



Research Article

Backyard poultry farming for meat and egg production: rural enterprise

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ABSTRACT

Twenty farmers selected from each village for 6 villages of the district and skill based training on various aspects of backyard poultry farming. Participants enriched with sound knowledge were distributed with 25 Vanaraja & Grampriya chicks per person. The records of mean body weight of Grampriya and Vanaraja at different week interval. The body weight of crosses differ significantly ($p < 0.05$) after 4th week of age from their parents. The body weights of crosses were significantly ($p < 0.05$) higher than Hazra (Desi) birds and nearly similar to Vanaraja birds at different period of age attaining the sexual maturity in different groups of poultry birds. Vanaraja matures at the age of 141.62 days, Hazra (Desi) bird at 186.47 days and Grampriya at 158.32 days. The pullet egg weight of Vanaraja, Hazra (Desi) and Grampriya were 38.75, 30.82 and 34.94 g, egg weight at 40 weeks of age were 55.87, 42.89 and 51.26 g and increase in egg weight were 17.12, 12.07 and 15.42 g respectively. The hatchability percentages were 87.56%, 89.36% and 85.72% on fertile egg set and 68.23%, 68.92% and 64.74% on total egg set basis respectively in Vanaraja, Grampriya and local desi birds.

Keywords: Sexual maturity, Vanaraja, Grampriya, Desi and egg weight

INTRODUCTION

Indian agriculture sector contributes 28 per cent to the gross domestic production income (GDP) in India, among which 17% of income from poultry. Today India is the third largest egg and fifth largest in broiler production in the world. The Indian poultry industry growth rate is 8 to 10% for eggs and 15 to 20% for broiler meat production (Shrivastava, A.K., 2011). In India per capita availability of egg and meat are 45 and 2.00 kg respectively against the recommended level of 180 eggs and 9.00 kg of meat by Indian council of medical research (Niranjan *et al.*, 2008). To meet the growing demands of the population and to improve the per capita consumption among the rural / tribal people, All India Coordinated Research Project on poultry breeding at Bihar Veterinary college Patna center, funded by Indian Council of Agricultural Research, New Delhi have developed improved chicken varieties suitable for free range/ backyard farming for rural and schedule areas. The population of land less Jehanabad District, Bihar is predominantly schedule tribal in nature. Non-vegetarian food pattern is huge demand for meat and egg but the production is poor due to rearing of livestock is traditional method. On the basis need, high production potential poultry bird, Vanaraja & Grampriya, has been introduced and popularized as a

sustainable livelihood for rural area. Presently, the backyard poultry farmers (9345) and poultry population (96,262), duck (4619), quail (250) at Jehanabad district (survey, 2012). Growth and production traits of a bird indicate in respect to that of specific environment, genetic constitution and adaptation (Ahmed and Singh 2007).

MATERIALS AND METHODS

Selection of 6 villages in the Jehanabad district and each village 20 farmers were selected on the basis of skill based trained of backyard poultry farming. Participants enriched with sound knowledge were distributed with 25 Vanaraja & Grampriya chicks per person free of cost under front line demonstration mandate of KVK, Jehanabad. Vanaraja & Grampriya chicks for distribution among farming community were procured from Poultry. Division (AICRP), Bihar Veterinary College, Patna, Bihar Agriculture University, Sabour, Bhagalpur. Periodical visits were made to beneficiaries units for health check-up as well as to collect information on growth performance and egg production potential of Vanaraja & Grampriya chicks breed. All chicks were brooded up to three

months of age under deep litter system and thereafter transfer in villages. Chick starter ration along with kitchen waste materials were provided to the chick up to 6 months of age. Subsequently, the grower ration during growing and layer ration during laying periods were provided. The experiment was conducted at Jehanabad which is located between 25° - $25^{\circ}15'$ North latitude to $84^{\circ}30'$ - $85^{\circ}15'$ East longitude. It experiences subtropical climate, characterized by hot summer from March to May and well distributed rain fall during southwest monsoon from June to October.

