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EVALUATION OF DAHLEM RED AND HAZRA CROSSES CHICKEN REARED UNDER INTENSIVE SYSTEM OF MANAGEMENT

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ABSTRACT

A study was conducted to evaluate the production performance of crosses of Dahlem Red and local Hazra birds under intensive system of management. All chicks were brooded up to two months of age under deep litter system and thereafter transfer in cages and reared under similar management and environment for 72 weeks. There is significant variation in growth rate, age at sexual maturity, egg production, egg weight and mortality pattern of crosses compare to their parent birds. The crosses showed significantly ($P<0.05$) higher body weight, higher feed intake, better egg production rate, large egg size, higher egg weight and early sexual maturity than local Hazra birds under same system of management.

Key Words: Dahlem Red, Hazra, cross bird, performance, egg and mortality.

The Indian poultry industry is growing at the rate of 8 to 10% for eggs and 15 to 20% for broiler production[12]. 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[10]. 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 Ranchi centre, funded by Indian Council of Agricultural Research, New Delhi has developed improved chicken varieties suitable for free range/ backyard farming for rural and tribal areas. A crossbreeding experiment was undertaken by using Dahlem Red and indigenous chickens of Jharkhand to determine production performance of laying hens at various ages. The products of the crossings (F1) showed improved performances to those of their local chicken. Growth and production traits of a bird indicate its genetic constitution and adaptation with respect to the specific environment[1].

MATERIALS AND METHODS

The growth and production performance of 112 birds each of Dahlem Red, local Hazra birds of Jharkhand and their crosses were recorded. Dahlem Red is an improved exotic layer type birds, extensively used to improve local birds in developing country. The crosses were produced by artificial insemination with pooled semen of Dahlem Red male birds and local Hazra female birds.

All chicks were brooded up to two months of age under deep litter system and thereafter transfer in cages for 72 weeks. Chick starter ration were provided to the chick upto 8 weeks of age. Subsequently, the grower ration during growing and

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layer ration during laying periods were provided. The experiment was conducted at Ranchi which is located between 22^0 45'- $23^0$45' North latitude to 84^0 45'-84^0 50' 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 on 7th and 28th days respectively. Gumboro (IBD) disease vaccine was done on 13th and 24th days by using intermediate strain. Other vaccination and deworming schedule were followed upto 72 weeks of age as per method[4]. 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 effect of genetic group on the different growth and production trait were studied. The qualities of eggs were also studies and all the data were analyzed as per standard statistical methods[13].

RESULTS AND DISCUSSION

The mean body weight of Dahlem Red, Hazra and their crosses 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 Hazra birds and nearly similar to Dahlem Red birds at different period of age (table 1). There was significant variation in attaining the sexual maturity in different groups of poultry birds in present study. Dahlem Red matures at the age of 141.62 days, Hazra bird at 186.47 days and their crosses 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 Dahlem Red birds prevailing in crosses.

Egg production and egg weights determine the success of poultry enterprise. The pullet egg weight of Dahlem Red, Hazra and their crosses were 39.78, 36.75 and 37.92 g, egg weight at 40 weeks of age were 55.87, 49.86 and 54.21 g and increase in egg weight were 18.04, 13.11 and 16.29 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 egg production at 40 weeks and at 72 weeks of age was investigated in the present study and it varied significantly ($p < 0.05$) among them. The excelled performance of crosses might be due to the paternal inheritance from Dahlem Red birds utilized in developing the crosses. Mortality percentages in crosses were more than their parents in all starter, grower and layer stages 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 hatchability percentages were 89.52%, 91.35% and 85.76% on fertile egg set and 72.26%, 75.93% and 68.79% on total egg set basis respectively in Dahlem Red, Crosses 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 earlier workers[11] (85.99% and 64.48%) in bantam chicken.

The body weight of F1 cross was higher than the indigenous birds used in breeding at respective week interval. The excelled performance of crosses might be due to the paternal inheritance from Dahlem Red utilized in developing the crosses. Body weight is the direct reflection of growth and it influences the production and reproduction trait of birds[10]. The significant effects of genetic group on body weight of chicken were reported by many workers[3, 9] similar to the present study. The present estimates were comparable to the reports [6, 10] of in Gramapriya birds. The performance of Hazra birds in present study were in agreement with earlier report[7], who reported similar type of growth pattern for these birds. The long shank and compact body of Hazra birds was on expected line since indigenous chicken are known to escape from the predators in free range system of rearing[6].

