Local Chicken (Deshi) Rearing System Under Backyard Farming Condition in Jamalpur Sadar Upazila, Jamalpur



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Abstract

The study was conducted across various areas of Jamalpur Sadar Upazilas, Jamalpur, with the aim of observing the local chicken rearing practices in relation to the socioeconomic status of farmers. The investigation covered aspects such as the phenotypic characteristics of indigenous chickens, their production and reproduction performance, and the occurrence of diseases. Rural inhabitants preferred raising indigenous chickens due to their minimal care requirements, low input, and resource demands. These chickens served as a valuable source of high-quality protein and contributed to the farmers' marginal income. While indigenous chickens were not prolific egg layers (around 45 eggs per year) and didn't yield substantial meat quantities, they exhibited resilience and thrived in the challenging rural environment. Among the rural chicken varieties, some possessed untapped superior genetic traits. Poultry shelters in rural settings were constructed using local materials, and the birds were fed with household leftovers, while also spending a significant portion of their time scavenging for food. The absence of organized breeding programs led to close inbreeding within indigenous chicken stocks. On average, these chickens reached sexual maturity around 234 days, and their eggs weighed approximately 45 grams each. The lack of adequate feed and a high prevalence of diseases posed significant challenges to the advancement of rural poultry farming. The response rate to vaccines stood at roughly 40%. Despite these obstacles, indigenous chicken production in the country was predicted to continue growing due to escalating demands for both eggs and meat.

Keywords: Socio-economic status, Indigenous chicken, marginal income, management, phenotypic traits

Chapter o1: Introduction

The poultry sector, particularly indigenous chicken farming, holds significant promise for reducing poverty in Bangladesh. With approximately 319 million chickens spread across village. Indigenous breeds like Deshi, Aseel, and Naked Neck play a crucial role. These indigenous chickens contribute to most of the domestic egg and meat consumption. The Deshi chicken, an unremarkable breed, makes up around 90% of the local population. In certain regions, nearly 96-98% of households exclusively raise chickens (Islam, 1987; Meijer, 1987). Since the 1960s, its genetic diversity has been decreasing due to the introduction of better breeds from developed nations (Bhuiyan & Amin, 1999).

In Bangladesh, the agricultural sector is vital to the economy, with livestock being a standout sub-sector, contributing around 1.85% to the GDP (DLS, 2022-2023). Poultry, especially indigenous varieties, holds a prominent position within the livestock sector, contributing 16.52% to the agricultural GDP (DLS, 2022-2023). Despite being relatively poor in egg and meat production, indigenous poultry are hardy and well-suited to the rural environment. However, challenges like feed scarcity, disease prevalence, and lack of systematic breeding programs hinder their full potential.

Poultry farming not only generates income but also provides a crucial protein source for diets and holds socio-cultural significance. The role of women in poultry production is notable, as they contribute as both caregivers and extension workers. The popularity of poultry farming, particularly chicken, is on the rise in Bangladesh, and while the data on indigenous chicken is limited, efforts are being made to study their socio-economic impact, phenotypic characteristics, and production performance to further develop this sector.

Objectives of this study:

- The study aims to assess and analyze the productive and reproductive performance of indigenous chickens, providing insights into their efficiency and potential for breeding programs.
- Additionally, it seeks to delve into the socio-economic conditions of the farmers involved, offering a comprehensive understanding of the context in which these chickens are raised.
- Furthermore, the study aims to thoroughly examine the phenotypic characteristics of the indigenous chickens, contributing to a detailed comprehension of their physical traits and genetic diversity.

Chapter 02: Materials and Method

Study Area: The study area was Jamalpur Sadar Upazila, Jamalpur district to acquire recent data on Deshi chicken rearing systems and chicken farmer profiles.

