P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; SP-Issue 3; March 2024; Page No. 110-112

Received: 12-12-2023
Accepted: 16-01-2024

Indexed Journal
Peer Reviewed Journal

Evaluating the varied economic traits of Kamrupa chickens in backyard rearing systems of Assam

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DOI: https://doi.org/10.33545/26180723.2024.v7.i3Sb.406

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Abstract

Kamrupa, a dual-type, high-yielding chicken breed developed through the efforts of the AICRP on Poultry Breeding at AAU, Khanapara, has been successfully introduced across various regions of the North East. However, comprehensive studies regarding the productive and reproductive performance of Kamrupa chickens under the backyard rearing system in Assam are exceedingly limited. With this gap in mind, the current research aims to evaluate the economic characteristics of Kamrupa chickens within the context of the backyard rearing system in Assam.

The study encompassed a range of parameters, including body weights at various stages (day old, 5, 20, 40, 52, and 72 weeks), age at initial egg laying, egg production up to 40, 52, and 72 weeks, egg weights at 32, 40, 52, and 72 weeks, age at sexual maturity, carcass attributes, egg quality traits, fertility, and hatchability. Analysis of the data revealed that the average body weights for Kamrupa chickens were as follows: 36.59±2.45 (day old), 218.25±28.95 (5 weeks), 1045.19±31.02 (20 weeks), 1721.56±41.57 (40 weeks), 1756.57±43.31 (52 weeks), and 2045.65±59.26 (72 weeks).

Egg production data highlighted that Kamrupa chickens yielded 42.34±2.96, 83.56±5.96, and 143.45±8.69 eggs up to 40, 52, and 72 weeks, respectively. In conclusion, the study implies that Kamrupa chickens exhibit superior performance in terms of body weight, egg production, and various other traits when reared under the backyard system in Assam.

Keywords: Evaluating, economic, Kamrupa, rearing, AICRP

Introduction

The people of Assam have a longstanding tradition of engaging in poultry farming, a practice deeply rooted in their history. This practice holds significant importance for their nutritional sustenance and livelihood security, a tradition that has been upheld for countless generations. Poultry rearing, specifically, serves as a supplementary income source for rural communities. A notable proportion of farmers maintain a modest flock of 10 to 15 indigenous fowls, characterized by their low resource requirements, within their residential spaces. This practice serves a dual purpose of producing both eggs and meat, contributing to their day-to-day financial needs and nutritional well-being, as documented by Islam *et al*. (2014) [4]. Conversely, the native indigenous fowls exhibit notably limited productivity due to their inherent genetic constraints, resulting in modest yields. A promising solution to this challenge has been the development of Kamrupa, a dual-purpose, high-yield chicken breed. Borne out of the efforts of the AICRP on Poultry Breeding at AAU, Khanapara, this breed has made successful inroads into various regions of the North East. Particularly noteworthy is Kamrupa's ability to showcase commendable levels of both productive and reproductive performance when managed within a backyard system. However, a notable gap exists in our understanding of the systematic performance of Kamrupa chickens under backyard management in Assam. Recognizing this knowledge void, the current research endeavors to comprehensively evaluate the various economic traits associated with Kamrupa chickens raised in a backyard rearing setup within the context of Assam.

Materials and Methods

The research was carried out within the geographical bounds of Kamrup district in Assam. A comprehensive examination involving 200 unsexed day-old Kamrupa chicks and an equivalent number of indigenous chicks was undertaken. These chicks were procured from the hatchery managed by the AICRP on Poultry Breeding at AAU, Khanapara. Subsequently, the chicks were raised under hover brooders for duration of 21 days. During this critical brooding phase, the chicks had access to an ample supply of clean drinking water and were provided with commercial broiler starter feed on an ad libitum basis. Following the successful brooding period, the chicks were then distributed amongst 10 skilled farmers. Each of these farmers received 20 Kamrupa chicks. The selection of these farmers was executed through a randomized process. The criterion for farmer selection was that they should have already been maintaining a minimum of 10 indigenous chickens of varying ages within a backyard setting. Upon completion of the brooding period, the chickens were released into the backyard environment, where their diet was supplemented with Rice, rice polish, wheat, Maize and other natural

sources of nourishment. The birds were also subjected to vaccinations against Marek's, Ranikhet, Gumboro, and Fowl pox diseases. The vaccination process adhered to established protocols.

Various data points were meticulously recorded throughout the study period. This included observations of body weights at key timeframes - Day old, 5 weeks, 20 weeks, 40 weeks, 52 weeks, and 72 weeks of age. Additionally, age at first egg laying, egg production up to the 40th, 52nd, and 72nd week, and egg weights at the 32nd, 40th, 52nd, and 72nd week were documented. A detailed assessment of egg quality attributes was conducted using 120 collected eggs.

The age at which sexual maturity was attained was identified as the point when 50% of the pullets commenced laying eggs.

The collected data pertaining to various traits underwent rigorous analysis utilizing established statistical methods as outlined by Snedecor and Cochran (1994) [12].

