



# International Journal of Veterinary Medicine and Animal Science (IJVMAS)

ISSN: 3064-8041 (ONLINE)

VOLUME 2 ISSUE 1 (2025)



PUBLISHED BY  
E-PALLI PUBLISHERS, DELAWARE, USA

## Evaluating Farmer Practices and Perspectives in Rearing Red Chittagong Cattle in Chittagong, Bangladesh

Md. Nahidul Islam<sup>1</sup>, Kazi Abdus Sobur<sup>2</sup>, Md Salman Mostafa<sup>3</sup>, A. A. Jabir<sup>3</sup>, Rayhan Ahmmed Pranto<sup>4</sup>, Tonmay Kumar Biswas<sup>1</sup>  
Mohammad Elisur Rahman Bhuiayan<sup>5</sup>, Md. Shafiqul Islam<sup>6\*</sup>

### Article Information

**Received:** November 30, 2024

**Accepted:** January 01, 2025

**Published:** April 24, 2025

### Keywords

*Disease Resistance, Farmer Practices, Feeding and Breeding, Indigenous Breed, Livestock Management, Red Chittagong Cattle*

### ABSTRACT

Livestock is a vital component of Bangladesh's agricultural economy, contributing significantly to rural livelihoods and food security. Among the indigenous breeds, Red Chittagong Cattle (RCC) stand out for their adaptability, disease resistance, and dual-purpose utility in milk and meat production. Despite these advantages, RCC faces threats due to traditional management practices and limited adoption of scientific methods. This study investigates the knowledge, attitudes, and management practices of farmers rearing RCC in Anwara Upazila, Chittagong District, during January to July 2023. Data from 30 farmers, primarily male, aged 26–40, and engaged in diverse occupations, revealed a reliance on traditional management systems. Most farmers owned 6–10 RCC, provided minimal concentrate feed, and relied on naturally grown grasses for nutrition. Breeding was conducted through natural service, with an 80% conception rate and annual calving. Milk yield averaged 3.25 liters per day, demonstrating the breed's productivity under low-input conditions. Farmers employed basic hygienic practices, with limited use of antiseptics or disinfection. Disease occurrence was minimal, with only six cases reported over six months. Vaccination was rare, limited to Foot-and-Mouth Disease (FMD). Farmers cited RCC's resilience, low feed requirements, and adaptability as key advantages over other breeds. The findings highlight the need for targeted farmer training in modern cattle-rearing practices, improved veterinary services, and initiatives promoting RCC's economic and genetic value. Enhancing these aspects can bolster RCC conservation and provide socio-economic benefits, contributing to sustainable rural development in Bangladesh.

### INTRODUCTION

Bangladesh is an agro-based developing country where agriculture is considered as the backbone of the country and livestock is the integral part that playing an important role in the national economy (Islam *et al.*, 2022; Ferdous *et al.*, 2021). Livestock supports crop agriculture by preparing land for crop production, providing manure to enrich soil fertility, providing power for harvesting and threshing in addition with providing milk, meat, eggs and mutton supply to meet the demand of protein for the people. The livestock sub-sector accounts for 12% of the total agricultural GDP and supports approximately 20% of rural employment in Bangladesh (Sobur *et al.*, 2024). Apart from these, livestock plays an important role in earning foreign exchange and creating employment opportunities. Livestock contributes to the income, food supply, saving asset, family nutrition, transport, soil productivity, agricultural traction, agricultural variation and sustainable farming production, community and family employment, ritual purposes and social stratification (Gadekar, 2021; Arefin *et al.*, 2024). In livestock, cattle play an important role because of most

of the farmers (about 80 to 85 households) rear cattle as a source of income along with financial support during the crisis (Amin *et al.*, 2020). Livestock development is influenced by many factors such as technical, institutional and social knowledge, capital, outbreak of diseases, inputs, credit, guaranteed and profitable markets are playing an important role (Rich & Perry 2011).

In Bangladesh, out of total milk production about 90% share is from cattle (Uddin *et al.*, 2012). Among the native cattle breeds, Red Chittagong Cattle (RCC) stands out as a dual-purpose breed, valued for both dairy and beef production. RCC is known for its high conception rates, short postpartum heat period, greater milk fat content, and resistance to diseases and parasites (Halim *et al.*, 2010; Bhuiyan, 2008). Furthermore, the breed's adaptability to the harsh agro-ecological conditions in its habitat and its economic viability make RCC an important asset for poverty alleviation among smallholder farmers (Khan *et al.*, 2012).

