The Pharma Innovation Journal 2023; SP-12(12): 2674-2676

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(12): 2674-2676

www.thepharmajournal.com
Received: 02-10-2023
Accepted: 06-11-2023

Dipankar Bharali
Junior Scientist, AAU- Zonal Livestock Research Station, AAU, Mandira, Assam, India

Debashish Borah
Senior Scientist and Head, Krishi Vigyan Kendra, Assam Agricultural University, Lalpool, Udalguri, Assam, India

P Rajbonshi
SMS, Krishi Vigyan Kendra, Assam Agricultural University, Lalpool, Udalguri, Assam, India

P Boro
Junior Scientist, AAU- Zonal Livestock Research Station, AAU, Mandira, Assam, India

M Sonowal
Junior Scientist, AAU- Zonal Livestock Research Station, AAU, Mandira, Assam, India

G Das
Junior Scientist, AAU- Zonal Livestock Research Station, AAU, Mandira, Assam, India

Corresponding Author:
Dipankar Bharali
Junior Scientist, AAU- Zonal Livestock Research Station, AAU, Mandira, Assam, India

Impact of a newly developed Kamrupa birds in backyard system of rearing

Dipankar Bharali, Debashish Borah, P Rajbonshi, P Boro, M Sonowal and G Das

Abstract
Kamrupa is one of the newly improved variety of chicken which has been developed by the Assam Agricultural University. It is suitable for backyard farming system and highly adaptable in climatic condition of Assam. The present study was conducted on 500 newly introduced Kamrupa and 500 local birds. Under Tribal Sub Plan project, these birds were reared in backyard system at Udalguri district of Assam. Fifty women from five villages of the district were selected and provided with day old Kamrupa birds (100 nos./woman). Performance parameters viz age at sexual maturity, egg production, egg weight, mortality rate, and carcass traits were recorded and analysis was done following standard method. At 40th week of age, the body weight of Kamrupa and local birds was found to be 2067.43±10.50 and 985.75±9.34 grams, respectively. Age at first egg laying was found to be 178.50±1.25 days in Kamrupa and 234.68±2.50 days in local birds. Annual egg production of Kamrupa and local bird was recorded as 138±2.10 and 76±1.50 numbers, respectively. The benefit cost ratio (BCR) was recorded as 1.42:1 and 1.20:1 at 20 week of age (male Kamrupa and local male bird) whereas it was found that the value for female Kamrupa and local female bird w.r.t BCR as 1.52:1 and 1.37:1. Though the performance of local birds is poor than the improved variety i.e Kamrupa but adaptability is very outstanding.

Keywords: Kamrupa, performance, traits, BCR, adaptability and climate

Introduction
Little attention has been received by the rural and tribal areas in poultry sector which is creating a large gap in the availability of highly nutritious eggs and chicken. A solution to the situation can be arrived through backyard farming system with improved variety of chicken in rural and tribal areas. Despite, slow progress in rural poultry sector, the contribution of backyard poultry towards egg production is tremendous i.e about 30 to 40 per cent (Panda *et al*. 2008) [9].

A large number of tribal and rural families improved their economic status through backyard farming as it is a low input or no input venture (Singh and Johari 1990 and Saha 2003) [12, 11]. Backyard poultry farming provides meat and eggs at the earliest thereby petty cash can be rewarded. With minimal external inputs, minimal human attention and causing minimal disruption to the environment, the venture can be started. Backyard poultry farming, is income generating venture particularly for the rural women (Niranjan *et al*. 2008 and Dey *et al*. 2019) [7, 2]. As there is no social taboo, the demand for poultry and its products is very high. Kamrupa is one of the newly introduced improved variety, developed by the Assam Agricultural University suitable for backyard farming system. It was developed by crossing the indigenous chicken with a broiler parent (PB-2) and a layer parent (Dalhem Red). Kamrupa is a multicoloured dual purpose breed (Kalita *et al*. 2016) [5, 6]. Hence, Kamrupa birds were introduced in a few tribal villages of Udalguri district to study their adaptability, reproductive ability and economic viability under traditional backyard system of rearing.

Materials and Methods
The present study was conducted at tribal villages of Udalguri district from 2015 to 2018 under Krishi Vigyan Kendra. Day old Kamrupa chicks (500 nos.) were provided to fifty women of five villages of the district as well as five hundred (500) local day old local chicks were also taken for the study from the same villages. Before providing the chicks, the women were given training on "Improved poultry rearing scientifically in backyard system". Brooding of the day old Kamrupa chicks were done during first thirty days on the other hand local chicks were reared as per traditional method.

After that, the birds were reared in backyard system. Different traits viz age at sexual maturity, egg production, egg weight, mortality rate and carcass traits were recorded. Standard vaccination, deworming and supplementation schedule were followed to maintain proper health conditions of the birds. The data were recorded and analysed to obtain descriptive statistics of various performance traits by using standard statistical analysis (Snedecor and Cochran, 1994) [14].

Feeding system: The birds were allowed to feed whole day in the backyard of farmer's house where they eat natural vegetation, insects, earthworm, fallen grains, kitchen waste and other edible items. Besides, the birds were provided with 50 g commercial feed daily.

