

ID: 734

Behavioral Pattern and Welfare Status of Indigenous Chicken in Rural Communities of Bangladesh

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Abstract

Poultry production constitutes a pivotal component of the rural economy in Bangladesh, with indigenous chickens representing one of the most significant poultry species. This study was conducted across five Upazilas in the Barishal district of Bangladesh to investigate the behavioral patterns and welfare status of indigenous chickens within rural communities. Indigenous chickens are still regarded as ☐xpre sources of income, food security, and employment for rural populations. However, the welfare of these chickens often remains overlooked due to a lack of knowledge and awareness among the people.

Key behavioral aspects such as dust and sand bathing, foraging, scratching, roosting, pecking, nesting, peck order, brooding, and hen-chick relationships were meticulously documented in this study. Welfare assessments concentrated on housing, feeding, drinking, and health conditions. The findings revealed that indigenous chickens exhibit a diverse array of behavioral patterns. Notably, 84.5% of the chickens engaged in foraging, while 82.6% participated in dust and sand bathing; 79.5% demonstrated roosting and perching behavior. Among social interactions, 73.9% of male birds displayed a peck order. Brooding, observed in 81.4% of the subjects, is also a pronounced reproductive behavior among indigenous chickens. A significant majority, 78.3%, exhibited mating behavior, and the hen-chick relationship, characterized by 80.1%, reflects a critical maternal instinct.

Nonetheless, welfare challenges pose significant constraints on the ability of indigenous chickens to ☐xpress their natural behaviors. Inadequate feeding, drinking, housing, and healthcare facilities emerged as primary welfare issues. The study underscores that the appropriate expression of behavioral patterns and welfare conditions could enhance the production performance of indigenous chickens. Disseminating knowledge regarding the proper rearing of indigenous chickens and fostering awareness among rural communities about essential welfare tools such as improved housing, balanced nutrition, and vaccination programs can significantly elevate the production performance of indigenous chickens and contribute to the development of sustainable poultry production.

Keywords: Indigenous chicken, behavior, welfare, food security, and sustainable development

Introduction

Bangladesh possesses a rich historical legacy of rearing indigenous chickens. In rural communities, these chickens are raised not only for livelihood and income generation but also for ensuring protein security and alleviating unemployment among youth, women, and children. Despite the socio-economic and nutritional significance of indigenous chickens, issues surrounding their behavioral patterns and welfare have not garnered adequate scientific attention in Bangladesh.

Indigenous chickens in rural settings exhibit a diverse array of behaviors, including scavenging, dust bathing, sand bathing, perching, preening, egg laying, incubation, and hatching, among others. These behaviors can be categorized as general, social, productive, and reproductive in nature. Bracke and Hopster (2006) elucidated that the natural behavior of animals refers to the actions typically exhibited by these creatures when they are situated in environments that closely resemble their native habitats. Any deviation from these innate behaviors may result in psychological distress, such as depression, in chickens. Indigenous chickens, in rural settings, often forage around household premises to fulfill their nutritional needs; however, in many instances, proprietors provide only a meager quantity of feed, consequently failing to meet the birds' nutritional requirements, which contravene the principles of animal welfare. Behavior is a pivotal component of animal well-being. Ensuring that chickens can maintain and express their natural behaviors significantly contributes to their physical and psychological health. According to the Appleby *et al.*, 2004, behavior reflects an animal's health and environment, studying behavioral patterns can be a useful tool for assessing welfare.

This study examines the current state of indigenous chicken behavior and welfare in the rural regions of Bangladesh. By identifying prevalent behavioral patterns and welfare challenges, the aim of the study was to explore the behavioral patterns and welfare status of indigenous chickens in rural Bangladesh and identify critical challenges and potential areas of improvement.

Materials and Methods



Selection of the Study Area

A comprehensive survey was conducted across five upazillas in the Barishal district, namely Barishal Sadar, Babuganj, Agaljhara, Banaripara, and Gouronodi. The households were meticulously selected based on their behavioral patterns and the welfare status of indigenous chickens within the study area.

