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Comparative study of various Economic Traits of Kamrupa and Indigenous Chicken under Backyard Rearing System in Assam

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ABSTRACT

The present study has been undertaken to assess various economic traits of Kamrupa birds under backyard system of rearing in Assam. The data on body weights at day old, 5, 20, 40, 52 and 72 weeks of age, age at first egg, egg production up to 40, 52 and 72 weeks of age, egg weights at 32, 40, 52 and 72 weeks of age, the age at sexual maturity, carcass characteristics, egg quality traits, fertility and hatchability were recorded. The mean body weights at 0, 5, 20, 40, 52 and 72 weeks of age were recorded as 37.60g±2.90, 220.50g±38.20, 1030.50g±110.30, 1710.60g±410.50, 1790.60g±380.30, 2010.20g±290.10 respectively in Kamrupa and 34.20g±2.60, 110.30g±32.70, 720.70g±110.70, 1260.60g±410.60, 1410.20g±320.40, 1630.30g±310.20 respectively in case of indigenous chicken. Confirmation traits like shank length, breast angle and keel length were recorded as 49.90mm±4.30, 51.70 degree ±7.20 and 53.90mm±8.20 in Kamrupa and 50.30mm±3.10, 49.70 degree ±6.40 and 52.10mm±7.30 in Indigenous under backyard system, respectively.The mean egg production up to 40, 52 and 72 weeks of age in Kamrupa were recorded as 43.90±2.60, 85.50±5.60 and 148.60±10.80 numbers respectively and in case of indigenous chicken, the corresponding values were recorded as 24.90±2.50, 44.80±3.50 and 76.30±4.30, respectively.

KEYWORDS

Kamrupa, Assam, Chicken, Backyard Poultry

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INTRODUCTION

Assamese people have a long tradition of keeping poultry for their nutritional and livelihood security since the time of immemorial. This bird provides supplementary source of income to the rural masses (Roy *et al*, 2019). Majority of the farmers keeps 10-15 numbers of low input indigenous chicken at their backyard for both egg and meat production to meet their day to day petty expenses and nutritional security (Islam *et al*, 2014). On the other hand the productivity of native indigenous chicken is very low due to their inherent low genetic potential. Kamrupa, a dual type high yielding chicken developed under AICRP on poultry breeding, AAU, Khanapara and successfully introduced in various parts of North East is giving promising productive and reproductive performance under backyard system of management. However, information on systemic studies on the productive and reproductive performance of Kamrupa birds under backyard system in Assam is very scanty. Keeping these in view, the present study has been undertaken to assess various economic traits of Kamrupa birds under backyard system of rearing in Assam.

MATERIALS AND METHODS

The study was conducted in the Kamrup district of Assam. A total of 400 numbers of unsexed day old Kamrupa and 400 numbers of indigenous chicks were procured from hatchery of AICRP on poultry breeding, AAU, Khanapara. They were brooded for 21 days under hover brooder and were provided with sufficient clean drinking water and commercial broiler starter feed ad libitum during the brooding period and were distributed among 20 numbers of experienced farmers, each with 20 numbers of Kamrupa and 20 numbers of indigenous chicks. The farmers were selected randomly who kept a minimum of 10 numbers of indigenous chickens of different ages under backyard system. After proper brooding the birds were let loose in the backyard and supplemented with the maize, rice polish, wheat etc along with natural feeding. The birds were vaccinated against Marek's, Ranikhet, Gumboro and Fowl pox diseases by following standard vaccination method and schedule. The data on body weights at day old, 5, 20, 40, 52 and 72 weeks of age, age at first egg, egg production up to 40, 52 and 72 weeks of age, egg weights at 32, 40, 52 and 72 weeks of age were recorded.The age at sexual maturity is considered when the 50% of the pullet starts laying egg. To evaluate carcass characteristics, 20 birds of each group both male and female at random were slaughtered at 20^{th} week of age.For study of egg quality traits 120 egg were collected and evaluated. For study of fertility and hatchability, 200 numbers of eggs were collected within a period of one week from different stocks and were set in the incubator. The data collected on various traits were subjected to standard statistical analysis (Snedecor and Cochran, 1994).

