

EFFECT OF IMPROVAL ON SOME PRODUCTIVE AND EGG QUALITY TRAITS IN VANARAJA CHICKEN

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ABSTRACT

An experiment was conducted to evaluate the response of laying Vanaraja hens to dietary supplementation of probiotic (Improval) for 7 months. A total of 200 Vanaraja layers at 24 weeks of age were randomly divided into two groups with four replicates of 25 birds in each and reared in deep litter system under standard management systems. It was distinct from the results that dietary inclusions of probiotic had significant effect ($P<0.05$) on feed consumption, feed conversion ratio, hen day egg production and hen housed egg production. The different egg quality traits viz. egg weight (g), shape index (%), yolk index, Haugh unit and shell thickness (mm) showed significant ($P<0.05$) improvement over the control groups. Lower mortality of layers was recorded in probiotic supplementation groups (3.38 ± 0.77) compared to control groups (6.29 ± 1.16). Therefore, Improval could be recommended as feed supplement to enhance productive performance and to improve egg quality and health status of laying Vanaraja hens.

Key words: Probiotic, FCR, egg production, egg quality, mortality, Vanaraja hens.

Probiotics are live microbial feed supplements which beneficially affect the host by improving its intestinal microbial balance as reported by some authors^{5 & 9}. As a consequence of this, there is an improvement in the intestinal environment, increasing the efficiency of digestion and nutrient absorption processes, which may improve the performance. Several researchers⁶

showed improvements in feed intake, feed conversion and egg production ($P<0.05$) of layers when 500 mg of *B. subtilis* culture per kg was added to the diets. Other researchers¹⁵ reported that hens fed the diets supplemented with the probiotic had greater ($P<0.01$) egg production, egg weight and eggshell thickness than hens fed the diets without the probiotic. Same way previous research work¹⁴ showed that the supplementation of 1.0 or 2.0 g probiotic (Lacto-Sacc) per kg diet brought about a significant ($P<0.01$) improvements in egg production and feed conversion ratio. The present experiment was designed to study the effect of 'Improval' a commercial product containing probiotics and enzymes as feed supplements to laying Vanaraja chicken diets on their performance and egg quality traits.

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MATERIALS AND METHODS

The present study was carried out at the Institutional Poultry Farm, Division of Livestock Production, ICAR Research Complex for NEH Region, Umiam, Meghalaya. A total of 200 numbers of Vanaraja layers at 24 weeks of age were randomly divided into two groups with four replicates of 25 birds in each and allotted on deep litter system under standard management systems up to 52 weeks. A standard basal diet recommended for Vanaraja layers was formulated and fed to the control groups. The basal diet consists of maize, rice polish, ground nut cake, Soya bean meal, fish meal, shell grit, common salt and mineral & vitamin premix. containing 2750 Kcal ME and 18% CP (calculated) and fed to control groups. The treatment groups were fed basal diet supplemented with commercial feed supplement called 'Improval', at the rate of 2.5 g per kg diet, which basically contained probiotics i.e. *Saccharomyces cerevisiae*, *Lactobacillus sporogenese*, with enzymes including phytase, cellulose, xylanase and pectinase, rich in calcium, phosphorous, carbohydrate and vitamins from Zydus Animal Health Limited, India. The different performance traits viz. feed consumption, feed conversion ratio, hen day egg production, hen housed egg production and mortality were recorded for the period of 24-52 weeks of age. To study the egg quality traits, 60 numbers of egg from each group were collected at 52nd week of production and evaluated for egg weight, shape index, albumen index, yolk index, Haugh unit and shell thickness following the standard procedures. The data were analyzed as per standard statistical procedures ¹⁰.