Despite these advantages, RCC's full potential remains underutilized, primarily due to traditional rearing practices and limited access to scientific knowledge. The lack of

<sup>1</sup> Interdisciplinary Institute for Food Security, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

<sup>2</sup> Department of Microbiology & Hygiene, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

<sup>3</sup> Department of Animal Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

<sup>4</sup> Department of Dairy & Poultry Science, Gazipur Agricultural University, Gazipur-1706

<sup>5</sup> Department of Physiology, Bangladesh Agricultural University, Mymensingh-2200, Bangladesh

<sup>6</sup> Department of Pharmacology, Bangladesh Agricultural University, Mymensingh-2200, Bangladesh

\* Corresponding author's e-mail: [shafiqpharma@bau.edu.bd](mailto:shafiqpharma@bau.edu.bd)

awareness among farmers about modern management techniques has led to suboptimal productivity and a growing threat to the survival of this valuable genetic resource (Rahman *et al.*, 2014). Given the increasing demand for livestock products in Bangladesh and the challenges posed by climate change and resource constraints, enhancing the productivity and sustainability of RCC farming is critical for the future of the livestock sector. Research has shown that scientific advancements such as improved breeds, artificial insemination, disease prevention, and fodder cultivation can significantly boost cattle production (Ghosh *et al.*, 2015; Bhuiyan *et al.*, 2008). However, the adoption of these innovations remains limited due to farmers' lack of technical knowledge and access to resources.

To address this gap, it is essential to assess the current knowledge, attitudes, and management practices of RCC farmers. Such insights can inform the development of targeted interventions aimed at enhancing RCC productivity and improving the livelihoods of rural communities. In this context, the present study focuses on examining farmers' knowledge and attitudes towards RCC rearing in Anwara Upazila of Chittagong District, Bangladesh. The research aims to explore the existing rearing systems, identify challenges faced by farmers, and suggest possible improvements for sustainable RCC farming.

The objectives of this study are to assess the knowledge and attitudes of farmers regarding the rearing and management of Red Chittagong Cattle (RCC) in Anwara Upazila, Chittagong District. It aims to analyze the feeding, breeding, housing, and milking practices employed by these farmers, while also evaluating the disease prevention strategies and hygienic measures in place. Through this investigation, the study seeks to identify potential areas for improvement that can enhance the sustainability and productivity of RCC farming in the region.

## MATERIALS AND METHODS

### Study Design

This study employed a survey-based design to collect data from individuals with specific knowledge and experience related to Red Chittagong Cattle (RCC) rearing. The survey method was chosen for its effectiveness in capturing detailed information about attitudes, opinions, behaviours, and characteristics of a targeted population. As defined by Check and Schutt (2012), survey research involves “the collection of information from a sample of individuals through their responses to questions.” Creswell (2012) further describes survey designs as quantitative research methods used to gather data from a sample or population to address specific research objectives.

The study followed a structured approach, including designing and pre-testing the questionnaire, selecting a representative sample of RCC farmers, and administering the survey through personal interviews. Data collected through this design provided a comprehensive understanding of the management practices, knowledge, and challenges associated with RCC farming.

### Study Area and Period

In order to measure the existing level of knowledge on different aspects of Red Chittagong Cattle rearing and the attitude they possessed towards RCC rearing, the present study was conducted at Anwara upazila in Chittagong district. The study period was January to July 2023. Representative farms were selected to ensure the data collected aligned with the study's objectives. A random sampling method was employed. Based on information from the Upazila Livestock Office, a list of RCC-rearing farmers was obtained, from which 30 farmers were randomly chosen for the study.