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RESULTS AND DISCUSSIONS

The mean body weights at 0, 5, 20, 40, 52 and 72 weeks of age were recorded as 37.60g±2.90, 220.50g±38.20, 1030.50g±110.30, 1710.60g±410.50, 1790.60g±380.30, 2010.20g±290.10 respectively in Kamrupa birds and 34.20±2.60, 110.30g±32.70, 720.70g±110.70, 1260.60g±410.60, 1410.20g±320.40, 1630.30g±310.20 respectively in case of indigenous chicken (Table 1). The body weights of Kamrupa birds were significantly (P≤0.05) higher than the corresponding body weights of indigenous chicken, which might be due to utilization of exotic germplasm for the development of Kamrupa. Kalita *et al* (2012a) also reported almost similar body weight of indigenous chicken at 40 weeks of age under intensive system. The higher body weight in intensive system might be due to the supplementation of balanced diet and other proper managemental care. The mean age at first egg was recorded as 170.10±7.10 days in case of Kamrupa and in indigenous chicken it was recorded as 200.90±5.90. There is also a significant (P≤0.05) difference of age at first egg between Kamrupa and indigenous chicken, which might be due to the genetic difference between two groups of birds. Zuyie *et al* (2009) in Nagaland also reported similar findings in case of Vanaraja under extensive system of management. The mean egg production up to 40, 52 and 72 weeks of age in Kamrupa were recorded as 43.90±2.60, 85.50±5.60 and 148.60±10.80 numbers, respectively and in case of indigenous chicken, the corresponding values were recorded as 24.90±2.50, 44.80±3.50 and 76.30±4.30 respectively (Table 1). The mean egg production was also significantly (P≤0.05) differ between the two genetic groups, which might be due to different genetic makeup of two groups. Chutia (2010) also found an overall mean for annual egg production of indigenous chicken of Assam which ranged from 53.8±0.23 to 58.4±0.26. However, Kumaresan *et al* (2008), reported annual egg production of Vanaraja birds as 176±90 under backyard system of rearing.

The mean egg weights of two genetic groups at 32, 40, 52 and 72 weeks of age are presented in the Table 1. There is significant (P≤0.05) difference between the egg weights at different ages. The lower values in indigenous chicken might be due to poor genetic potential of indigenous chicken of Assam. Haunshi *et al* (2009) reported similar egg weight (38.67g±0.31) in Miri breed of chicken. Kalita *et al* (2011) also recorded the average weight of egg as 35.27±0.15g in case of indigenous chicken of Assam.

Table 1: Body weight, conformation and Reproductive traits

Traits	Kamrupa	Indigenous
Body Weight		
Day old	37.60^a ±2.90	34.20^a ±2.60
5^{th} week	220.50^a ±38.20	110.30^b ±32.70
20^{th} week	1030.50^a ±110.30	720.70^b ±110.70
40^{th} week	1710.60^a ±410.50	1260.60^b ±410.60
52^{nd} week	1790.60^a ±380.30	1410.20^b ±320.40
72^{nd} week	2010.20^a ±290.10	1630.30^b ±310.20
Conformation Traits at 5^{th} week of age		
Shank Langth	49.90^a±4.30	50.30^a±3.10
Keel Langth	53.90^a±8.20	52.10^a±7.30
Breast Angle	51.70^a±7.20	49.70^a±6.40
Age At First Egg	170.10^a±7.10	200.90^a±5.90
FCR (at 8^{th} week of age)	2.49	3.58
Egg production up to		
40^{th} week	43.90^a±2.60	24.90^b±2.50
52^{nd} week	85.50^a±5.60	44.80^b±3.50
72^{nd} week	148.60^a±10.80	76.30^b±4.30
Egg weight at		
32^{nd} week	40.80^a±2.60	35.60^b±2.70
40^{th} week	42.20^a±6.90	36.50^b±3.50
52^{nd} week	44.10^a±6.90	38.30^b±4.40
72^{nd} week	45.30^a±7.20	40.10^b±4.90
Egg Quality Traits		
Shape Index	73.29±3.78	72.19±3.98
Albumen Index	0.083±0.009	0.079±0.013
Yolk Index	0.49±0.43	0.47±0.32
Haugh unit	83.16±3.34	81.18±3.46
Shell thickness(mm)	0.35±0.05	0.35±0.05
Fartility(%)	91.10±2.30	92.45±2.80
Hatchability (%) (TES)	82.26±2.60	86.16±2.70
Hatchability (%)(FES)	87.12±2.80	88.49±3.10

