

Original Research Article

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Comparative Performances of Improved Poultry Breeds under Intensive Condition in Murshidabad District of West Bengal, India

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ABSTRACT

The study was conducted to compare the production performance of Gramariya, Vanaraja, Haringhata Black and Rhode Island Red chickens in intensive condition. The study was undertaken in Murshidabad Krishi Vigyan Kendra of West Bengal state with respect to live body weight in different age, age at sexual maturity, average weight at first egg, average egg production up to 72 weeks of age and average egg weight at 40 weeks. The average body weight at onset of laying of Vanaraja birds was 1747.8 g which was highest than other breeds. Average age at sexual maturity were 187, 195, 173 and 181 days in Gramapriya Vanaraja, Haringhata Black and Rhode Island Red breeds respectively. The average weight at first egg was highest (51.2 g) in Vanaraja but lowest (41.4 g) in Haringhata Black chicken whereas average weight of egg at 40 wks was highest (55.2 g) in Gramapriya but lowest (47.6 g) in Haringhata Black chicken. The egg production up to 72 wks of age was 153 nos in Gramapriya and 140, 136 and 129 nos in Vanaraja, Rhode Island Red and Haringhata Black birds respectively. Moreover, Gramapriya was genetically superior to Vanaraja, Rhode Island Red and Haringhata Black in terms of productive and reproductive parameters.

Keywords

Gramapriya, Body weight, Egg Production, Intensive System, Murshidabad

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Introduction

Livestock and poultry sector provide a major contribution to India's economy (Nath *et al.*, 2012). Backyard poultry production in India is characterized by small scavenging operations. For generations, farmers of India have practiced this type of rearing and most of the poultry in the villages are indigenous birds, considered to be very poor layers (annual egg

production: 50-60 nos.). The native chicken varieties adopted in free-range backyard conditions for centuries contribute about 11% of total egg production in India (Kumaresan *et al.*, 2008). Therefore, to increase the productivity of backyard poultry farming, the improved varieties which are lookalike indigenous chickens are now being massively introduced in the region (Singh *et al.*, 2002). Gramapriya and Vanaraja are dual purpose

breeds developed at Project Directorate on Poultry for backyard poultry production in rural and tribal areas (Reddy *et al.*, 2002). Haringhata Black chicken (native breeds of West Bengal) is indigenous to India and they have black Plumage, disease resistance and well adaptability to local environment (Vij *et al.*, 2015). Due to interventions of many Govt./Non-Govt. institutes for last couple of decades, local farmers of the district adopted Rhode Island Red (RIR) birds as a better alternative to Desi (Non-Descript) poultry birds. However, production potential of RIR breed seems to be capped in low input farming system (Dumrya 2015). The purpose of this study was to compare and evaluate the productive and reproductive performance, as well as body weight in different age, age at sexual maturity and egg production of Gramariya, Vanaraja, Haringhata Black and Rhode Island Red breeds under intensive management system of rearing in Murshidabad.

Materials and Methods

Study Area

The present experiment was conducted at Demonstration Unit of Murshidabad Krishi Vigyan Kendra (KVK) under West Bengal University of Animal and Fishery Sciences, Kolkata, during October, 2015 to April, 2017 to investigate the poultry body weights, age at sexual maturity and production traits of Gramariya, Vanaraja, Haringhata Black and Rhode Island Red (RIR) under intensive condition.

Experiment Design

Under the intensive system of rearing one hundred and twenty pullets were housed in deep litter system with three replications of ten birds from each breed. Chicks were obtained from Government/private farms, reared in brooding shed of KVK up to 3 weeks

of age. All the birds received a standard pullet rearing ration up to 21 weeks of age and thereafter a standard layer diet (Table 1) containing 17.3% crude protein (CP) and 10.6 MJ ME/kg. Layer birds (after 21 weeks) fed with restricted diet at the rate of 120 g per adult bird per day and water were supplied adlibitum. Routine deworming and vaccination schedule were followed in flocks as per standard protocol. Data on egg production, egg weight and feed consumption were collected till the layers were 72 weeks old. All the data were summarized by 28 day intervals and submitted to analysis of variance (Steel and Torrie 1960).

