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Comparative production performance of multi colored broiler strains - Nandanam broiler-2 and Nandanam broiler-3 under intensive system of management

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Abstract

A total of 400 day old chicks comprising of two groups (T1- Nandanam broiler-2 and T2 - Nandanam broiler-3 chickens and) with four replicates of 50 chicks each and reared up to 8th week of age under intensive system. Production performance of birds was assessed based on biweekly bodyweight, feed conversion ratio and livability. The results revealed that there were no significant ($P>0.05$) differences observed in mean body weight (g) at initial growth periods, i.e., from 0-2 weeks of age between. Significantly higher ($P\leq 0.01$) mean body weight (g) was observed in Nandanam broiler-3 chickens from 4 to 8 weeks of age than Nandanam broiler-2 birds. Significantly better ($P\leq 0.01$) cumulative feed conversion ratio was recorded in Nandanam broiler-3 than Nandanam broiler-2 and per cent livability did not differ. It is concluded that Nandanam broiler-3 chickens had significantly higher production performance than Nandanam broiler-2 birds under intensive system of management.

Keywords: Production performance, colour broiler strains, Nandanam broiler-2, Nandanam broiler-3

Introduction

In India, intensive system of poultry farming has become an important small, medium and large scale poultry business. In India, the population of rural backyard poultry farming was 317 million as per the livestock census, 2019 and contributing significantly to the national egg and meat production and backyard poultry eggs and meat fetches a much higher price than that from commercial poultry. Small commercial units of intensively reared rural family poultry should be encouraged for substantial growth in rural areas, especially due to higher consumer preference for these bird's egg and meat. Nandanam Broiler 2 and Nandanam Broiler 3 birds have been developed by Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University. Nandanam Broiler-2, a synthetic multi plumage colored broiler strain developed for meat purpose. Nandanam Broiler-3 a synthetic multi plumage colored broiler variety developed by crossing Nandanam B2 and Vencobb through artificial insemination. These birds are multi-colored broiler strains having good disease resistance, good meat sensory attributes and brown colored eggs which are being promoted for rural poultry farming in Tamilnadu. Nandanam Broiler-2 has high livability and good feed efficiency and it can fit into an integrated rural farming system when compared with white feathered broiler type chicken [1]. Sankhyan and Thakur (2018) [2] developed "Himsamridhi" a location specific chicken variety using Dahlem Red and indigenous/native chicken and found comparatively better growth in Himsamridhi chicken than native chicken at farmer's flock in western Himalayan state of Himachal Pradesh, India. Improving the performance of crossbreeding with Rhode Island Red, White Leghorns, Light Sussex, Black Australorp, and other synthetic breeds was initiated and reported by many authors [2, 3, 4, 5]. Nowadays, rural poultry farmers are moving towards establishment of small scale intensive system of rearing of Nandanam Broiler-2 and Nandanam Broiler- 3 birds in Tamilnadu and very little information is available with respect to production performance of these birds under intensive system of rearing. Therefore, it is essential to identify location specific multi colored broiler variety suitable for intensive system of rearing to improve small scale poultry farming in Tamilnadu. Hence, this study was designed to evaluate the comparative production performance of multi colored broiler strains namely Nandanam broiler-2 and Nandanam broiler-3 under intensive system of management.

Materials and Methods

This study was conducted at the Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University, Chennai, India. A total of 400 day old chicks comprising of two groups (T1- Nandanam broiler-2 and T2 - Nandanam broiler-3 chickens and) with four replicates of 50 chicks each and reared up to 8th week of age. Birds were reared in cages from 0-4 weeks and then from 5-8 weeks in deep litter system and standard managerial conditions were followed throughout the experiment. All the birds were fed with standard broiler starter for 0-4 weeks and finisher diets for 5-8 weeks respectively. Feed and fresh water were provided ad libitum during this experiment. All the birds were vaccinated against Ranikhet disease on 5th, 28th and 56th day using RDVF, LaSota and RDVK strain, respectively. Production performance parameters namely live body weight; feed consumption and livability were recorded biweekly from 0 day to 8 weeks of age. Body weights were recorded biweekly by individual weighing of the birds of each replicate and feed consumption also recorded at the time of recording body weight. Feed conversion ratio was calculated from the feed consumption and live body weight gain, and

mortality was recorded daily throughout the experimental period. The recorded data were analyzed statistically as per Completely Randomized Design and all statements of statistical difference were based on $P \leq .05$ [6].

Results and Discussion

The data on comparative production performance of multi colored broiler strains- Nandanam broiler - 2 and Nandanam broiler -3 under intensive system of management was furnished in table 1. Statistical analysis revealed that there were no significant ($P > 0.05$) differences observed in mean body weight (g) at initial growth periods, i.e., from 0-2 weeks of age between these two color broiler strains. Significantly higher ($P \leq 0.01$) mean body weight (g) was observed in Nandanam broiler-3 chickens at 4th, 6th and 8th week of age than Nandanam broiler-2 birds. The mean body weight of the male and female at 8th week of age was also significantly higher ($P \leq 0.01$) in Nandanam broiler-3 than Nandanam broiler-2 birds. It is observed that the males at 8th week of age of both the genotypes were heavier than their respective females.