The fertility of Kamrupa and indigenous chicken of Assam under backyard system of rearing were found to be 91.10±2.30% and 92.45±2.80% respectively. There was no significant (P≥0.05) difference in fertility percent between two genetic groups. Saikia *et al* (2017) also reported similar findings in Vanaraja and Indigenous chicken of Assam. The hatchability percent was recorded as 82.26±2.60% in

Kamrupa, whereas in case of indigenous it was found as 86.16±2.70 on total egg set basis and 87.12±2.80 and 88.49±3.10, respectively on fertile egg set basis. There was no significant (P≤0.05) difference in hatchability percent between two groups. Kalita *et al* (2012a) reported similar findings in indigenous chicken of Assam. Saikia *et al* (2017) also reported higher rate of percent hatchability on TES 88.52±3.95 and 86.14±3.26 in indigenous chicken of Assam and Vanaraja, These findings are almost similar to present study. Kumar *et al* (2005) reported lower hatchability as 72.6% in Vanaraja birds under traditional system of rearing.

Table 2: Carcass quality traits

Traits	Kamrupa	Indigenous
Live weight(g)	1212.23^a ±112.84	890.33^b ± 102.78
Dressed weight(g)	884.64^a ±82.48	632.93^b ±69.26
Dressing %	73.19±1.83	71.56±2.21
Cut up parts %		
Breast	25.08±1.49	24.70±1.42
Back	15.09±1.71	14.90±1.29
Legs	31.35±1.23	29.40±1.90
Wings	11.96±0.94	12.01±1.41
Giblet	5.89±0.73	6.10±0.81
Heart	0.74±0.12	0.72±0.10
Liver	2.72±0.63	2.86±0.58
Gizzard	2.38±0.42	2.45±0.49

Egg shape index estimated as 73.29±3.78% and 72.19±3.98% in Kamrupa and Indigenous, respectively. Similarly, Niranjan *et al* (2008) estimated the shape index as 76.10 at 32 weeks of age in Vanaraja birds. Kalita *et al* (2012b) reported similar findings in indigenous chicken of Assam. Chatterjee *et al* (2007) observed the shape index of two strains of white Leghorn, i.e for IWI as 73.77±3.08 and IWH as 72.62±7.56. The albumin index was recorded as 0.083±0.009 and 0.079±0.013 in Kamrupa and Indigenous, respectively. According to Haunshi *et al* (2009), the average albumin and yolk index (%) value in improved varieties is higher than indigenous breed. In the present study yolk index, Haugh unit and Shell thickness were recorded as 0.49±0.43, 83.16±3.34, 0.35±0.05 and 0.47±0.32, 81.18±3.46, 0.35±0.05, respectively for Kamrupa and Indigenous birds.

Confirmation traits the shank length, breast angle and keel lengthwere recorded as 49.90mm±4.30, 51.70 degree±7.20and 53.90mm±8.20 in Kamrupa and 50.30mm±3.10, 49.70 degree±6.40 and 52.10mm±7.30 in Indigenous chicken respectively. There were no significant differences between the confirmation traits in both the breed of chicken. Kalita *et al* (2012b) reported similar findings in his study on indigenous chickens of Assam.

The records of the carcass characteristics of Kamrupa and Indigenous are presented in Table 2. There was no significant difference between all the traits except the live weight and dressed weight. Similarly, Kalita *et al* (2012b) recorded the carcass characteristics like live weight (g) at time of slaughter, dressed yield (%), giblet yield(%), ready to cook yield (%) as 1183.23±235.27, 66.09±5.62, 3.99±0.67 and 70.08±6.54 respectively in indigenous birds of Assam.

CONCLUSION

It can be concluded that performance of Kamrupa chicken is better than indigenous chicken in terms of body weight, egg production as well as for other traits under backyard system of rearing. So, it is recommended that farmers of Assam in rural and tribal areas can rear Kamrupa chicken for their livelihood and nutritional security.

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