



Original Research

Clinical disease patterns in cattle and goats attending Upazila Veterinary Hospital of Uzirpur, Barishal, Bangladesh

Salaudinn Yousup¹, Md. Abul Kalam Azad¹, Sharmin Sultana Royal², Md. Shamim Uddin², Md. Zaminur Rahman³, Farzana Islam Rume^{4,*}

¹ Department of Preclinical Sciences, Faculty of Veterinary Medicine and Animal Science, Habiganj Agricultural University, Habiganj-3300, Bangladesh

² Department of Paraclinical Sciences, Faculty of Veterinary Medicine and Animal Science, Habiganj Agricultural University, Habiganj-3300, Bangladesh

³ Department of Animal Production, Gono Bissobiddaloy, Savar, Dhaka-1344, Bangladesh

⁴ Department of Microbiology and Public Health, Faculty of Animal Science and Veterinary Medicine, Patuakhali Science and Technology University, Babuganj, Barishal-8210, Bangladesh



Article info

Article history

Received: 09 March 2026

Revised: 12 May 2026

Accepted: 25 June 2026

Published: 10 July 2026

Keywords

Clinical diseases
Retrospective study
Epidemiology
Veterinary hospital
Bangladesh

Abstract

Clinical disease surveillance provides essential epidemiological information for developing effective livestock health management strategies. This study investigated the occurrence and distribution of clinical diseases in cattle and goats presented to the Upazila Veterinary Hospital, Uzirpur, Barishal, Bangladesh. A retrospective study was conducted using hospital clinical records from July 2017 to August 2019. During the study period, the hospital registered 4,320 clinical cases involving different animal species. However, only cattle (n = 1,563) and goats (n = 1,345) were included in the present analysis, totaling 2,908 cases. Diseases were categorized into bacterial, viral, and other disease groups, and their occurrence was evaluated according to species, age, and sex. In cattle, bacterial, viral, and other diseases accounted for 17.47%, 3.52%, and 79.01% of clinical cases, respectively. The corresponding proportions in goats were 31.23%, 12.34%, and 56.43%. Colibacillosis (34.43%) and pneumonia (26.75%) were the predominant bacterial diseases in cattle, while pneumonia (44.52%) and tetanus (31.67%) predominated in goats. Foot-and-mouth disease (FMD) represented 80.00% of viral infections in cattle, whereas peste des petits ruminants (PPR) accounted for 88.55% of viral diseases in goats. Among the other disease categories, parasitic infestation was the most frequently diagnosed condition in both cattle (52.47%) and goats (35.84%). Young animals showed a higher occurrence of bacterial diseases, whereas adult animals exhibited a greater proportion of other disease categories. The findings demonstrate that parasitic infestations, pneumonia, FMD, and PPR remain the major health constraints affecting cattle and goats in the study area. Strengthening routine disease surveillance, strategic deworming, improved farm biosecurity, and effective vaccination programs are essential for reducing disease burden and improving livestock productivity in southern Bangladesh.

© 2026 Yousup et al. This is an open access article distributed under the **Creative Commons Attribution 4.0 International License** (www.creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

The livestock sector is an integral component of Bangladesh's agricultural economy, significantly contributing to food security, rural livelihoods, employment generation, and poverty reduction (Datta *et al.*, 2024). Cattle and goats, the primary livestock species, are reared by smallholder farmers and provide milk, meat, manure, hides, skins, and draft power. Beyond their economic contributions, these animals serve as crucial household assets and sources of financial security for rural communities (Sobur *et al.*, 2025a; Banda and Tanganyika, 2021). The livestock subsector plays a vital role in the national economy and ensures sustainable agricultural development (Moller *et al.*, 2023).