Experimental data collection

The study was conducted across five upazilas in the Barishal district, specifically Babuganj, Barishal Sadar, Anaripara, Agaljhara, and Gouronodi, with the objective of investigating the inherent behavioral patterns and welfare assessments of indigenous chickens. A total of 160 households were surveyed, comprising 32 households from each upazila, to facilitate the research. Data were meticulously collected through face-to-face interviews and direct observations.

Statistical Data Analysis

The quantitative and qualitative data was analyzed statistical analysis IBM SPSS version 20.0. Data were analyzed through descriptive statistics. The results were expressed in frequencies, mean, percentage and p value.

Behavioral Parameter

Following behavioral parameters were observed in the study area-

1. General behavioral pattern
 - a. Feeding
 - b. Drinking
 - c. Dust and sand bathing
 - d. Scratching
 - e. Foraging
 - f. Roosting/Perching
 - g. Pecking
2. Social behavior
 - a. Peek order
3. Productive and reproductive behavioral pattern
 - a. Mating
 - b. Nesting
 - c. Brooding
 - d. Hen-Chick- Relationship

Welfare Assessment Framework

Welfare assessment was based on the five freedoms framework (FAO, 2010)

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury, or disease
4. Freedom to express normal behavior
5. Freedom from fear and distress



(a)



(b)



(c)



(d)



(e)



(f)

Figure : (a) Poultry house, (b) Day basket, (c), Alert and active, (d) Scavenging feeding, (e) Dust bathing; and (f) Hen -chick -relationship



Results and Discussions

General behavior pattern of indigenous chickens

Behavior and welfare criteria of indigenous chickens primarily encompass general behavior, social interactions, and both productive and reproductive conduct, among other aspects. This study delves into various dimensions of behavioral patterns and welfare concerns pertaining to indigenous chickens within rural communities in Bangladesh.

Feeding

Table 1 showed a significant majority (89.39%) of the farmers in the study area reared indigenous chickens utilizing free-range scavenging systems. They provide a minimal quantity of feed to the birds, which is inadequate for their nutritional needs. Consequently, hunger is prevalent among the chickens, which contravenes the principles of animal welfare.

Drinking

Respondents in the study area (62.5%) provided no potable water for the birds; consequently, the avian resorted to consuming contaminated water from their surroundings or the effluent of tube wells (**Table 1**). As a result, dehydration is prevalent among indigenous chickens, which contravenes the principles of avian welfare.

Dust and sand bathing

Table 1 showed that 82.6% of flock observed dust bathing in the study area, especially during warmer period of the day which is significant.

Table 1: General Behavioral Pattern of Indigenous Chickens

Variables	Babuganj	Barishal Sadar	Banaripara	Gouronodi	Agaljara	Grand Mean	P Value
Feeding							
Scavenging	18.12	17.5	18.12	18.12	17.5	89.39	0.000*
Supplementation	1.875	2.5	1.875	1.875	2.5	10.63	
Drinking							
Yes	3.75	7.5	10.625	9.375	6.25	37.50	0.013*
No	16.25	12.5	9.375	10.625	13.75	62.50	
Dust and sand bathing							
Yes	16.875	15.625	17.5	17.5	15	82.5	0.000*
No	3.125	4.375	2.5	2.5	5	15.5	
Scratching							
Yes	16.875	15.625	15.625	16.875	15	80	0.000*
No	3.125	4.375	4.375	3.125	5	20	
Foraging							
Yes	18.75	17.5	16.875	17.5	13.75	84.4	0.028*
No	1.25	2.5	3.125	2.5	6.25	15.6	
Roosting or perching							
Yes	16.87	15.625	17.5	15	14.375	79.37	0.114
No	3.125	4.375	2.5	5	5.625	20.63	
Pecking							
Yes	16.875	15.625	18.75	17.5	16.875	85.63	0.000*
No	3.125	4.375	1.25	2.5	3.125	14.37	

*=Significant ($p < 0.05$)

Scratching

Scratching (80.1%) is a common behavioral practice among the birds. Significance number of birds showed scratching behavior (**Table 1**).

Foraging

Indigenous chickens exhibit a remarkable tendency for foraging, with an impressive 84.5% of their activity occurring in the surrounding environment (**Table 1**). They predominantly derive their sustenance from the abundant resources available in their external habitat.

