiler up to 42 days. The result of the presents study is similar to the findings of Subhashini *et al*., (2018) [5] and Pandian *et al*., (2021) [4] in Japanese quail.

Summary or Conclusion

The above trial we could conclude that, supplementation of Probeads EC®had improved the body weight and body weight gain in Japanese quail. Similarly, supplementation of probeads on Japanese quail showed better feed efficiency and livability than control group.

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