All the chicks were immunized against Ranikhet disease by using F1 and Lasota strain, Gumboro (IBD) disease vaccine using intermediate strain & other vaccination and deworming schedule were followed by 72 weeks of ages (Chauhan and Roy, 2003). The weekly body weights gain and mortality pattern of chicks were recorded. Relative growth rate of chicks were assessed based on the weekly body weights. The weight of pullet when first egg lay, pullet egg weight, egg weight at 40 weeks of age and increase in egg weight were recorded. Age of laying first egg, number of eggs lay in 40 weeks and in 72 weeks period were recorded. The data was analyzed as per standard statistical methods described by Snedecor and Cochran (1994). The effect of genetic group on the different growth and production trait were studied.

RESULTS AND DISCUSSION

The mean body weight of Grampriya and Vanaraja at different week interval are presented in table 1. The body weight of crosses differ significantly ($p < 0.05$) after 4th week of age from their parents. The body weights of crosses were significantly ($p < 0.05$) higher than Desi birds and nearly similar to Vanaraja birds at different period of age (table 1). Body weight is the direct reflection of growth, production and reproduction trait of birds. In this present study was found most significantly variation in sexual maturity of different groups of poultry birds. Vanaraja matures at the age of 141.62 days, Desi bird at 186.47 days and Grampriya at 158.32 days. The higher body weight gain and early age of sexual maturity in crosses compare to indigenous birds may be because of genetic inheritance of Vanaraja birds prevailing in crosses.

Egg production and egg weights determine the success of poultry enterprise. The pullet egg weight of Vanaraja, Desi and Grampriya were 38.75 g, 30.82 g & 34.94 g, Egg weight at 40 weeks of age were 55.87g, 42.89 g & 51.26 g and increase in egg weight were 17.12g, 12.07g & 15.42 g, respectively. Egg weight at first lay and at 40 weeks of age was significantly ($p < 0.05$) varied in crosses compare to their parents as shown in table 1. The present study was found varied significantly ($p < 0.05$) among them of egg production at 40 weeks and 72 weeks of age. The excelled performance of crosses might be due to the paternal

inheritance from Grampriya birds utilized in developing the crosses. Mortality percentages were found more than that of their parents, in all stage of starter, grower and layer poultry and it was within permissible limit (table 1). Mortality rate was higher in winter, lower in rainy and least during summer season. There was no any specific disease outbreak recorded during the experimental period in the farm. The cross has substantial production capabilities as dual purpose bird suitable for rural and backyard farming in India. Therefore, it is concluded that the cross bred poultry is better than that of rural poultry varieties for suitable of alternative dual purpose variety for backyard poultry farming.

The hatchability percentages were 87.56%, 89.36% and 85.72% on fertile egg set and 68.23%, 68.92% and 64.74% on total egg set basis respectively in Vanaraja, Grampriya and local birds. The mean percent hatchability observed in this study on fertile egg set and total egg set basis was higher than the values observed by Pandian *et al.*, (2011) (85.99% and 64.48%) in bantam chicken. The body's weight of F1 cross was higher than that of indigenous poultry during week interval. The excelled performance of crosses might be due to the paternal inheritance from Vanaraja utilized in developing the crosses. Body weight is the direct reflection for growth, production and reproduction trait of birds (Nirajan *et al.*, 2008). The significant effects of genetic group on body weight of chicken were reported by many workers (Mohammed *et al.*, 2005, Chatterjee *et al.*, 2007) similar to the present study. The comparable estimates were reports by (Haunshi *et al.*, 2009) and Niranjan *et al.*, (2008) in Gramapriya birds. The present study were in agreement with earlier report of Jha *et al.*, (2012), who reported similar type of growth pattern performance of Desi birds. The lower body weight of local Desi birds was on expected line since indigenous chicken are known to have lighter and compact body weight to escape from the rearing of free range system (Haunshi *et al.*, 2009).

Average age at sexual maturity (ASM) in our finding was 141.62, 186.47 and 158.32 days respectively in Vanaraja, Grampriya and Desi birds. The lower age at sexual maturity in the layer is desirable, which may lead to the increase laying period and improving the egg production. Previously, Haunshi *et al.* (2009) reported that there was comparatively higher age of sexual maturity in improved varieties Gramapriya (179.50 days) and Vanaraja birds (197.70 days), which developed for backyard farming. In backyard farming reported by Niranjan *et al.* (2008) at 160.89 and 164.79 days attaining sexual maturity of Gramapriya and Vanaraja birds, Whereas comparatively lower age of first lay for Gramapriya birds in intensive (138 days) and extensive (142 days) system of management recorded by Giri and Sahoo (2012).

