

## Original Research Article

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## Comparative Performance of Vanaraja, Gramapriya and Indigenous Desi Bird under Backyard System of Rearing in Jammu Province, India

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### ABSTRACT

The J&K is hilly state with rural and tribal masses keeping poultry as a tradition for their livelihood since time immemorial. They rear desi chicken with low egg and meat production in backyard system. For developing the rural poultry farming, improved backyard poultry birds rearing is of very important. The present study has been undertaken to evaluate production efficiency of three types of chicken varieties (Vanaraja, Gramapriya and local birds 100 each). Upto 60 weeks of age from September (2013-2016) at SKUAST-J. The improved varieties had significantly ( $P \leq 0.01$ ) higher body weight than the local chicken. Age of first egg was lower ( $P \leq 0.05$ ) in Gramapriya (173.00±1.35 day) as compared to Vanaraja (181.53±1.29 days) and desi birds (179.87±1.48 days). Gramapriya were considerably ( $P \leq 0.05$ ) more consistent layer among three, while Vanaraja was better ( $P \leq 0.05$ ) than local. Overall 65% hatchability was recorded. During the study period 14.5, 11.7 and 21.2 per cent mortality were recorded in Gramapriya, Vanaraja and local birds respectively. The backyard poultry system with improved birds provide a solution to food security to the rural masses paving a way for sustainable livestock production in India.

#### Keywords

Vanaraja, Gramapriya, backyard system, Egg production, Body weight, Hatchability, Mortality

#### Article Info

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### Introduction

Poultry farming is one of the fastest growing segments of agriculture in India. It carries a pivotal position in current Indian economy and has evolved as an extremely business oriented enterprise Sreenivas *et al.*, (2013). Improvement in poultry performance started from 1950s together with selection of genetically superior birds and improvement in ambient factors such as feeding and housing, which resulted in decrease slaughtering age to 42 days and increase body weight to 2 kg

Havenstien *et al.*, (1994) High environmental temperatures during summer months significantly reduce feed intake and causes slower growth rates of poultry Bonnet *et al.*, (1997). Heat stress depresses body weight and is generally accompanied by suppression of feed intake leading to decline in production. *Vanaraja* is an example of superior stock (developed by the Project Directorate on Poultry, ICAR, Hyderabad for backyard farming in rural and tribal areas of India) a choice dual purpose coloured bird which have significantly contributed to the overall

economy of the rural people in terms of eggs and meat (Bhattacharya *et al.*, 2005). Gramapriya a layer type variety developed for free range farming in rural and tribal areas. Peoples of Jammu province are mostly rural and tribal masses have been keeping poultry by tradition for their livelihood and nutritional security since the time of immemorial. Majority of the farmers are still keeping 10-15 numbers of low input indigenous fowls at their backyard for both egg and meat production to meet their day to day petty expenses and nutritional security. However, the productivity of native indigenous fowls is very low due to their inherent low genetic potential. Vanaraja, a dual type high yielding chicken developed by Project Directorate on Poultry, Hyderabad and successfully introduced in various parts of our country is giving promising productive and reproductive performance under backyard system of management. However, information on systemic studies on the productive and reproductive performance of Vanaraja and Gramapriya birds under backyard system in Jammu province is very scanty. Keeping in view, the present study has been undertaken to assess various economic traits of Vanaraja and Gramapriya birds under extensive system of rearing in Jammu province.

### **Materials and Methods**

The present study has been undertaken at Research Farm, Farming System Research Centre, SKUAST- J to evaluate production efficiency of three types of chickens varieties (Vanaraja, Gramapriya and local birds 100 each) upto 60 weeks of age during September (2013-2016). In the backyard system the birds were reared under extensive as well as semi intensive care. The birds were kept in locally made house of available material for night stay. There were lots of similarities in feeding habits of all these birds like forage and scratch feed from vast backyard with green leafy vegetables, insects and grains of grass.