Table 1: Mean (\pm S.E.) comparative production performance of multi coloured broiler strains - Nandanam broiler-2 and Nandanam broiler -3

Parameters	Nandanam broiler-2	Nandanam broiler-3
Hatch weight ^{NS}	42.76 \pm 0.33	44.15 \pm 0.44
2 nd week body weight(g) ^{NS}	126.48 \pm 2.72	128.85 \pm 3.15
4 th week body weight(g)**	319.28 ^b \pm 9.60	342.46 ^a \pm 8.98
6 th week body weight (g) **	632.17 ^b \pm 13.27	735.78 ^a \pm 15.09
8 th week body weight (g) **	1075.40 ^b \pm 24.99	1299.14 ^a \pm 15.17
Male	1196.96 ^b \pm 40.98	1317.78 ^a \pm 28.75
Female	1011.42 ^b \pm 28.17	1290.75 ^a \pm 17.85
Feed conversion ratio (0-8 weeks)**	2.76 ^b \pm 0.04	2.52 ^a \pm 0.01
Livability up to 42 days (%) ^{NS}	91.00	92.00

** - Highly Significant ($p < 0.01$), * - Significant ($p < 0.05$),

Mean values having the same superscript in a row do not differ significantly.

The mean live body weight at 8th week of age recorded for Nandanam broiler-2 and Nandanam broiler-3 in this experiment was higher than the values reported by many researchers [7-15]. However, Kanagaraju *et al.* [16] reported that the Nandanam B3 birds fed with commercial broiler ration attained a body weight of 1.368 kg at 8 weeks of age, which was higher than the value recorded in the present study. Padhi *et al.* [17] developed a three-way cross (PD1 X IWI X PD3) for egg-type backyard chicken using male and female lines developed from exotic chickens and found that the cross attained a mean body weight of 624g and 511g in males and females at 8 weeks of age, which was lower than the values recorded in the present study. Significantly higher ($P \leq 0.01$) mean body weight at various ages recorded in Nandanam broiler-3 birds than Nandanam broiler-2 birds in this study might be due to their genetic makeup and ability to get higher weight gain with lesser feed consumption and better feed conversion ratio.

Significantly better ($P \leq 0.01$) mean cumulative feed conversion ratio was recorded in Nandanam broiler-3 (2.52) than Nandanam broiler-2 (2.76) in this study. The FCR value recorded for Nandanam broiler-2 (2.76) in this experiment was comparatively better than the value (2.90) reported by Sangilimadan *et al.* [9] (2014). However, Many authors [14-16] recorded a feed conversion ratio of 2.66, 2.75 and 2.80, respectively at 8th week of age in Nandanam broiler-3 birds which were lower than the FCR reported (2.52) in this study. Sangilimadan *et al.* [10] recorded better feed conversion ratio

of 2.40 at 8th week of age in F3-Nandanam broiler-3 birds than the present study. The FCR recorded in the present study was better than the reported FCR at 8 week of age in three-way cross (PD1 X IWI X PD3) by Padhi *et al.* [17] and in Gramapriya by Haunshi *et al.* [18]. Significantly better ($P \leq 0.01$) mean cumulative feed conversion ratio recorded in Nandanam broiler-3 birds in this study might be due to their genetic makeup and enhanced ability of digestion and absorption of nutrients than Nandanam broiler-2.

It was observed that there was no statistical significant difference in mean per cent livability between Nandanam broiler-2 than Nandanam broiler-3 birds. The mean per cent livability recorded for Nandanam broiler-2 (91.00) and Nandanam broiler-3 (92.00) in this experiment was higher than the values (86.29; 85.92) reported for the respective birds by Sangilimadan *et al.* [9, 10]. The mean per cent livability recorded for Nandanam broiler-3 (92.00) in this experiment was higher than the values (91.23; 91.00) reported by earlier researchers [14, 16].

Conclusion

The results of the present study indicated that significantly higher ($P \leq 0.01$) mean body weight; better cumulative feed conversion ratio and non significant difference in mean per cent livability were recorded in Nandanam broiler-3 than Nandanam broiler-2 birds when reared under intensive system of management. Hence, it could be concluded that Nandanam broiler-3 chickens can be utilized as a multi

colored meat-type bird for intensive system of rearing in tropical climatic condition of Tamil Nadu as these birds had significantly higher production performance than Nandanam broiler-2 birds. However, further research involving larger population of these two genotypes under intensive system of rearing in different geographical areas must be conducted for its suitability for large scale commercial poultry production in various climatic conditions in India.

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