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Comparative performances of *Kuroiler, Raibow Rooster and Indigenous* birds under backyard system of rearing in Dhubri district of Assam

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Abstract

A study was conducted to assess various productive and reproductive performances of Kuroiler, Rainbow Rooster *and* Indigenous *chicken under backyard system of rearing. Information were collected in order to study various traits like body weight, age at first egg, weekly hen day, annual egg production and survivability at different ages etc. to evaluate the birds under backyard system. The mean body weights, egg production and egg weights were significantly higher in improved varieties (*Kuroiler *and* Rainbow Rooster*) than* Indigenous *variety at different ages. The* Indigenous *chicken matured late than either of* Kuroiler *and* Rainbow Rooster. *The percent mortality was significantly (Pd 0.05) lower in* Indigenous *chicken while compared to the improved genotypes in different ages. The mortality rates were decreased with the advancement of age of the birds in all three cases. The numerical values for percent hatchability on TES and FES were recorded lower in case of* Kuroiler *(84.23) and* Indigenous *(95.06) chicken eggs respectively. Thus, it can be concluded that* Kuroiler and Rainbow Rooster *birds can be reared suitably for both meat and egg production in small scale under backyard system for rural livelihood and nutritional security.*

Key words: *Kuroiler, Rainbow Rooster, Indigenous*, body weight, age at first egg, annual egg production, mortality.

Introduction

Rearing of backyard poultry has been a tradition among tribal and rural resource poor family in Assam. Mostly women and children are involved in backyard poultry keeping with a small flock of chicken of 10 to 15 numbers. The demand for local chicken meat and eggs is always higher due to their unique taste. The consumers also pay a premium price for them. However, the productive and reproductive performance of local chicken is inferior due to inherent lower genetic potential. In the recent past, improved backyard varieties (like Vanaraja, Gramapriya, Srinidhi, Giriraja etc.) developed mostly by public sector and a few by private sector (like Kroiler, *Rainbow Rooster*) are substantially contributing to the total chicken egg and meat production of the country (Chatterjee and Rajkumar, 2015). The *Kuroiler* and *Rainbow Rooster* chicken were developed by private farms which are improved dual type multicoloured backyard chicken, capable of producing more eggs and meat than the *Indigenous* chicken under backyard system. However, information on productive and reproductive performance of *Kuroiler* and *Rainbow Rooster* birds are very scanty. Hence the present study was undertaken to know the performance of these chickens under field condition with following objectives:

1. To know the body weights at various ages
2. To know the age at first egg, egg production, egg weight etc.
3. To study the mortality rate
4. To study fertility and hatchability

Materials and Methods

The study was carried out during the period of December, 2015 to December, 2016 in the Bilasipara Sub-division of Dhubri district of Assam. For this study a total of one hundred numbers of small scale traditional

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poultry farmers were selected randomly from each of the ten villages. Each farmer was supplied with ten numbers of *Kuroiler* and ten numbers of *Rainbow Rooster* day old chicks. The farmers were selected on the basis of their experience in keeping *Indigenous* chicken and who kept a minimum of 10-15 numbers of *Indigenous* chicken under free range system. Both *Kuroiler* and *Rainbow Rooster* chicks were brooded under the bamboo cage fitted with electric bulbs (like Hover brooder) up to 21-25 days of age. During brooding, the chicks were provided with *ad libitum* broiler pre-starter crumbs and clean potable drinking water. The chicks were also vaccinated against Ranikhet and Gumboro diseases as per standard vaccination schedule. After proper brooding, the chicks were let loose during day time with supplemental feeding for 3-4 days until they were able to feed through natural feed resources.

The data on body weights at 8, 20, 40 and 52 weeks of age, age at first egg, egg weights at 32, 40 and 52 weeks of age, egg production up to 32, 40 and 52 weeks of age were recorded. Mortality rate was recorded at 0 to 5, 6 to 30 and 31 to 52 weeks of age.