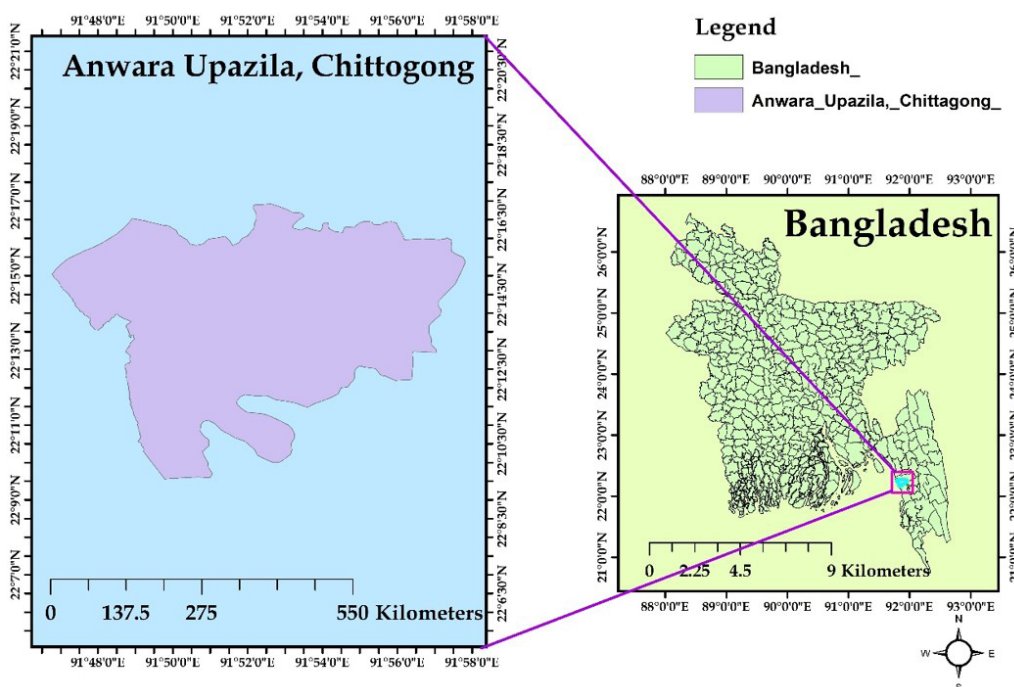


Figure 1: Map of the Study area

**Statistical Analysis**

The collected data were entered into MS Excel 2020, and various descriptive statistical measures, such as percentage distribution, range, mean, and standard deviation, were calculated. Simple tabular methods were employed to present and explain the data.

**RESULTS AND DISCUSSION**

**Personal Information of the Farmers**

**Ages**

Farmers rearing RCC were categorized into three age groups: 14–25 years, 26–40 years, and 41 years and above. Among the respondents, 26.66% were aged 14–25 years, 40% were 26–40 years, and 33.33% were 41 years and above. The majority of farmers (40%) belonged to the 26–40 years age group, indicating a predominance of middle-aged individuals in RCC farming (Table 1).

**Gender**

Out of the 30 farmers surveyed, 86.66% were male, and 13.33% were female, demonstrating a significant male dominance in RCC farming (Table 1).

**Occupation and Education**

All respondents identified RCC farming as their primary occupation, with 80% also engaging in agriculture, 10% in business, 6.66% in fish farming, and 3.33% in private service as secondary occupations. Educationally, 33.33% of farmers had a primary-level education, 23.33% attended junior secondary, 16.66% completed secondary school, 13.33% had higher secondary qualifications, and 10% pursued tertiary education. Notably, only 3.33% were illiterate, and the highest proportion had a primary-level education (Table 1).

**Table 1:** Personal information of the farmers

Category	Sub-category	Number of Farmers	Percentage (%)
Age	14–25 years	8	26.66
	26–40 years	12	40.00
	41 years and above	10	33.33
Gender	Male	26	86.66
	Female	4	13.33
Primary Occupation	RCC Farming	30	100.00
	Agriculture	24	80.00
	Business	3	10.00
	Fish Farming	2	6.66
	Private Service	1	3.33
Education Level	Illiterate	1	3.33
	Primary Education (Class 1–5)	10	33.33
	Junior Secondary (Class 6–8)	7	23.33
	Secondary Education (Class 9–10)	5	16.66
	Higher Secondary (Class 11–12)	4	13.33
	Tertiary Education	3	10.00

**RCC Farming Practices**

All farmers practiced indoor rearing combined with field grazing for their RCC. The majority (40%) of farmers owned 6–10 RCC, followed by 33.33% owning 1–5 RCC, 20% with 11–15 RCC, and only 6.66% owning 16–20

RCC. Farm structures were predominantly made of local materials such as bamboo, tin, wood, and mud. Tin and chatai houses were most common (56.66%), followed by straw houses (16.66%). All farmers allowed their cattle to graze freely for 4–5 hours daily.

