

Research paper

Growth Performance of Poultry Genotypes under Intensive Management System

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ABSTRACT

The present experiment was conducted at Poultry Unit, Department of Animal Husbandry and Dairy Science, Dr. B. S. Konkan Krishi Vidyapeeth Dapoli, Maharashtra to assess the comparative growth performance and feed efficiency of poultry genotypes. The experiment was carried out on three different types of poultry genotypes viz., -Vanaraja (T1), Giriraja (T2) and Rhode Island Red (T3). For this experiment, 150 day old chicks were divided in five replications and each replicate have 10 birds. Results showed that Giriraja birds gain significantly higher daily body weight gain, weekly body weight gain and total body weight gain with superior feed conversion efficiency compared to Vanaraja and Rhode Island Red. The benefit cost ratio (B:C ratio) higher achieved by Giriraja birds. From the results of present investigation, it can be suggested that the rearing of Giriraja poultry birds are more beneficial and efficient than Vanaraja and RIR in Konkan Agro-climatic condition of Maharashtra.

Keywords: Feed efficiency, growth rate, poultry breeds, weight gain, net profit

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INTRODUCTION

Poultry production is one area of livestock production with significant contribution to human food production. The poultry sector in India can be characterized into three major production systems based on some selected parameters such as breed, flock size, housing, feed, health, technology, and bio-security. Indian agriculture sector contributes 28 per cent to the Gross Domestic Production (GDP) in India, among which 17 per cent of income comes from poultry alone. India is now the world's third largest egg producer and fifth major producer of chicken. Indian poultry industry is growing at the rate of 8 to 10 per cent for eggs and 15 to 20 per cent for broiler production (Shrivastava, 2011). Poultry sector is important in the sense that it is a significant source of supply of protein and nutrition in a household's nutritional intake. Poultry can be an important tool to fight against poverty and provides employment to 1.5 million people. Modern day poultry farming has attended a status of industry with all scientific modern inputs. The present day

meat type stocks can attend a body weight of more than two kg in less than 40 days of age with feed conversion ratio (FCR) of less than 1.8. However in remote rural areas where the scientific poultry farming is difficult, the free range or semi intensive poultry farming still plays an important role to cater the need of the village people. The farmers generally rear desi or indigenous birds having slow growth rate. So there is always demand for a better breed which can grow faster compared to desi birds without much change or little change in their husbandry and feeding practices followed by the farmers for the desi birds. Recently, some modern genetically superior stocks have been developed and evaluated in free range and intensive system (Padhi *et al.*, 2003). Hence, the present investigation was undertaken to evaluate growth performance of poultry breeds reared under Konkan Agro-climatic condition of Maharashtra.

MATERIAL AND METHODS

The experiment was conducted at Poultry Unit, Department of Animal Husbandry and Dairy

Science, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli. The 150 day old chicks of Vanaraja, Giriraja and Rhode Island Red were divided into five replications with 50 chicks of each poultry genotypes. After complete of four weeks of brooding, chicks were allotted into five replications and each replication has ten chicks. The birds were properly vaccinated and reared on under deep litter system for all group of birds. The experimental diets and drinking water were provided *ad libitum*. The birds were offered a standard chick crumbles diet for a period of three weeks (brooding period) after which a commercial grower crumbles diet was fed for an additional period of 12 weeks (*ad libitum*). On arrival, day old chicks were served clean water with glucose as anti-stress. The initial weights were taken and recorded on arrival and sources of heat put on in the brooder house. They were fed twice daily, the litter materials were replaced after the brooding stage and the sanitary/biosecurity was also maintained.