Results and Discussion

Live body weight in different age, age at sexual maturity, average weight at first egg, average egg productions up to 72 weeks of age and average egg weight at 40 weeks of four breeds were presented in the Table 2. It clearly indicated that Vanaraja poultry breed (Fig.1) was the fastest growing breed and it achieved higher body weight (1747.8 g) at maturity followed by Gamapriya (1659.6 g), Rhode Island Red (RIR) (1320.2 g) and Haringhata Black (1133.0 g) breeds. Hens from Haringhata Black breed showed slowest growth that is common in indigenous lines. Hassen *et al.*, (2006) and Alam *et al.*, (2014) reported similar slow growth pattern of adult non-descript local hens in Ethiopia and Bangladesh respectively. Thakur *et al.*, (2006) suggested that famous Kadaknath breed reared under tribal villages in central India exhibited similar growth pattern like Haringhata Black breed. Adult body weight of RIR breed was also in agreement with Hassen *et al.*, (2006). In the present study, adult body weight of Vanaraja breed was recorded lower as compared to earlier reports (Pathak and Nath 2013) that stated its average adult body weight was 2300 gm. This variation might be attributed to different management practices adopted and local climatic variations.

Table.1 Composition of experimental diet

S. No.	Ingredient	%
1	Grind Yellow Wheat	49.65
2	Grind Mustard oil cake	11.00
3	Fish Meal (53% protein)	9.00
4	Rice Polish	22.25
5	Oyster Shell	7.50
6	Mineral - Vitamin Premix*	0.30
7	Table Salt	0.30

* The commercial mineral vitamin Premix (Supplevite-M) supplied per kg of diet: Vitamin A, 500000 IU; Vit. D3, 100000 IU; Vitamin B2, 0.2 g; Vitamin E, 75 Units; Vitamin K, 0.1 g; Cal. Pantothenate, 0.25 g; Nicotinamide, 1 g; Vitamin B12, 0.6 mg; Choline Chloride, 15 g. Mineral element: calcium, 75 mg; manganese, 2.75 g; iodine, 0.1 g; iron, 0.75 g; zinc, 1.5 g; copper, 0.2 g; cobalt, 0.045 g.

Table.2 Comparative performances of different breeds of poultry

Performances	Gramapriya	Vanaraja	Haringhata Black	Rhode Island Red
Body Weight (g)				
a. At Hatch	37.2	41.0	31.6	33.4
b. 8 week	341.8	369.4	293.4	325.2
c. 16 week	1101.4	1152.4	679.8	989.2
d. At the Onset of Laying	1659.6	1747.8	1133.0	1320.2
Average age at sexual maturity (days)	187	195	173	181
Average weight of first egg (g)	49.8	51.2	41.4	45.4
Average egg production up to 72 weeks (Nos.)	153	140	129	136
Average egg weight at 40 weeks (g)	55.2	53.6	47.6	53.8

Fig.1 Body weight of Vanaraja poultry



Haringhata Black was the fastest (173 days) to reach sexual maturity among four breeds and that was found to be similar to that of local non-descript hens of Bangladesh as reported by Alam *et al.*, (2014). The differences in attaining sexual maturity might be due to the genetic differences among the four groups of birds. Sexual maturity tends to be attained at later ages for heavier breeds. This character is also influenced by many environmental factors, such as temperature, nutrition and day length.

The average weight of first egg were 49.8 g, 51.2 g, 41.4 g and 45.4 g but average egg weight at 40 weeks were 55.2 g, 53.6 g, 47.6 g and 53.8 g in case of Gramapriya, Vanaraja, Haringhata Black and Rhode Island Red respectively. In general the egg weights in both the period (first egg & at 40 weeks) were significantly higher in Gramapriya and Vanaraja with better egg weights in compare to Haringhata Black and Rhode Island Red during the entire laying period. However, the egg weights in Haringhata Black are significantly lower than the other 3 breeds. Sharma and Hazary (2002) reported 42-44 g (40 weeks) of egg weight in Vanaraja and an average egg weight of 53.55 g in Gramapriya, which were lower than the present estimates. The higher production in Gramapriya may be because of the parental lines utilized in developing breeds.

Egg production and egg weights determine the success of the poultry enterprise. In intensive system the highest egg production (up to 72 weeks) was obtained by Gramapriya with 153 nos followed by Vanaraja (140 nos), Rhode Island Red (136 nos) and Haringhata Black (129 nos). Each genotype showed distinct egg production performance. All the four breeds produced eggs in one or two clutches. Egg production performance of RIR was in agreement with earlier workers (Hassen *et al.*, 2006; Taj *et al.*, 2014). It is

clear from the data that Gramapriya followed by Vanaraj are the most suitable for rearing even in restricted or low feed input farming.

It may be concluded that Gramapriya is genetically superior to Vanaraja, Rhode Island Red and Haringhata Black in terms of above reproductive parameters like age at sexual maturity and productive parameters like egg production, egg weight, hatch weight and body weight. In the intensive system of rearing the highest performance was obtained with Gramapriya, which is considered to be well adapted to the climatic conditions of Murshidabad district. Government and Non-Government organizations must initiate for large scale propagation of this Gramapriya breed for achieving better livelihood in the concerned region.

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