For study of fertility and hatchability, a total of 500 numbers of eggs, 250 numbers from each variety of *Kuroiler* and *Rainbow Rooster* were collected within a period of one week from different stocks and were set under *Indigenous* broody hens. The fertility was tested on 7-10th day of setting with the help of electric bulb and infertile eggs were removed. The percent hatchability on TES and FES was calculated after 21 days of incubation period. The data collected on various traits were subjected to standard statistical analysis (Snedecor and Cochran, 1994).

Results and Discussion

The mean body weights showed no significant (Pd"0.05) difference between *Kuroiler* and *Rainbow Rooster* chicken at different ages, although the numerical values were higher in *Kuroiler* than the *Rainbow Rooster* chicken at different ages (Table 1). However there was a significant (Pd"0.05) difference between the mean body weights between *Indigenous* and *Kuroiler* or *Rainbow Rooster* chicken at different ages of study. Significantly higher mean body weights in *Kuroiler* and *Rainbow Rooster* than *Indigenous* birds might be due to inheritance of superior germplasms in the improved varieties. The present findings were corroborated the findings of Islam *et al.* (2014) in indigenous chicken under backyard system. In comparison to the present findings, Sharma *et al*. (2015) recorded much higher average body weight (2.6 Kg) of *Kuroiler* birds at 25 week and lower body weight (3.0 Kg) at 43 weeks of age under scavenging system in Uganda. In contrast to the present findings, Ahmad (2016) reported much higher body weight as 1100 gm in *Rainbow Rooster* at 8 week under scavenging system. The higher body weights reported by the earlier workers might be due supplemental feeding or sufficient scavenging feed resource base.

The mean age at first egg were recorded as 184.65±1.02 and 179.78±1.87 days in case of *Kuroiler* and *Rainbow Rooster* chicken respectively and there was no significant (Pd"0.05) difference between the two genotypes (Table 1). However, *Indigenous* chicken attained sexual maturity significantly late than other two varieties. Deka *et al.* (2014) also reported almost similar age at sexual maturity (191.25 ± 1.46 days) in indigenous chicken. In contrast to the present results, *Kuroiler* and *Rainbow Rooster* attained sexual maturity much earlier as 5 months (Ahuja *et al.* 2008) and 160 days (Ahmad, 2016) respectively. The earlier sexual maturity reported by the previous workers might be due to better scavenging feed resource base in the respective areas.

The mean egg production of *Kuroiler*, *Rainbow Rooster* and *Indigenous* chicken is presented in Table 1. The mean egg production was significantly higher in improved varieties than the *Indigenous* chicken. However there was no significant (Pd"0.05) difference between the two improved genotypes although *Rainbow Rooster* numerically produced more eggs than *Kuroiler*.

Significantly (Pd"0.05) higher egg production in improved genotypes than *Indigenous* chicken might be due to presence of improved germplasm in the improved birds. The present findings were comparable with the findings of Ahuja *et al.* (2008) and Ahmad (2016) in case of *Kuroiler* and *Rainbow Rooster* birds respectively. In contrast to the present results Deka *et al.* (2014) reported much lower egg production in indigenous chicken under backyard system.

The mean egg weights of *Indigenous* chicken at 32nd, 40th and 52nd weeks of age were significantly lower than two improved varieties at corresponding ages. The mean egg weight did not differ significantly (Pd"0.05) between two improved varieties at different weeks of ages. The numerical values of egg weights in case of *Kuroiler* were found to be higher than

Table 1: Production performances of *Kuroiler, Rainbow Rooster* and *Indigenous* chicken