Data collection and analysis

Some pre-recorded data were utilized to experiment the growth performance of Vanaraja, Giriraja and RIR genotypes of birds. Body weight of day old chicks (g), daily body weight gain (g/bird), final body weight (g/bird), daily feed intake (g/bird), total feed intake (g/bird), feed conversion ratio and mortality rate (%) of all genotypes of poultry were studied to determine the performance. The individual body weight of per replicate was recorded at weekly intervals with electronic balance. Final body weights were taken on 12th weeks of age. The daily feed intake was estimated by subtracting the left over feed from the total feed offered during that day and finally the weekly feed intake was calculated for that particular week. The feed conversion ratio was derived by dividing the total feed consumed by total body weight gain and the mortality rate was recorded as it occurred during the experimental period. The data obtained were analyzed by Randomized Block Design. Analysis of variance was done for body weight gain feed consumption. The data were test the significance differences among all treatment means (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Chemical composition of experimental diets

The chemical composition of the experimental diets is presented in Table 1. The metabolisable energy values of the chick starter diet having 2800 Kcal/kg for starter chicks and 2850 Kcal/kg for grower chicks. The chicks crumble diets and grower crumbles diets consists of 19 and 18 per cent crude protein values, respectively. The crude fibre values of 6.00 per cent in chick starter and 5.00 per cent in grower crumbles were recorded for the experimental feed (AOAC, 2005). Aduku (2005) stated 2800 kcal/kg ME and 3000 kcal/kg ME required for starter and grower chicks, respectively.

Growth performance of experimental birds

The means of live body weight of Vanaraja, Giriraja and RIR are presented in Table 2. There were significant ($p < 0.05$) differences in live body weight of the all breeds of day old. The significantly ($p > 0.05$) higher live body weight gained by Giriraja birds than Vanaraja and RIR from day old to end of the experiment. The average live body weight of day-old chicks were higher recorded for Giriraja (32.60 g) followed by Rhode Island Red (31.40 g) and Vanaraja (29.00 g) and their corresponding average live body weight at 12 weeks of age as 2027.40, 1124.28 and 1897.32g, respectively. The significantly ($p > 0.5$) higher live body weight gain attained by Giriraja (1994.8g) as compared to RIR (1092.88g) and Vanaraja (1868.32g). The higher live body weights of Giriraja might be due to utilization of exotic germplasm for the development of Giriraja. The results of present experiment are agreement with Sola-Oja (2011), Deka *et al.* (2014) and Padhi *et al.* (2014). The higher bodyweight in intensive system might be due to the supplementation of balanced diet and other proper managerial care.

Body weight gain: The average data of body weight gain of experiment poultry genotypes are presented in Table 2. The average final body weight gain (g) of Vanaraja, Giriraja and RIR were found significantly differed ($p < 0.05$) during entire experimental period. The significantly ($p > 0.05$) higher body weight gain

Table 1: Chemical composition of experimental diet (DM basis)

Parameters	Chick crumbles	Grower crumbles
Energy (Kcal. ME/Kg)	2800	2850
Crude protein	19.00	18.00
Dry matter	88.00	88.00
Crude fat	4.00	4.00
Crude fiber	6.00	5.00
Nitrogen free extract	61.00	63.00
Total ash	4.00	4.5
Moisture	12.00	12.00
Calcium	1.00	1.0
Phosphorus	0.6	0.6

Table 2. Comparison of growth performance and feed intake (g/bird) of poultry genotypes inKonkan climatic condition

Parameters	Vanaraja	Giriraja	RIR
Hatch weight (g)	29.00 ^c	32.60 ^a	31.40 ^{ab}
Final live body wt. gain (g/bird)	1897.32 ^b	2027.40 ^a	1124.28 ^c
Actual body wt gain (g/bird)	1868.32 ^b	1994.80 ^a	1092.88 ^c
Weekly body wt. gain (g/bird)	155.69.03 ^b	166.23 ^a	91.07 ^c
Daily body wt. gain (g/bird)	22.24 ^b	23.74 ^a	13.01 ^c
Total feed intake (g/bird)	4881.24	5234.18	3348.93
Weekly feed intake (g/bird)	406.77 ^{ab}	436.18 ^a	279.07 ^c
Daily feed intake/bird/day (g)	58.11	62.31	39.86
Feed Conversion Ratio	2.57 ^a	2.58 ^{ab}	2.97 ^{cd}
Mortality rate (%)	-	-	-