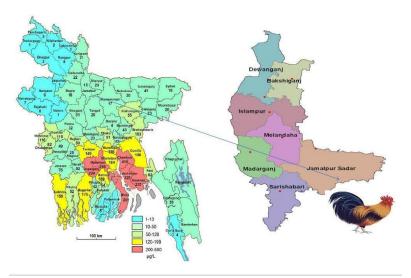


Fig 01: Map of study area (Jamalpur Sadar district, Jamalpur)

Data Collection and Selection of Farms: The goal was to create a production report on indigenous chicken, focusing on socio-economic factors, productivity, reproductive performance, phenotypic traits, and disease prevalence. Farmers were grouped based on flock sizes: 03-10, 10-15, 15-20, and >20 chickens per farm. Interviews were conducted using a questionnaire, as villagers didn't maintain written records. Data was gathered over 2 months through individual interviews and analyzed on time of own UVH (Upazila Veterinary Hospital) placement of internship in May to June month of 2023. The area was chosen for its chicken availability, communication facilities, and lack of prior research.

Husbandry Practices:

Collection of Chicken: Local farmers highlighted that local chickens are readily accessible when needed, unlike exotic breeds. Various sources such as local markets, neighbors, and gifts enable easy access for farmers.

Housing Condition:

In village settings, chicken raisers utilize various types of chicken houses, with the majority not having separate structures. Typically, chickens are raised under a scavenging system or backyard conditions, where they have access to a night shelter or coop. These coops are constructed using materials like bamboo, wood, tin, and mud.

According to the responses of the farmers, there are several ways in which chickens are sheltered:

1. Kitchen Sheltering: Some respondents mentioned that they shelter their chickens in the kitchen area.

2. Common Night Shelter: Some chickens share a common night shelter with household members.

3. Ceiling Shelter: Chickens are sometimes housed in the ceiling of the house.

4. Wooden Basket Shelter: Wooden baskets are used as shelters for the chickens.

5. House with Separate Perching: Some farmers have separate spaces within their houses dedicated

Farmers exhibit varying cleaning routines for their chicken houses:

Daily Cleaning: Some owners clean the chicken houses on a daily basis

Weekly Cleaning: Others clean once a week.

Bi-weekly Cleaning: Some farmers clean their chicken houses twice a week.

These cleaning practices indicate that most farmers prioritize bio-security measures for their chickens, aiming to maintain the health and well-being of their flock. The combination of different sheltering methods and cleaning frequencies highlights the adaptability of chicken raising practices in village environments, where resources and infrastructure might be limited.

Feeding and Watering:

Farmers employ a diverse feeding strategy for their chickens, combining self-produced and purchased options. This includes supplementary feeds given multiple times a day, with the feeding frequency differing among farmers. The use of plastic materials and broken clay pots to dispense feeds is common.

Homegrown crops such as maize, rice polish, broken rice, rice husk, wheat, and along with household leftovers, constitute the primary supplementary feeds. Key grains like wheat and maize are sourced from both personal cultivation and local markets. Young chicks receive special consideration, focusing on promoting growth, egg production, and overall flock well-being.

For hydration, village chickens rely on tap water as their main source. Watering troughs crafted from plastic and clay pots are widely used, with cleaning schedules ranging from once a week to daily for ensuring the hygiene. During dry period, extra attention is given in water intake of the Chicken.

Maternal instinct & nurturing capabilities:

Local chickens are often favored by farmers for their excellent maternal instincts and nurturing capabilities, which are particularly valuable for hatching and breeding purposes. This choice can help increase the overall flock size, and the strong mothering abilities of local chickens can significantly enhance the survival rate of the chicks. However, there might be instances where chickens accidentally break or consume their own eggs, leading to economic losses for farmers. These occurrences could potentially be attributed to deficiencies in certain vitamins or minerals that play a crucial role in eggshell strength and overall egg quality.

Chicken mortality:

In rural areas, chickens reared under free-range conditions often face attacks from predators. Farmers commonly observe that local chickens have a natural ability to escape such predator attacks. These local chicken breeds are also known for their resilience against diseases and their tolerance to heat. Interestingly, there is no discernible difference in disease and heat tolerance between male and female chickens of either breed.