Sometimes the birds were offered with chopped kitchen waste, and other household vegetable waste. These birds were fed with these feeds both morning and evening. Except offering some feed material, no extra care was given to them. The birds were vaccinated against Ranikhet and Gumboro diseases by following standard vaccination method. Age of the birds at first egg stage was recorded. Observations were also recorded for other parameters viz. total egg production, first egg weight and shank length (mm) of adult male and female birds. Performance of these birds was evaluated using various tests. Means and standard errors of various traits were calculated using standard statistical procedures (Snedecor and Cochran, 1989).

### **Results and Discussion**

Both the improved varieties had significantly ( $P \leq 0.01$ ) higher body weight (Table 1) than local chicken. Among improved varieties Vanaraja were heavier ( $P \leq 0.05$ ). Age of first egg (Table 2) was significantly lower ( $P \leq 0.05$ ) in Gramapriya ( $173.00 \pm 1.35$  days) in comparison to Vanaraja ( $181.53 \pm 1.29$  days) and desi birds ( $179.87 \pm 1.48$  days). Kalita *et al.*, (2012) also reported almost similar body weight of indigenous chicken at 40 weeks of age all previous studies have reported that Vanaraja was heavier than Gramapriya Haunshi *et al.*, (2009). All the backyard Vanaraja got better body weight than other two varieties and thus proved its better genetic potential to convert available feed into quality animal protein. Gramapriya is predominantly an egg producing variety developed at project Directorate on poultry, Hyderabad and thus lower age of sexual maturity was justifiable. Kumar *et al.*, (2005) reported that age at sexual maturity was 171 days for Vanaraja chicken while Bhattacharya *et al.*, (2005) reported that the age at sexual maturity and average egg size of Vanaraja chicken ranged from 172 to 185 days and between 46 and 55 g

respectively. In present study compared to Gramapriya relatively higher age of first egg was observed in Vanaraja when compared to Gramapriya the relatively lower body weights and higher age at sexual maturity of improved varieties observed in studies may be due to climatic conditions of Jammu province.

The study revealed that the Gramapriya was considerably ( $P \leq 0.05$ ) more consistent in laying compared to other to groups, while Vanaraja was better ( $P \leq 0.05$ ) than local. The present result on total egg production was much lower than the reports of (Malik and Singh, 2009) who found 62.55 and 30.13 numbers of total egg production at 40 weeks of age in Gramapriya and Vanaraja, respectively at farm at ICAR Tripura centre. In contrast to the present findings, Niranjana *et al.*, (2008) and Ramana *et al.*, (2010) recorded higher body weight of Vanaraja birds at

different ages under intensive system of management. The higher body weight in intensive system might be due to the supplementation of balanced diet and other proper managemental care. According to survey data 30 to 35% eggs were sold, 40-45% were consumed and rest were set for hatching by local broody hen. Overall 60% hatchability was recorded. During the study period 14.5, 11.7 and 21.2 per cent mortality were recorded in Gramapriya, Vanaraja and local birds respectively (Fig. 1).

The average weight of first egg and egg weight at 40 and 60 weeks of age were significantly low in local birds. Shank length in female birds for all three groups were statistically similar but significantly higher ( $P \leq 0.05$ ) shank length was recorded in male birds of Gramapriya followed by Vanaraja and local birds.