**Table 2:** PRCC Farming Practices

Category	Sub-category	Number of Farmers	Percentage (%)
Rearing System	Indoor with field grazing	30	100.00
Number of RCC	1–5 RCC	10	33.33
	6–10 RCC	12	40.00
	11–15 RCC	8	20.00
	16–20 RCC	2	6.66
Housing	Tin and Chatai	17	56.66
	Straw	5	16.66
	Other materials (bamboo, wood, mud)	8	26.68

### Feeding Management

The feeding practices among RCC farmers were predominantly low-input and reliant on natural resources. All farmers (100%) allowed their cattle to graze on naturally grown green grasses from roadside areas, highlighting the dependence on freely available forage. Additionally, 60% of farmers provided rice bran as concentrate feed without supplementation, while 40% did not provide any concentrate feed at all. Regarding dry fodder, 86.66% of farmers offered less than 3 kg per animal per day, and only 13.33% provided 3–5 kg daily. These findings suggest a widespread use of traditional feeding practices, with limited adoption of enhanced feeding techniques, which could potentially improve

cattle productivity (Table 3).

Watering practices among farmers varied, but the majority ensured adequate hydration for their cattle. Most farmers (66.66%) watered their cattle more than four times daily, with 13.33% watering four times, 10% watering three times, and smaller groups watering two times (6.66%) or once daily (3.33%). Additionally, 93.33% of farmer's ensured water was available throughout the day, while 6.66% faced limitations in maintaining consistent water availability. These results demonstrate that while most farmers prioritize cattle hydration, a small number face challenges in maintaining optimal watering schedules, which could impact cattle health and productivity (Table 3).

**Table 3:** Feeding and watering practices of RCC cattle

Category	Number of Farmers	Percentage (%)	Sub-category
Concentrate Feeding	Provided rice bran (without supplementation)	18	60.00
	Did not provide concentrate feed	12	40.00
Roughage Feeding	Fed naturally grown green grasses	30	100.00
	Provided < 3 kg dry fodder per animal/day	26	86.66
	Provided 3–5 kg dry fodder per animal/day	4	13.33
Watering Times per Day	Watered more than 4 times/day	20	66.66
	Watered 4 times/day	4	13.33
	Watered 3 times/day	3	10.00
	Watered 2 times/day	2	6.66
	Watered 1 time/day	1	3.33
Water Availability	Water available throughout the day	28	93.33
	Water not available throughout the day	2	6.66

### Calf Management

All farmers relied on natural service (NS) for breeding, achieving an 80% conception rate and producing healthy calves annually. After calving farmers fed colostrum in varying amounts: 46.66% provided 2–2.5 liters daily,

26.66% provided over 2.5 liters, 16.66% fed 1.5–2 liters, and 10% fed 1–1.5 liters. Only 36.66% of farmers practiced ligating the navel cords of newborn calves. Among the farmers, 53.33% dewormed their calves within two weeks, while 46.66% did not.

**Table 4:** Management of RCC calf

Category	Sub-category	Number of Farmers	Percentage (%)
Colostrum Feeding	1–1.5 liters/day	3	10.00
	1.5–2 liters/day	5	16.66
	2–2.5 liters/day	14	46.66
	>2.5 liters/day	8	26.66
Navel Cord Ligation	Practiced	11	36.66
	Not Practiced	19	63.33
Deworming Within 2 Weeks	Practiced	16	53.33
	Not Practiced	14	46.66

### Milking Practices

Milk yield per cow ranged between 2.5–4 liters daily, with 36.66% producing 3–3.5 liters. All farmers followed a single daily milking routine. While 86.66% washed their hands before milking, only 13.33% bathed their cattle before milking, and 3.33% cleaned udders with antiseptic solutions.

### Diseases and Biosecurity Practices

Over six months, six disease cases were reported, including Foot-and-Mouth Disease (FMD) (2 cases), milk fever (2 cases), Lumpy Skin Disease (LSD) (1 case), and bloat (1 case).