RESULTS AND DISCUSSION

The results of different performance and egg quality traits of Vanaraja layers are presented in Table 1. It was distinct from the results that dietary supplementation of Improval had significant effect ($P<0.05$) on the performance of Vanaraja layers. The feed consumption, feed conversion ratio, hen day egg production and hen housed egg

production were significantly ($P<0.05$) improved in the supplemented groups compared to control groups, which might be due to the effect of desirable microorganisms, enzymes and other nutrients present in the feed additive. The supplemented feed additive contained *Saccharomyces cerevisiae*, *Lactobacillus sporogenese*, with enzymes including phytase, cellulose, xylanase and pectinase and rich in calcium, phosphorous, carbohydrate and vitamins for which there was an improvement in the intestinal environment, increasing the efficiency of digestion and nutrient absorption processes leading to the improvement of the performance of laying hens observed in the present study. Our findings were in agreement with results of other research workers ^{6 & 11}. However, in contrast to the present findings, other research work ¹¹ reported no significant effect of probiotics on egg production, feed intake and feed conversion ratio among the experimental birds. This variability could be due to presence of various factors like strains, hybrids, age, plan of nutrition, nutrient composition of the diet, microbial population of gastrointestinal tract, levels of inclusion in the diet, duration of supplementation or other environmental conditions affecting probiotic activities.

The mortality of layers in supplemented group was lower compared to the control group although difference was statistically not significant ($P<0.05$). Previous study ³ showed that probiotic had the ability to reduce and control pathogenic bacteria inside the GI-tract, producing antimicrobial substances. Probiotics also showed high efficiency in reducing colonization of *Salmonella* and *Campylobacter* in the intestine. Moreover, they could modulate immunological response and suppressed inflammatory immune reactions in the intestinal walls preventing tissue damage and thus maintained good health and reduced mortality of layers as mentioned by the other research work ⁴.

Egg quality traits were found to be improved significantly ($P<0.05$) in supplemented groups compared to control groups. These improvements

in egg quality traits might be due to the fact that the supplemented feed additive influenced on the metabolic activity of the layer birds, which helped to assimilate more minerals and other nutrient from the absorption. In agreement with our findings, other work² reported higher egg weight from hens' diet containing mainly *Lactobacillus* microorganisms as compared to hens' fed the control diet. Similarly, several other researchers^{1 &}

⁸ reported positive effect of probiotic on one or more egg quality traits. In contrast to the present finding, other research work¹² reported no effect on egg shape index, yolk index and Haugh unit. However, the difference in the effect of biological additives might be confounded by variations in gut flora and environmental conditions as mentioned by other work⁷.

Table 1. Performance & egg quality traits of Vanaraja laying hens

Parameters	Vanaraja	
	Control group	Improval group
1. Average feed consumption/day/bird (g)	120.36 ^a ±2.79	123.87 ^b ±2.43
2. FCR(Kg of feed/dozen of egg)	4.54 ^b ±0.62	4.09 ^a ±0.39
3. Hen day egg production (%)	37.52 ^a ±3.88	41.77 ^b ±5.36
4. Hen housed egg production (%)	29.75 ^a ±2.56	32.68 ^b ±2.48
5. Mortality of layer (%)	6.29 ^a ±1.16	3.38 ^b ±0.77
6. Egg weight (g)	55.64 ^a ±1.61	59.03 ^b ±1.38
7. Shape index (%)	73.16 ^a ±0.97	74.88 ^b ±0.78
8. Yolk index	0.41 ^a ±0.009	0.43 ^b ±0.009
9. Haugh unit	81.49 ^a ±1.89	81.50 ^b ±3.39
10. Shell thickness(with membrane)	0.38 ^a ±0.01	0.39 ^b ±0.01

Means within a row with no common superscript differ significantly (p<0.05)

CONCLUSION

It was distinct from the results that dietary inclusions of Improval had significant (P<0.05) effect on feed consumption, feed conversion ratio, hen day egg production and hen housed egg production and also reducing the mortality of layers. It also improved almost all egg quality traits viz. egg weight, shape index, Haugh unit and yolk index and shell thickness. Therefore, the

commercial feed additive i.e. Improval could be supplemented for improvement of performance and egg qualities in diet of Vanaraja laying hens.

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