According to feedback from farmers, the primary challenge in village chicken production systems is the substantial mortality rate, which can be as high as 90% during the initial weeks after hatching. This high mortality is primarily attributed to diseases and predation. Deshi chicken normally have high resistance capacity against disease but Ranikhet disease prevalence are most in case of Deshi chicken if disease occurrence.

Data Analysis:

Collected data like Socio-economic status of farmers, Type of feed, Farm size, Housing system, sexual maturity and production performance of local chicken, chicken mortality, were entered into Microsoft Excel 2016 for statistical analysis. The frequency, percentages, were calculated to explain data scientifically. Other data were subjected to normal statistical analyses.



Fig 02: Deshi chicken



Fig 03: House for Deshi Chicken

Chapter 03: Result and Discussion:

3.1. Socio-economic status of farmers

3.1.1Age of farmers:

The ages of farmers ranged from 1 to 60 years. The average age of the duck farmers, as displayed in Table 1. Based on their ages, the farmers were categorized into three groups: young (age 16-31), middle-aged (age 31-50), and old (age > 50).most of the farmers are in middle aged group ,about 59%.

Parameter	Farmers	Frequency(n)	Percentage(%)
	Young age(16-31)	8	29
Age	Middle age(31-50)	16	59
	Old age (> 50)	3	11

3.1.2. Education:

A study revealed that among farmers, 22% lacked literacy, 40% received primary education, and the remaining 38% pursued schooling beyond primary level. Economic constraints discouraged further education, leaving many with of primary schooling due to family financial limitation

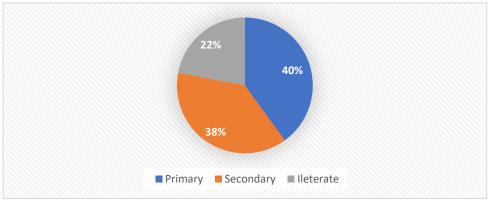


Fig 4: Educational qualification of farmer

3.1.3. Occupation:

Most of the farmers are housewife, some are involved in agriculture,

some are day labor, some businessman, some van puller, rickshaw puller, job holder and others.

Table 02: Occupation of the farmer	Table 02	: Occupation	of the farmer
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Occupation	Frequency (n)	Percentage (%)
Housewife	10	37
Agriculture	5	18
Day labor	2	7
Businessman	2	7
Van Puller	4	14
Rickshaw puller	3	11
Job holder	1	3

3.2. Chicken production strategy:

3.2.1. Housing: most of the house are constructed for chick following separate perching (44%)

Table 03: Type of chicken shelters

Shelter type	Frequency (n)	Percentage (%)
Kitchen shelter	4	14
Common night shelter	2	7
Ceiling shelter	5	18
Wooden basket shelter	4	14
Housing with separate perching	12	44

3.2.2. Farm size:

Farms are divided into 4 categories. Category 01 (3-10), category 02(10-15), Category 03 (15-20), Category 04 (>20), most of the farm size are involved in category 01(55%)

Table 04: farm size

Flock size /Farm size	Frequency(n)	Percentage (%)/
Category 01(3-10)	15	55
Category 02 (10-15)	6	22
Category 03 (5-20)	4	14
Category 04 (>20)	2	7

3.2.3. Breeds of chicken:

In the indigenous chicken population, breeds like Deshi, Aseel, Naked Neck, Hilly, and sometimes dwarf chickens and Red Jungle Fowls are present. Among these, **the non-descriptive Deshi breed** is prevalent in the study areas, valued for its low nutritional needs, disease resistance, and tolerance to heat stress. It contributes significantly, providing 78% of poultry meat and 75% of domestic egg consumption.

3.2.4. Rearing system of chicken:

Deshi chickens are reared in free ranging system in my study areas.

3.2.5. Morphological characteristics of chicken:

In the study, various morphological characteristics of indigenous chickens were observed, including plumage color, eye color, ear lobe color, comb color, skin color, eggshell color, feather color, comb type, and spur. The specific observations for each trait can be found in Table 4.