Average age at sexual maturity (ASM) in present finding was 141.62, 182.47 and 158.32 days respectively in Dahlem Red, Hazra and their crosses. 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, 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[6]. There were respectively 160.89 and 164.79 days required in attaining sexual maturity for Gramapriya and Vanaraja birds in backyard farming[10]. There was comparatively lower age of first lay for Gramapriya birds in intensive (138 days) and extensive (142 days) system of management[5].

Pullet egg weight, egg weight at 40 weeks of age and total number of egg lay in 40 weeks and 72 weeks were higher in Dahlem Red than Hazra and their crosses as shown in table 1. The pullet eggs weight, egg weight at 40 weeks of age and increase in egg weight of local birds of Jharkhand is better than indigenous Miri type birds of northeastern region of India[6]. The total eggs produced for crosses at 40 weeks and 72 weeks period in present study was higher than the report of[10], who reported 56.15 and 149.47 eggs respectively for Vanaraja birds. There were 93.25 eggs in intensive system and 78.0 eggs in extensive system of management in Gramapriya birds[5]. The quality of eggs obtained in these study were comparable to desi and exotic crosses under backyard farming[2] and to coloured broiler sire line under agro climatic condition of Tripura[8].

The overall mortality of all the three group of birds was recorded as shown in table 1. Mortality in the present study was mainly due to yolk sac infection, coryza, colibacillosis and 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[7], who reported 7.28 % mortality in Hazra birds under intensive management system. There was 9.65 % and 24.66 % mortality upto 8 weeks of age in Gramapriya birds under intensive and extensive system of management respectively[5].

Table 1: Performance of Dahlem Red, Hazra and their crosses of different age groups.

Age of chicks		Dahlem Red	Dahlem Red X Hazra	Hazra
0 Day (g)		34.28±0.32 ^{b}	33.61±0.26 ^{ab}	31.34±0.23 ^{a}
4 Weeks (g)		148.72±2.14 ^{b}	139.34±2.23 ^{ab}	134.85±1.27 ^{a}
6 Weeks (g)		371.46±1.38 ^{b}	348.38±1.58 ^{b}	264.81±2.51 ^{a}
8 Weeks (g)		498.56±1.82 ^{b}	478.93±2.42 ^{b}	376.78±3.24 ^{a}
12 Weeks (g)		815.76±3.34 ^{b}	794.36±4.25 ^{b}	593.25±4.73 ^{a}
16 Weeks (g)		1236.41±2.95 ^{b}	1156.24±3.92 ^{b}	981.36±5.12 ^{a}
20 Weeks (g)		1572.31±1.87 ^{b}	1464.52±2.75 ^{b}	1256.74±5.85 ^{a}
40 Weeks (g)		1838.52±4.65 ^{b}	1765.28±4.73 ^{b}	1392.84±6.23 ^{a}
Age at Sexual maturity (Days)		141.62±1.76 ^{c}	158.32±1.42 ^{b}	182.47±1.68 ^{a}
Pullet egg weight		39.78±0.23 ^{b}	37.92±0.35 ^{ab}	36.75±0.54 ^{a}
Egg weight at 40 weeks of age		57.82±2.24 ^{b}	54.21±2.32 ^{ab}	49.86±2.37 ^{a}
Increase in egg weight (g)		18.04	16.29	13.11
No. of eggs laid in 40 weeks period		74.58 ± 3.12 ^{c}	58.62 ± 3.54 ^{b}	18.73 ± 3.76 ^{a}
No. of eggs laid in 72 weeks period		221.36 ± 3.95 ^{c}	187.42 ± 4.51 ^{b}	71.38 ± 4.23 ^{a}
Egg shell color		Dark brown	Brown to light brown	Creamy
Mortality (%)	Starter (0-8 week)	7.24	8.16	5.28
	Grower (9-20 week)	2.38	3.25	1 .32
	Layer (21-72 week)	0.85	1.23	0.47

Means bearing same superscript within rows did not differ significantly (P < 0.05).

CONCLUSION

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 is better than the proven rural varieties and can be a suitable alternative dual purpose variety for backyard farming.

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