Roosting or Perching

Roosting (79.5%) represents a prevalent behavioral pattern among indigenous chickens (**Table 1**). This practice not only enhances the physiological well-being of the birds but also mitigates soiling of the ground and diminishes incidences of cannibalism within the flock.

Social behavior

Pecking order

One of the most sociable behaviors exhibited by chickens is the establishment of a pecking order, or dominance hierarchy (73.9%). Chickens demonstrate this social stratification among their peers in free-range environments or within a flock. This characteristic is evident within a collective of birds or within a chicken community.



Productive and reproductive behavior

Nesting

Nesting is a prominent and fruitful behavior observed in indigenous chickens, constituting 79.5% of their overall activities (Table 3). These chickens engage in nesting behavior prior to oviposition. To facilitate successful egg-laying, it is imperative to provide suitable nesting environments; consequently, the maintenance of an appropriate nest box significantly enhances egg production.

Mating behavior

Mating behavior is one of the reproductive behaviors of chicks. About 78.3% of birds showed mating behavior in the study area which isn't significant.

Brooding

Brooding behavior showed just after incubation of chicks. Brooding is a maternal instinct of indigenous chicken. About 81.4% of indigenous chicken showed brooding behavior and it's not significant.

Hen chick relationship

Indigenous chicken showed strong hen chick relationship. Most of the cases hen were roaming with birds often too long and showed strong imprint among them. About 80.1% birds showed hen chick relationship which is significant.

Welfare status of Indigenous Chicken

Housing

Poultry houses in the study area were traditional houses, kept miscellaneous poultry species together. This housing facilities don't meet the welfare criteria "freedom from discomfort" and birds were consequently perdition and exposure to environmental stress was common (Rahman *et al.*, 2017).

Table 2: Social behavioral pattern of indigenous chicken

Variables	Babuganj	Barishal Sadar	Banaripara	Gouronodi	Agaljara	Grand Mean	P Value
Pecking order							
Yes	14.375	15.625	15	15	13.75	73.75	0.224
No	5.625	4.375	5	5	6.25	26.25	

*=Significant (p<0.05)

Table 3: Productive and reproductive behavioral pattern of indigenous chicken

Variables	Babuganj	Barishal Sadar	Banaripara	Gouronodi	Agaljara	Grand Mean	P Value
Mating							
Yes	16.875	15.625	17.5	14.375	13.75	78.13	0.074
No	3.125	4.375	2.5	5.625	6.25	21.87	
Nesting							
Yes	16.875	15.625	18.75	13.125	15	79.5	0.018
No	3.125	4.375	1.25	6.875	5	20.5	
Brooding							
Yes	16.875	15.625	17.5	18.75	12.5	81.25	0.008
No	3.125	4.375	2.5	1.25	7.5	18.75	
Hen-chick relationship							
Yes	18.125	15.625	13.75	18.75	13.75	80	0.007
No	1.875	4.375	6.25	1.25	6.35	20	

*=Significant (p<0.05)

Feeding and Drinking

Feeding practices in the study area predominantly consisted of scavenging (89.39%), with only 10.63% of participants providing nutritional supplementation to the birds. Consequently, the birds frequently experienced malnutrition. Access to clean drinking water was available in 37.50 % of cases, which consequently reflects the chickens' freedom from hunger and thirst (Hossen, 2010).

Bio-security and Health Status

Birds have been afflicted by various health concerns, including diseases, infections, and disorders. A mere percentage of respondents had access to veterinary services, and preventive health management practices were predominantly lacking (Rahman *et al.*, 2017; FAO, 2010).

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Health status

No vaccination programme (68.1%) was maintained during rearing of indigenous chicken as a result highest mortality of chicks and adult birds was very common. This is also against welfare.

Conclusion

Indigenous chickens play a pivotal role in the rural communities of Bangladesh. Conducting a behavioral study of these indigenous birds is crucial, as their behaviors are indicative of their welfare status. A deficiency in behavioral expressions can signal significant welfare concerns. Inadequate housing, insufficient nutrition, and health complications pose serious threats to these birds. Conversely, the presence of adequate behavioral expressions contributes to the enhancement of their welfare. It can be concluded that a comprehensive behavioral analysis can significantly elevate the welfare standards of indigenous chickens.

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