### Vaccination

Only 3.33% of farmers vaccinated against FMD.

### Deworming

Eighty-six percent followed deworming practices.

### Isolation

Only 3.33% isolated sick animals.

Hygienic measures included limited use of footbaths (6.66%), sterilized water (3.33%), and farm disinfection (6.66%). Visitor access was allowed by 83.33% of farmers. Only 13.33% of farmers arranged treatment for sick animals, reflecting low disease occurrence and limited healthcare access.

### Discussion

The study was conducted in Anwara Upazila of Chittagong District, where 30 RCC-rearing farmers were randomly selected to assess their practices and challenges. Data were collected through pre-tested interview questionnaires and direct observation. The findings provide insights into the demographics, management practices, feeding, breeding, and disease control measures among the farmers.

The majority of farmers (40%) belonged to the age group of 26–40 years, indicating that RCC farming is primarily managed by middle-aged individuals. This aligns with findings from Halim *et al.* (2010), where most farm family members involved in livestock rearing were under 40 years. Regarding education, 33.33% of farmers had primary education, while 3.33% were illiterate. Education plays a critical role in adopting modern cattle management practices, as noted by Shiblee *et al.* (2017), with higher education levels correlating with better disease prevention and productivity. However, a lack of formal education and training among most farmers poses challenges to productivity and profitability.

RCC farming was the primary occupation for all farmers, with secondary occupations including agriculture (80%), business (10%), and fish farming (6.66%). Most farmers (40%) owned 6–10 RCC, suggesting a preference for small-scale operations. However, challenges such as limited access to resources, susceptibility to diseases, and lack of government support hinder farm expansion, as observed by Rahman *et al.* (2014).

Farmers predominantly relied on natural feeding systems, with 100% allowing cattle to graze on roadside grasses. Rice bran was the primary concentrate feed for 60% of farmers, and 86.66% provided less than 3 kg of dry fodder per day. These findings are consistent with Yasmin (2006), who reported RCC's adaptability to low-quality roughages. Studies by Asaduzzaman *et al.* (2019) further highlight the common practice of using low-grade feed in developing countries, which can reduce milk production if protein and energy needs are unmet. Despite this, RCC demonstrated resilience, requiring minimal feed while maintaining productivity.

Milk yields ranged from 2.5–4 liters per day, with an average of 3.25 liters, which is higher than the yields

reported by Habib (2011) and Hossain *et al.* (2006). RCC milk was also noted for its higher protein and lactose content, as confirmed by Kabir *et al.* (2022). However, all farmers practiced once-daily milking, potentially limiting milk production compared to more frequent schedules.

Breeding was exclusively through natural service (NS), with an 80% conception rate, producing healthy calves annually. Similar to findings by Hossain *et al.* (2006), farmers avoided artificial insemination due to concerns about semen quality and repeat breeding. Calf management practices, such as colostrum feeding and early deworming, were reasonably good, with 53.33% adhering to these practices, promoting calf health.

Disease incidence was notably low, with only six cases reported over six months. This low rate reflects RCC's resilience to local diseases and parasites, as highlighted by Ahmed *et al.* (2015) and Chowdhury *et al.* (2017). Vaccination was minimal, with only 3.33% vaccinating for Foot-and-Mouth Disease (FMD). According to Rahim and Sobur (2024), foot-and-mouth disease (FMD) was the most prevalent foot condition in adult cattle (86.13%), while abscess of the sole and white line were the most common in heifers (46.67%) and calves (13.33%). Hygienic practices, such as farm disinfection and sterilized water use, were limited but did not result in significant disease outbreaks. Pal *et al.* (2024) reported that 61% of affected cases of lumpy skin diseases were found in high mosquito or fly prevalence areas. This highlights the breed's adaptability to suboptimal management conditions.

Economic advantages of RCC farming include low feed and management costs, minimal disease occurrences, and reduced veterinary expenses. These factors make RCC farming highly cost-effective compared to other breeds. However, interventions are needed to enhance productivity through better feeding, training, and disease prevention practices.

RCC farming in Anwara Upazila demonstrates that this indigenous breed can thrive with minimal inputs, providing sustainable livelihoods for smallholder farmers. The findings underscore the need for targeted programs to train farmers in advanced management practices and improve access to veterinary and nutritional resources, ensuring the long-term conservation and productivity of RCC.