Parameters	*Kuroiler*	*Rainbow Rooster*	*Indigenous*
Body weight (g) at			
8th week	773.21±5.83[a]	713.13±5.16[a]	365.12±2.34[b]
20th week	1705.52±10.01[a]	1652.15±7.87[a]	781.11±5.23[b]
40th week	3005.21±16.05[a]	2871.03±19.23[a]	1194.33±8.11[b]
52nd week	3531.07±20.12[a]	3364.07±21.34[a]	1392.43±15.11[b]
Age at first egg (days)	184.65±1.02[a]	179.78±1.87[a]	197.31±2.11[b]
Egg production (nos.) up to			
32nd week	29.13±1.01[a]	33.27±0.17[a]	12.27±0.03[b]
40th week	51.18±0.32[a]	52.93±0.28[a]	28.22±0.18[b]
52nd week	86.25±1.02[a]	88.31±0.97[a]	45.17±0.72[b]
72nd week	159.43±1.06[a]	163.43±1.34[a]	77.11±0.86[b]
Egg weight (g) at			
32nd week	51.02±0.21[a]	47.07±0.23[a]	28.15±0.04[b]
40th week	54.27±0.24[a]	51.03±0.27[a]	31.36±0.07[b]
52nd week	57.17±0.26[a]	54.07±0.15[a]	37.18±0.13[b]
Mortality (%)			
0 to 5th week	10.13±1.02[a]	12.44±1.33[a]	6.04±0.86[b]
6 to 30th week	4.24±0.03[a]	3.71±0.04[a]	1.21±0.43[b]
30 to 52nd week	1.07±0.02[a]	1.54±0.01[a]	1.08±0.43[a]
Fertility (%)	93.18±5.43[a]	91.62±6.81[a]	94.42±5.37[a]
Hatchability (%) on TES	84.23±5.12[a]	85.72±7.81[a]	87.32±4.35[a]
Hatchability (%) on FES	95.32±1.36[a]	96.07±3.12[a]	95.06±2.32[a]

Means bearing different superscripts in a row differ significantly (P<0.05)

Rainbow Rooster, which might be due comparatively higher body weight of *Kuroiler* than *Rainbow Rooster* birds. The present findings were also in accordance with the findings of Ahuja *et al.* (2008) in *Kuroiler* and Chutia *et al*. (2012) in indigenous birds.

The percent mortality was significantly (Pd"0.05) lower in *Indigenous* chicken while compared to the improved genotypes in different ages. The mortality rates were decreased with the advancement of age of the birds in all three cases (Table 1). During 0-5 weeks of ages, the higher mortality rate in case of *Kuroiler* (10.13±1.02) and *Rainbow Rooster* (12.44±1.33) was due to cold shock because of improper brooding arrangement. However in *Indigenous* chicken, early higher mortality rate (6.04±0.86) was due to cold shock and predation. The present findings were in the accordance with the findings of Bhattacharya *et al.* (2005) and Niranjan and Singh (2005) who reported the mortality rate ranged between 1-15 percent in improved backyard poultry under similar conditions. However Zuyie *et al*. (2009) reported much lower mortality ranged between 3.31±1.75 to 4.73±1.53 percent in *Vanaraja* chicken up to 252 days of age.

The percent fertility of *Kuroiler*, *Rainbow Rooster* and *Indigenous* chicken eggs was found to be 93.18, 91.62 and 94.42 respectively (Table 1). Although the numerical values were higher in *Indigenous* chicken compared to others, there was no significant (Pd"0.05) difference of fertility among the three genotypes. In contrast to the present findings, Sankhyan and Thakur (2016) reported much lower fertility in case of Vanaraja (86.82±2.26) and indigenous (87.84±1.54) chicken.

The numerical values for percent hatchability on TES and FES were recorded lower in case of *Kuroiler* (84.23) and *Indigenous* (95.06) chicken eggs respectively (Table 1).

However there was no significant (Pd"0.05) difference in hatchability (both on TES and FES basis)

percent among the three varieties under study. The highest hatchability (FES) was recorded in case of *Rainbow Rooster* birds. Islam *et al.* (2014) also reported similar trends of hatchability (both on TES and FES basis) in Vanaraja and indigenous chicken under same conditions.

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