Table 1: Growth and performance of Vanaraja, Grampriya and Hazra (Desi) of different ages

Age of chicks		Vanaraja (g)	Grampriya (g)	Hazra (Desi)(g)
0 Day		34.28±0.32 ^b	33.61±0.26 ^{ab}	30.57±0.23 ^a
4 Weeks		146.72±2.14 ^b	139.34±2.23 ^{ab}	124.85±1.27 ^a
6 Weeks		371.46±1.38 ^b	348.38±1.58 ^b	196.81±2.51 ^a
8 Weeks		498.56±1.82 ^b	478.93±2.42 ^b	276.78±3.24 ^a
12 Weeks		815.76±3.34 ^b	794.36±4.25 ^b	523.25±4.73 ^a
16 Weeks		1236.41±2.95 ^b	1156.24±3.92 ^b	651.36±5.12 ^a
20 Weeks		1572.31±1.87 ^b	1464.52±2.75 ^b	986.74±5.85 ^a
40 Weeks		1835.52±4.65 ^b	1682.28±4.73 ^b	1259.84±6.23 ^a
Age at Sexual maturity (Days)		143.65±1.76 ^c	171.38±1.42 ^b	212.43±1.65 ^a
Egg weight at 40 weeks of age		55.87±2.24 ^b	51.26±2.35 ^{ab}	42.89±2.37 ^a
Increase in egg weight (g)		17.12	16.32	12.05
No. of eggs laid in 40 weeks period		72.57 ± 3.46 ^c	58.26 ± 3.58 ^b	11.83 ± 3.72 ^a
No. of eggs laid in 72 weeks period		214.52 ± 3.95 ^c	167.48 ± 4.71 ^b	61.83 ± 4.83 ^a
Egg shell color		Dark brown	Brown to light brown	Creamy
Mortality (%)	Starter (0-8 week)	7.54	8.63	6.85
	Grower (9-20 week)	2.61	3.57	2.78
	Layer (21-72 week)	0.95	1.27	0.46
Means bearing same superscript within rows (small letters) did not differ significantly (P < 0.05)				

The present study was recorded total eggs produced for crosses birds at 40 weeks and 72 weeks period higher in respect of Niranjana *et al.* (2008), who reported 56.15 and 149.47 eggs respectively in Vanaraja birds. In intensive system production of eggs 93.25 eggs and 78.0 eggs in Gramapriya birds reported by Giri and Sahoo (2012). The value of egg quality obtained in these study were compared to that of Arya *et al.*, (2012) in desi and exotic crosses during backyard farming and in colored broiler sire line under agro climatic condition of Tripura reported by Malik and Singh, (2011).

The overall mortality of all the three group of birds was recorded as shown in table 1. Mortality was mainly found due to bacterial and infection of yolk sac (coryza & colibacillosis) and protozoal (coccidiosis). There was no outbreak or death due to specific diseases was observed during the course of study. These finding were better than the earlier report of Jha *et al.* (2012) who reported 23.12 % mortality in Desi birds under intensive management system. Giri and Sahoo (2012) reported 9.65 % and 24.66 % mortality upto 8 weeks of age in Gramapriya birds under intensive and extensive system of management respectively. Over 50 Farmers adopted the Enterprise, five progressive farmers Mr. Manoj kumar, Mr. Kundan Kumar, Minazul Haq, Nakul kumar and Arbind Kumar respectively from Deora, Nonhi, kako, Jehanabad and Rukunpura villages initially started this enterprise on commercial scale. They could produce 96,500 boilers birds and distributed among these 9345 fellow farmers. Fifty farmers are less practicing for capital intensive, economic returns and livelihood oriented enterprise in the district. Successful

farmers have produced about 60,000 boilers birds and they also started of local birds i.e. Vanaraja & Gramapriya chicks for eggs production because of easy accessibility of eggs at doorsteps & also start the enterprise. Back yard poultry farming great opportunities of employment generated and commercial farming for rural youth population at village levels. The venture has successfully generated average income from eggs and meat due to desi non -descript bird upgraded by crossbreeding of improved breed. Results concluded that the Vanaraja & Gramapriya as compared to Desi birds are characterized by faster growth, more number of bigger sized eggs, thrives well under low input system, resistance to most of the diseases, and requires small space, minimum labour force and investment and aid to self-employment and income generation.

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