### CONCLUSION

The native breed Red Chittagong Cattle (RCC) is very important local breed in Bangladesh. Because this cattle is highly resistant to disease with minimum hygienic management and it has greater adaptability to environment. It has an ability to give an average of 3.25 litre milk per animal/day consuming less amount of feed. This breed is mainly dependent on natural food and feeds such as rice bran, rice straw, road-sided green grass, cultivated fodder etc. The main reasons for that the farmers in the study area prefer to rear RCC are- less disease occurrence, high conception rate (80%)

and calving every year. Besides these, it can be reared up with minimum management without modern facilitation. Thus the RCC farming is cost effective to the farmers of the study area and so they prefer to rear RCC than to other native breeds.

### Acknowledgement

Authors are acknowledge farmers for their support throughout my study.

### REFERENCES

- Ahmed, B., Biswas, P. K., Barua, M., Alim, M. A., Islam, K., & Islam, M. Z. (2015). Prevalence of gastrointestinal parasitism in cattle in Banskhalia Upazila, Chittagong, Bangladesh. *Bangladesh Journal of Advanced Veterinary and Animal Research*, 2, 484–488.
- Amin, M. R., Kabir, M. A., Hossain, S. J., Deb, G. K., Amanullah, S. M., & Afroz, F. (2020). Study on existing husbandry management practices of cattle rearing in selected areas of Bangladesh. *International Journal of Agricultural Economics*, 5(6), 279–285. <https://doi.org/10.11648/j.ijae.20200506.16>
- Arefin, K. S. A., Chowdhury, D., Islam, F. B., Devnath, B., & Sobur, K. A. (2024). Poultry farm waste management practices: Environmental challenges, health concerns, and farmers' perspectives in Chattogram, Bangladesh. *Journal of Bioscience and Environment Research*, 1(2), 32–38. <https://doi.org/10.69517/jber.2024.01.02.0006>
- Asaduzzaman, M., Amin, M. R., Sarkar, N. R., & Huque, K. S. (2019). Development of productive and reproductive potential of pregnant Red Chittagong cows through improved feeding in small-scale dairy farms. *Bangladesh Journal of Animal Science*, 48, 42–47. <https://doi.org/10.3329/bjas.v48i1.44558>
- Bhuiyan, A. K. F. H., Islam, S. S., Ashraf, A., & Habib, M. A. (2008). Research on characterization, conservation, and improvement of Red Chittagong cattle of Bangladesh. *Bangladesh Agricultural University Research Program*, 16, 13–21.
- Check, J., & Schutt, R. K. (2012). *Research methods in education* (pp. 27–45).
- Chowdhury, R., Sen, A., Kar, J., & Nath, S. K. (2017). Prevalence of gastrointestinal parasitism in cattle at Chandaniash Upazila, Chittagong, Bangladesh. *International Journal of Advanced Research in Biological Sciences*, 4, 144–149. <http://dx.doi.org/10.22192/ijarbs.2017.04.06.021>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.
- Ferdous, Z., Zulfiqar, F., Datta, A., Hasan, A. K., & Sarker, A. (2021). Potential and challenges of organic agriculture in Bangladesh: A review. *Journal of Crop Improvement*, 35(3), 403–426. <https://doi.org/10.1080/15427528.2020.1824951>
- Gadekar, B. B. (2021). *Livestock and agricultural development*. Lulu Publication.
- Ghosh, G. K., Khatun, M. A., & Baun, A. (2015). A comparative economic analysis of local and cross-breed cows in a selected area of Sirajganj district. *Sylhet Agricultural University*, 2(2), 267–273.
- Habib, M. A. (2011). *Analysis of Red Chittagong cattle genotype in nucleus breeding herd* (PhD dissertation). Department of Animal Breeding and Genetics, Faculty of Animal Husbandry, Bangladesh Agricultural University, Mymensingh, Bangladesh.
- Halim, M. A., Kashem, M. A., Ahmed, J. U., & Hossain, M. (2010). Economic analysis of Red Chittagong cattle farming system in some selected areas of Chittagong district. *Journal of Bangladesh Agricultural University*, 8(2), 271–276.
- Hossain, M. M., Bhuiyan, A. K. F. H., Faruque, M. O., & Dev, G. K. (2006). Characterization and distribution pattern of Red Chittagong cattle of Bangladesh. *Progressive Agriculture*, 17(1), 108–109.
- Islam, S., Ghosh, S., & Podder, M. (2022). Fifty years of agricultural development in Bangladesh: A comparison with India and Pakistan. *SN Business & Economics*, 2(7), 71. <https://doi.org/10.1007/s43546-022-00240-3>
- Kabir, M. A., Hossain, S. M. J., Shejuty, S. F., Amin, M. R., Das, D., Ratan, M. R. I., & Miah, M. (2022). Efficacy of a model of rearing Red Chittagong cattle to up-scale the livelihood of poor rural farmers. *Journal of Bangladesh Agricultural University*, 20(4), 425–432. <https://doi.org/10.5455/JBAU.87162>
- Khan, M. K. I., Miah, G., Huque, K. S., Khatun, M. J., & Das, A. (2012). Economic and genetic evaluations of different dairy cattle breeds under rural conditions in Bangladesh. *Livestock Research for Rural Development*, 24, 1–8.
- Pal, S. K., Sobur, K. A., Bose, P., Rahman, M. Z., Hossen, M. M., & Mowdood, S. (2024). Epidemiological investigation of lumpy skin disease in Jhenaidah district of Bangladesh. *Journal of Bioscience and Environment Research*, 1(1), 3–7. <https://doi.org/10.69517/jber.2024.01.01.0002>
- Rahim, M. A., & Sobur, K. A. (2024). Prevalence and Seasonal Patterns of Foot Affection in Cattle in Khulna District of Bangladesh. *Journal of Research in Veterinary Sciences*, 3(4), 140–140. <https://doi.org/10.5455/JRVS.20240717031613>
- Rahman, S., Begum, I. A., & Alam, M. J. (2014). Livestock in Bangladesh: distribution, growth, performance and potential. *Livestock Research for Rural Development* 26(10) 55–79.
- Rahman, S., Begum, I. A., & Alam, M. J. (2014). Livestock in Bangladesh: distribution, growth, performance and potential. *Livestock Research for Rural Development* 26(10) 55–79.
- Rashid, M. H., Bokhtiar, S. M., Khan, M. A. S., & Ali, M. S. (2023). *Bangladesh livestock research priorities* (pp. 978–984).
- Rich, K. M., & Perry, B. D. (2011). The economic and poverty impacts of animal diseases in developing countries: New roles, new demands for economics and epidemiology.