Traits	Type of local chicken (Deshi)
Plumage color	Black and white
Eye Color	Black
Shank color	Black and yellow
Ear lobe color	Red and White
Comb color	Bright red and Pale
Skin color	White and Yellow
Egg shell color	Light brown and white
Feather Pattern	No definite
Comb type	Mainly single
Spur	Rudimentary

Table 05: Morphological characteristics of Deshi chicken

3.2.6. Sexual maturity & production performance of local chicken (Deshi):

Deshi chickens mature sexually at around 234 days. Indigenous chickens typically start laying eggs between their 29th and 31st week and continue for a little over a year. This peak laying period sees increasing egg size until production ends. Optimal body weight, around 1.5 kg, is crucial during this time, varying by breed. Surveyed chickens had ideal weights of 1.3 to 1.6 kg. Egg production varies by breed; annual output per hen ranges from 45-50 for Deshi chickens in scavenging conditions. Indigenous chicken eggs are smaller than exotic breeds', with Deshi at 35-39g.

Mature	Frequency	Percentage	NO of	Frequency(n)	Percentage
body	(n)	(%)	clutch		(%)
weight(kg)			/year		
1.2-1.3	12	44	2-3	20	74
1.3-1.4	15	55	3-4	7	25
Egg	Frequency	Percentage	Egg	Frequency	Percentage
production	(n)	(%)	weight (g)	(n)	(%)
/hen/year					
40-45	15	55	35-38	25	92
45-50	12	44	38-40	2	7

Table 06: Production performance of Deshi chicken

3.2.7. Types of feed:

Normally farmer use concentrates mainly rice polish, broken rice, rice husk. For this reason, feed cost is low in case of Indigenous chicken (Deshi).most of the family prefer broken rice as a feed for their chicken (55%)

Table 07: Feed type of chicken

Parameter	Frequency(n)	Percentage (%)
Rice polish	5	18
Broken rice	15	55
Rice husk	2	7
Household left over	5	18

3.2.8. Chicken Mortality:

According to feedback from farmers, the primary challenge in village chicken production systems is the substantial mortality rate, which can be as high as 90% during the initial weeks after hatching. This high mortality is primarily attributed to diseases and predation, percentage are 40% and 60% respectively. Prevalence of Ranikhet disease was occurred mainly in the study

areas. Vaccine is available for Ranikhet disease, but sometimes it does not work well. This is the also reason for chicken mortality.

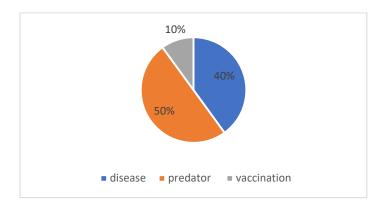


Fig 05: Chicken mortality rate

Yearly income level of farm owners:

The yearly income level of the studied farms is categorized as five groups such as up to Category 01 (Tk 10000), category 02(Tk10000-20000), category 03(Tk 20000-30000) and category 04 above Tk 30000. Only 60% people are involved in category o1, 30% in category 02, 9% people in category 03 and 1% people in category 04. Normally, People can earn money by selling adult chicken, Deshi eggs and from selling chicks besides fulfil their need

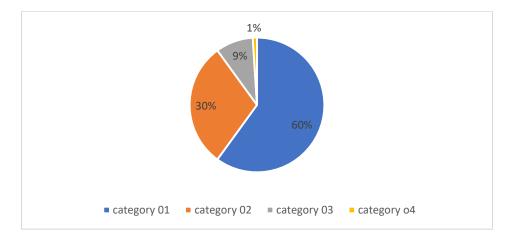


Fig 06: Yearly income level of owners

Chapter 04

Conclusion & recommendation:

This study focused on the positive aspects of backyard indigenous chicken rearing, including morphological traits, productivity, reproduction, and disease frequency. The socio-economic conditions of farmers were also discussed. The results suggest that indigenous chicken rearing is favorable due to farmer awareness and environmental conditions. Rearing indigenous chickens in rural areas can lead to increased profits through meat and egg production. Effective vaccination and management play a crucial role. Training, improved breeding management, healthcare provisions, and disease prevention initiatives could further enhance chicken rearing in Jamalpur district. it's recommended that future research endeavors explore the local chicken farming conditions more comprehensively. A more extended study period with more robust data recording mechanisms and strategies to foster cooperation among farmers and interviewers would likely yield more reliable insights into the productive performances of chickens in the area.