^{a,b,c,d} means with different superscripts in a row are significantly different at $p < 0.05$)

Table: 3 Economic assessments of poultry genotypes of kept under Konkan agro-climatic condition

Attributes	Vanaraja	Giriraja	RIR
Cost of day-old chicks (INR.)	15.00	15.00	15.00
Total feed cost (feed cost@ INR.27/kg)	4.88	5.23	3.35
Total feed cost (INR.)	131.76	141.21	90.25
Miss. expenditure (labour, electricity, room rent etc. in INR.)	33.00	33.00	33.00
Total cost/bird (INR.)	179.76	189.21	138.25
Sale of manure and empty gunny bags (manure @ INR.3/kg and gunny bags@ INR.8/bag)	20.00	20.96	19.36
Average body weight/birds (kg)	1.89	2.03	1.12
Saleble price/bird (Giriraja, Vanaraja& RIR @ INR.200/kg live weight)	378.00	406.00	224.00
Total return/bird (INR.) [6 +8]	398.00	426.96	243.36
Net profit/bird (INR.)	218.24	237.75	105.11
B:C ratio [10/5]	1:2.21	1:2.25	1:1.76

attained by Giriraja (2027.40 g) followed by Vanaraja (1897.32 g) and RIR (1124.28 g). The results of present experiments are agreement with Thakur and Parmar (2011). Findings of the present experiment are in comparable with Khawaja et al. (2012). They observed that RIR breed gained higher body weight than Fayoumi and crossbred chickens at all ages of growing phase. Sahota et al. (2001) also observed lower body weight gain for desi birds than Rhode Island Red and White Leghorn chicks at 12 weeks of

age.

Feed intake of birds: The average data of feed intake of experimental poultry genotypes are presented in Table 2. The significantly ($p > 0.05$) higher feed intake consumed by Giriraja (5234.18 g) followed by Vanaraja (4881.24 g) and RIR (3348.93 g). The results of the present experiment are in agreement with Sahota et al. (2001)

Feed conversion ratio: The data of the average feed

conversion ratio are presented in Table 2. The average FCR for various genotypes showed significant ($p < 0.05$) difference during experimental period. The results showed that superior feed conversion ratio was found in Vanaraja (2.57) followed by Giriraja (2.58) and RIR (2.97). The finding of current experiment almost similar with Kalita *et al.* (2012) who recorded FCR for Vanaraja as 2.75. The data of mortality rate of poultry genotypes are presented in Table 2. During experimental period found zero per cent mortality rate. The results of present experiment are similar with Padhiet *al.* (2012).

Economic assessments of poultry genotypes

The economic assessments of poultry genotypes are presented in Table 3. The results of present experiment showed that higher production cost of per bird was recorded in Giriraja (INR.189.21) followed by Vanaraja (INR. 179.76) and RIR (INR.138.25). The total return/bird was maximum recorded for Giriraja (INR.426.96) followed by (INR.398.00), and RIR (INR.105.14). The net profit/bird was higher recorded for Giriraja followed by Vanajara and RIR as INR. 237.75, 218.24 and 105.11, respectively. In term of B:C ratio, Giriraja (1:2.25) bird achieved maximum profit as compared to Vanaraja (1:2.21) and RIR (1:1.76). The results of the present investigation are in agreement with Deka *et al.* (2014) who reported significantly higher benefit cost ratio (BCR) for Vanaraja (3.47) than indigenous chicken (2.42).

The experiment concluded that, Giriraja birds attained maximum body weight gain, feed conversion ratio and benefit cost ratio. Therefore, rearing of Giriraja poultry bird is a good profitable venture. From the results of present investigation, it can be suggested that the rearing of Giriraja poultry birds are more beneficial and efficient than Vanaraja and RIR in Konkan Agro-climatic condition of Maharashtra.

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