- Preventive Veterinary Medicine*, 101(3-4), 133–147. <https://doi.org/10.1016/j.prevetmed.2010.08.002>
- Shiblee, A. S., Halim, M. A., & Dipu, S. M. M. A. (2017). Profitability assessment of Red Chittagong cattle under different farming practices in Chandanaish Upazila of Chittagong district. *Bangladesh Journal of Veterinary and Animal Sciences*, 5(2), 33–39.
- Sobur, K. A., Bose, P., Rahman, M. Z., Hossen, M. M., Mowdood, S., & Nobil, M. A. (2024). Diseases and disease conditions of treated animals at Upazila Veterinary Hospital, Kaliganj, Jhenaidah, Bangladesh. *Journal of Bioscience and Environment Research*, 1(1), 16–20. <https://doi.org/10.69517/jber.2024.01.01.0004>
- Uddin, M. N., Uddin, M. B., Mamun, M., Hassan, M. M., & Khan, M. M. H. (2012). Small Scale Dairy Farming for Livelihoods of Rural Farmers: Constraint and Prospect in Bangladesh. *Journal of Animal Science Advances*, 2(6), 543-550.
- Uddin, M. M., Sultana, M. N., Ndambi, O. A., Alqaisi, O., Hemme, T., & Peters, K. J. (2011). Milk production trends and dairy development in Bangladesh. *Outlook on AGRICULTURE*, 40(3), 263-271. <https://doi.org/10.5367/oa.2011.0056>
- Yasmin, M. F. (2006). *Effect of supplementing concentrate on intake, digestibility, milk yield, and composition of Red Chittagong cows fed urea molasses straw-based diet* (M.S. thesis). Department of Animal Nutrition, Bangladesh Agricultural University, Mymensingh, Bangladesh.