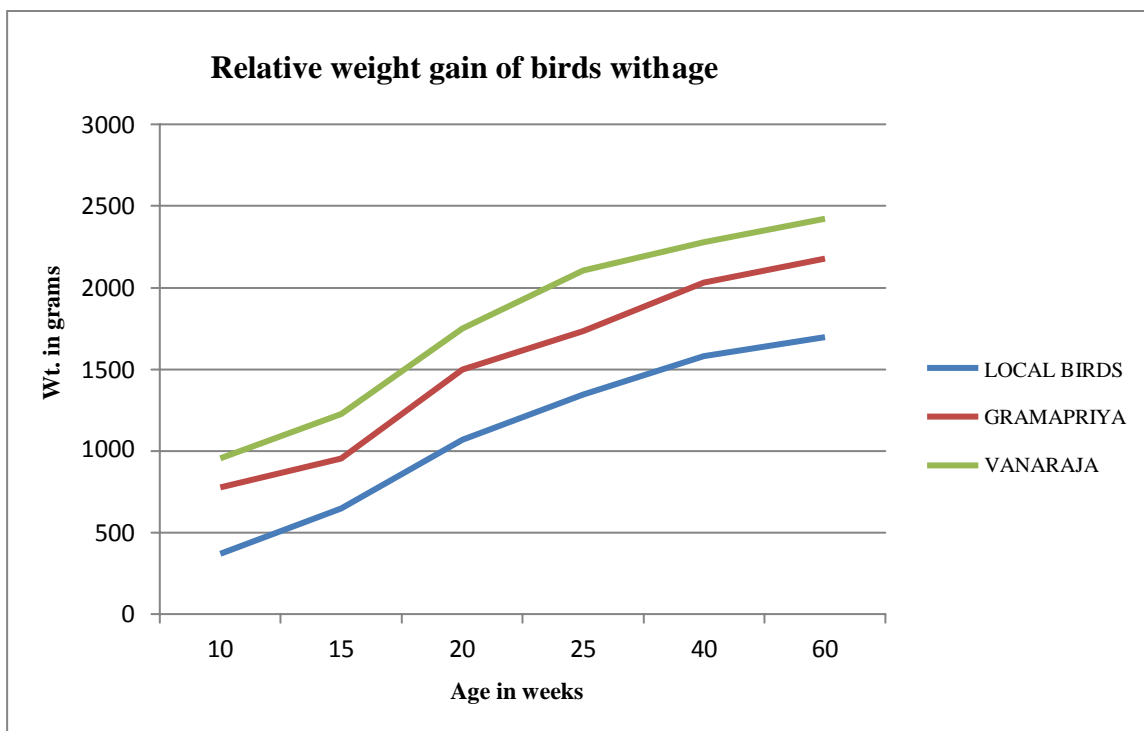
**Table.1** Mean body weight (g) of birds at different age (wks) of birds

Age in weeks	Local\desi breeds (n 100)	Gramapriya (n)	Vanaraja (n 100)
10	370.00±0.31	776.75± 6.33	954.50 ±10.23
15	646.50±9.52	954.50 ±10.23	1227.00± 14.82
20	1068.00±25.64	1499.50± 21.55	1748.50± 31.92
25	1347.00±14.46	1734.50± 23.00	2107.00± 30.52
40	1579.50±19.59	2031.75± 26.14	2280.00 ±35.06
60	1697.50±28.21	2177.50 ±30.67	2422.50± 30.24

**Table.2** Average age of first egg, total egg production, first egg weight and shank length (mm) of adult male and female birds

Parameters	Local birds	Gramapriya	Vanaraja
Age of first egg(d)	179.87± 1.48	173.00± 1.35	181.53± 1.29
Total eggs upto 40 weeks of age(No.)	15.33± 0.54	30.40 ±1.06	22.20± 0.88
Total eggs upto 60 weeks of age(No.)	63.27 ±1.60	100.87± 2.51	77.60± 1.74
First egg weight(g)	36.87 ±0.70	42.47 ±0.97	43.07 ±0.75
Egg wt at 40 wks of age(g)	47.47± 0.62	52.27± 0.57	51.80±0.44
Egg wt at 60 wks of age (g)	49.67± 0.64	53.07± 0.55	53.53±0.48
Shank length (mm) of adult male	86.56±0.95	91.50± 0.65	88.81± 0.64
Shank length (mm) of adult female	73.69± 0.79	75.75±0.72	77.06±0.84

**Fig.1** Relative weight gain with age of the birds



The performance of Vanaraja and Gramapriya was much better in comparison to desi birds in rural-hilly areas. The birds had adaptability in the local climatic conditions of Jammu province.

It can be concluded that performance of Vanaraja and Gramapriya in terms of age at first egg laying, egg production and body weight was much better in comparison to desi birds under backyard system of poultry rearing in Jammu Province. So, farmers from rural and tribal areas of Jammu Province can rear Vanaraja and Gramapriya birds for their livelihood and nutritional security.

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