Results and Discussions

The average body weights at various ages - 0, 5, 20, 40, 52, and 72 weeks - were meticulously recorded. Specifically, for Kamrupa, the weights were noted as 36.59±2.45, 218.25±28.95, 1045.19±31.02, 1721.56±41.57, 1756.57±43.31, and 2045.65±59.26 respectively. (as indicated in Table 1). In contrast, Ramana *et al*. (2010) observed higher body weights in Vanaraja birds at various ages under an intensive management scheme, a difference potentially stemming from the implementation of a well-balanced diet and other comprehensive management practices.

Additionally, the mean age at which Kamrupa commenced egg laying was documented at 174.59±8.26 days, this aligns with the observations of Zuyie *et al*. (2009) [14] in Nagaland, who noted analogous findings with Vanaraja birds under an extensive management system.

Moving on to egg production, Kamrupa demonstrated considerable output up to 40, 52, and 72 weeks of age, with figures recorded as 42.34±2.96, 83.56±5.96, and 143.45±8.69 respectively. (as illustrated in Table 1). This concurs with the findings of Chutia (2010) [1], who reported an overall mean annual egg production range of indigenous chickens in Assam from 53.8±0.23 to 58.4±0.26. Conversely, Kumaresan *et al*. (2008) [9] reported a notably higher annual egg production figure of 176±9 for Vanaraja birds reared in a backyard setting.

The mean egg weights were documented at 32, 40, 52, and 72 weeks of age and are presented in Table 1. This observation aligns with the findings of Haunshi *et al*. (2009) [3], who reported a similar egg weight of 38.67g±0.31 in the Miri breed of chickens. Likewise, Kalita *et al*. (2011) [5] documented an average egg weight of 35.27±0.15g in the case of indigenous chickens in Assam.

The fertility rates of Kamrupa chickens reared under a backyard system in Assam were determined to be 91.10±2.30%. These findings align with the research conducted by Saikia *et al*. (2017) [13], who reported similar results in Vanaraja and Indigenous chickens of Assam.

Examining hatchability percentages, Kamrupa recorded 83.62%, on a total egg set basis, and 86.48% on a fertile egg set basis. Saikia *et al*. (2017) [13] also reported higher percentages of hatchability on a total egg set basis (88.52±3.95% and 86.14±3.26%) in indigenous and Vanaraja chickens of Assam, aligning closely with the present study. In contrast, Kumer *et al*. (2005) [8] reported a lower hatchability rate of 72.6% in Vanaraja birds under a traditional rearing system.

The egg shape index was determined to be 73.18±3.28% for Kamrupa chickens. Similarly, Niranjan *et al*. (2008) [10] estimated a shape index of 76.10 at 32 weeks of age in Vanaraja birds. Consistent with the current study, Kalita *et al*. (2012a) [6] found analogous results in indigenous chickens of Assam. Observed shape indices of 73.77±3.08 and 72.62±7.56 for two strains of white Leghorn chickens. The albumin index measured 0.086±0.008 for Kamrupa. Haunchi *et al*. (2009) [3] suggested that improved varieties tend to have higher average albumin and yolk index (%) values compared to indigenous breeds. In the present study, the yolk index, Haugh unit, and shell thickness were measured as 0.48±0.02, 84.64±3.94 and 0.35±0.02.

Table 1: Body weight, conformation and Reproductive traits

Traits	Kamrupa
Body Weight	
Day old	36.59±2.45
5th week	218.25±28.95
20th week	1045.19±31.02
40th week	1721.56±41.57
52nd week	1756.57±43.31
72nd week	2045.65±59.26
Age At First Egg	174.59±8.26
FCR (at 8th week of age)	2.49
Egg production up to	
40th week	42.34±2.96
52nd week	83.56±5.96
72nd week	143.45±8.69
Egg weight at	
32nd week	41.85±2.26
40th week	42.36±3.56
52nd week	46.21±3.86
72nd week	47.49±4.25
Egg Quality Traits	
Shape Index	73.18±3.28
Albumen Index	0.086 ± 0.008
Yolk Index	0.48±0.02
Haugh unit	84.64±3.94
Shell thickness(mm)	0.35±0.02
Fartility (%)	87.23
Hatchability (%) (TES)	83.62
Hatchability (%) (FES)	86.48

Conclusion

To draw a comprehensive conclusion, the Kamrupa chicken stands out with a notably superior performance compared to the indigenous bird across multiple facets including body weight, egg production, and various other traits. Particularly, this advantageous performance is evident within the context of a backyard rearing system when contrasted with the indigenous breed of Assam. The implications of these findings are noteworthy, especially for farmers hailing from the rural and tribal regions of Assam. Given the heightened performance of the Kamrupa chicken, it emerges as a compelling option for these farmers seeking to bolster both their livelihoods and nutritional security. By opting to rear Kamrupa birds, these farmers can potentially

tap into a more productive and reliable source of income, along with a consistent supply of nutritious eggs. This choice aligns well with the specific challenges faced in these regions, offering a practical solution that could contribute significantly to the economic and dietary well-being of the farming communities.

In essence, the research underscores the potential benefits of integrating Kamrupa chickens into the rearing practices of rural and tribal farmers in Assam. The superior attributes of Kamrupa chickens, particularly in terms of body weight, egg production, and overall performance, indicate a promising avenue for enhancing the livelihoods and nutritional security of these communities.

Acknowledgement

The authors gratefully acknowledge the essential support provided by ICAR. Additionally, heartfelt thanks are extended to all the personnel at AICRP on poultry breeding, Khanapara, for their valuable assistance

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