Limitations:

1. Short Study Period: The study was conducted over a brief duration of just two months. This limited time frame might have restricted the depth and accuracy of data collection, potentially overlooking seasonal variations and long-term trends in female farmers' practices and chicken productivity.

2. Lack of Data Recording: The absence of proper data recording mechanisms among female farmers could have posed a significant challenge. This might have resulted in incomplete or inconsistent data, making it difficult to draw robust conclusions about their chicken farming practices and the factors influencing productivity.

3. Uncooperative Farmers: Some farmers might not have been cooperative or receptive to the researchers' inquiries. This resistance could have impacted the quality and quantity of data collected, potentially leading to biased or incomplete findings.

4. Challenges in Interviewer's Role: Ensuring precise and accurate data collection by interviewers can sometimes be complex. Factors like misinterpretation of questions, variations in interview techniques, and difficulties in establishing rapport with participants could affect the reliability of the gathered da

In essence, the study's short duration, lack of proper data recording, uncooperative farmers, challenges faced by interviewers, and the need for more comprehensive research indicate the necessity for a more thorough investigation to provide accurate and valuable insights into the local chicken farming practices and productivity

Chapter 05

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APPENDIX

QUESTIONNAIRE

Farm No: -----;

Date: -----

Data of Local chicken from 6 villages of Jamalpur Upazilas, Jamalpur District in Bangladesh:

1. Farmer's name:

2. Address:

3. Location: _____

4. Type of Farm: Farming size:

5. Socio-economic status of the farmer: a) Age-----b) Sex-----c) Education level------d)

Marital status-----e) Income level: low/high/medium..... f) Type of land and size:

arable/fallow/housing/garden

6. Type/breed of chicken:

7. Price of adult and Day old chicken_____

8. Adult body weight chicken and market price: _____

9. Egg Production /year and market price: _____

10Type of feed.

11. Vaccine given or not, if so, give details:

12. Any vitamin supplement supplied the chicken----- a. Yes b. No

13. If supply, which types of vitamins are supplies? Along with their dose, date, age, generic

name, trade name, price and volume

14. Disease incidences: a. Yes b. No

- 15. If yes, what type of diseases are found? -----
- 16. Diagnosis of disease done? --by a. Clinical signs and symptoms b. Post mortem
- 17. Treatment given by farmer_____
- 18. Mortality rate (%): _____
- 19. Rearing length (age)_____
- 20.frequency of feeding and watering
- 21. Selling cost of chicken and or egg: _____Tk/kg
- 22. Housing type_____
- 23.Brooding system
- 24. Phenotypic character_____
- 25. Any bio-security measures taken: _____
- 36. Rearing system----floor/slat/cage/ scavenging/ free-range/night shelter___?
- 27.Purpose of rearing_____
- 28. Yearly income from selling Deshi chick, its egg or meat:
- 29. Constraints of farms faced by the poultry farmers:

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(Signature of the Surveyor/researcher/Reporter)

Biography

I am Shahrina Afruj Shuchi, Daughter of Late MD. Shahjahan Siraj & Forida Yesmin. I have an impressive academic background, having excelled in both of my Secondary School Certificate and Higher Secondary Certificate Examinations. I passed my Secondary School Certificate from Nabarun Biddya Nikaton, Muktagachha, Mymensingh in 2015 & Higher Secondary Certificate from Shohid Smriti Govt. College from Muktagachha, Mymensingh in 2017. Currently, I am an intern veterinarian at Chattogram Veterinary and Animal Sciences University, with a strong ambition to become a veterinary practitioner and contribute to the betterment of animals in Bangladesh.