Performance parameter

Live body weight of Kamrupa and local birds at 0 day, 8 week, 20 week, 32 week and 40 week of age were recorded. Confirmation traits viz shank length, keel length and breast angle of the birds at 5 weeks of age were also measured with the help of scale and breathometer. Besides, age at first egg laying, number of egg production, egg weight and mortality was also recorded. Egg quality traits were assessed at 40th weeks of age. For this, a total of 100 eggs each from two groups were collected. The incurred expenditure was recorded as per existing market price for different inputs to assess the cost benefit of rearing Kamrupa and local birds. The data generated were calculated (means of various traits) and analysed using standard statistical methods (Snedecor and Cochran, 1994) [14].

Impact: Feedback from farmers were collected to find out the impact of the study.

Results and Discussions

Results obtained i.e mean with standard error for various traits of Kamrupa and local birds reared in backyard system of the study area has been presented in table 1. In addition, significant differences were indicated by different superscripts in the table 1.

Body weight

The mean body weight of Kamrupa at 0 day, 8th week, 20th week, 32nd week and 40th weeks of age were higher than the local bird and are found to differ significantly (p<0.05). The difference might be due to superior germplasm used in the development of Kamrupa breed. Similarly, the present findings corroborates with the findings of Kalita *et al.* (2016) [5, 6]. In contrast to the present findings, Sonia *et al.* (2019) [13] and Dutta *et al*. (2019) [3] recorded higher body weight in case of Vanaraja bird.

Confirmation traits

The confirmation traits of Kamrupa and local birds like breast angle, keel length and shank length were recorded as 62.75^0 and 61.85^0, 4.28 and 4.41 cm; 3.76 and 3.68 cm respectively. Similar finding were reported by Kalita *et al.* (2016) [5, 6].

Table 1: Mean±SE for various traits of Kamrupa and local birds

Parameters of study	Kamrupa bird	Local bird
Average Body weight (g)		
Day old	38.44±0.41^a	29.05±0.52^b
8 week	565.56±3.20^a	260.75±2.50^b
20 week	1445.54±9.51^a	580.43±4.52^b
32 week	1875.68±10.21^a	745.66±7.35^b
40 week	2067.43±10.50^a	985.75±9.34^b
Conformation traits at 5 weeks of age		
Shank length (cm)	4.28±0.20	4.41±0.30
Keel length (cm)	3.76±0.1	3.68±0.05
Breast angle (^{o})	62.75±1.10	61.85±1.20
Age at first egg laying (days)	178.50±1.25^a	234.68±2.50^b
Egg production (number / bird / year)	138±2.10^a	76±1.50^b
Egg weight (g) at		
32 week	43.24±1.10^a	34.12±1.12^b
40 week	54.82±1.50^a	36.54±1.60^b
Egg quality traits		
Shape index	76.12±2.31	75.46±2.20
Albumin index	0.082±0.001	0.078±0.002
Yolk index	0.402±0.002	0.410±0.003
Haugh unit	80.22±3.20	78.32±3.10
Shell thickness	0.291±0.03	0.290±0.04
Egg colour	Brown	Brown
Mortality (%)		
0-8 weeks	4.72±0.15	6.44±0.55
8-24 weeks	2.54±0.25	3.55±0.30
24-40 weeks	1.67±0.40	1.12±0.20
Dressing percentage (Combined sex)	68.65±2.50^a	64.54±2.60^b
Earning		
From male bird at 20 week (Rs.)	125/-	34/-
From female bird (Rs.)	461/-	304/-
B:C ratio		
Male bird at 20 week	1.42	1.20
Female bird per year	1.52	1.37

** Figures in the above table with different superscript differ significantly (p<0.05).

Production of egg and egg weight

Significant differences ($p \leq 0.05$) were noticed *w.r.t* egg production and egg weight in Kamrupa bird as compared to local birds and it might be due to breed differences, supplemented feeding and better managemental practices adopted. The age of first egg laying in Kamrupa and local bird was found to be 178.50 and 234.68 days, respectively. Mean annual egg production in Kamrupa was recorded as 138 numbers, the egg weight at 322nd and 40th week were found to be 43.24 and 54.82 g, respectively. In contrast, mean annual egg production, the egg weight at 32nd and 40th week in local bird were found to be 76 numbers, 34.12 g and 36.78 g, respectively. The dressing percentage of the Kamrupa and local bird was found to be 68.65 and 64.54 %, respectively. Similar findings in terms of egg weight, egg production were reported by Kalita *et al.* (2016) [5, 6]. In contrast, Sharma and Hazary (2002) [10] reported lower egg weight of Vanaraja birds at 40 weeks of age.

Egg quality traits

Egg shape index of Kamrupa and local bird were recorded as 76.12 and 75.43, respectively. Similarly, Kalita *et al.* (2016) [5, 6] and Niranjan *et al*. (2008) [7] in Kamrupa birds and Vanaraja birds, respectively. In contrast, slight lower values was reported by Chatterjee *et al*. (2007) [1] in white Leghorn.

In present study, albumin index of Kamrupa and local bird was recorded as 0.082 and 0.078, respectively. Similar findings were also reported by Kalita *et al.* (2016) [5, 6]. In contrast, higher values were reported by Padhi *et al*. (1998) [8] in white Nicobori chicken and Yadav *et al*. (2009) [15] in Uttar Pradesh chicken.

Yolk index, Haugh unit, shell thickness and egg colour of Kamrupa and local bird were recorded as 0.082 and 0.078; 0.402 and 0.410; 80.22 and 78.32 and brown and brown, respectively. Similarly, Kalita *et al.* (2016) [5, 6] and Yadav *et al*. (2009) [15] reported similar values about the egg quality traits.

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