Despite continuous growth in the livestock sector, diseases remain a major constraint to improving animal productivity. Both infectious and non-infectious diseases reduce production efficiency through decreased milk yield, poor growth, reproductive disorders, increased treatment costs, and mortality, leading to significant

economic losses (Salaudinn *et al.*, 2025). Furthermore, several livestock diseases, including anthrax, brucellosis, rabies, and salmonellosis, are zoonotic and pose substantial public health concerns within the One Health framework (Sobur *et al.*, 2025b; Shaheen, 2022).

The prevalence of livestock diseases in Bangladesh is influenced by favorable climatic conditions such as high temperatures, humidity, seasonal rainfall, and flooding, which facilitate the survival and transmission of numerous bacterial, viral, and parasitic pathogens (Ali *et al.*, 2020). Poor housing, inadequate nutrition, insufficient biosecurity, unrestricted animal movement, and limited vaccination coverage further increase disease susceptibility among cattle and goats (Ahmed *et al.*, 2025; Salaudinn *et al.*, 2025).

Among infectious diseases, bacterial infections like colibacillosis, mastitis, pneumonia, hemorrhagic septicemia, abscesses, and tetanus are frequently encountered in veterinary practice and cause substantial production losses. Similarly, viral diseases, including foot-and-mouth disease (FMD), peste des petits ruminants (PPR), lumpy skin disease (LSD), and rabies, continue to affect livestock production despite ongoing vaccination efforts (Robi *et al.*, 2024; Sobur *et al.*, 2024; Pal *et al.*, 2024). Additionally, non-infectious disorders such as digestive diseases, reproductive disorders, metabolic diseases, nutritional deficiencies, poisoning, and traumatic injuries also

*Corresponding authors

Email address: farzanarume@pstu.ac.bd (Farzana Islam Rume)

doi: <https://doi.org/10.69517/jber.2026.03.02.0003>

ISSN: 3079-5346

contribute significantly to livestock morbidity and reduced productivity (Kang *et al.*, 2025).

Understanding disease occurrence and distribution is essential for developing effective prevention and control strategies (Hu *et al.*, 2025). Retrospective analysis of veterinary hospital records provides valuable epidemiological information on disease frequency and distribution by species, age, sex, season, and geographical location. Such information assists veterinarians and policymakers in identifying priority diseases, strengthening surveillance systems, improving resource allocation, and planning evidence-based disease control programs (Dinbiso *et al.*, 2025).

Retrospective and epidemiological studies have consistently documented the occurrence and distribution of clinical diseases affecting cattle and goats across various regions of Bangladesh. These investigations identified digestive, respiratory, bacterial, viral, and parasitic diseases as the predominant health problems, though their prevalence varies with geographical location, climatic conditions, husbandry systems, and management practices. Recent studies have further highlighted the emergence of transboundary and economically important diseases, such as LSD in cattle and PPR in goats, underscoring the dynamic nature of livestock disease epidemiology in Bangladesh. These regional and temporal variations emphasize the need for area-specific epidemiological investigations to support effective disease surveillance, prevention, and control strategies (Hossain *et al.*, 2023; Sultana *et al.*, 2022; Uddin *et al.*, 2022; Rahman *et al.*, 2020).

Therefore, this retrospective study investigated the occurrence and distribution of clinical diseases among cattle and goats presented to the Upazila Veterinary Hospital, Uzirpur, Barishal, Bangladesh. Specific objectives included determining the occurrence of major bacterial, viral, parasitic, and other clinical diseases; evaluating disease occurrence species, age, and sex; and identifying the predominant clinical conditions affecting livestock in the study area. The findings are expected to provide baseline epidemiological information to support disease surveillance, prevention, and control strategies for improving livestock health and productivity in southern Bangladesh.

2. Materials and Methods

2.1 Ethical approval statement

No ethical approval was required to conduct the study.

2.2 Study area

The study was conducted at the Upazila Veterinary Hospital in Uzirpur Upazila, Barishal district, southern Bangladesh (Figure 1). This hospital is the primary government veterinary healthcare facility for cattle, goats, and other livestock in the surrounding rural communities.

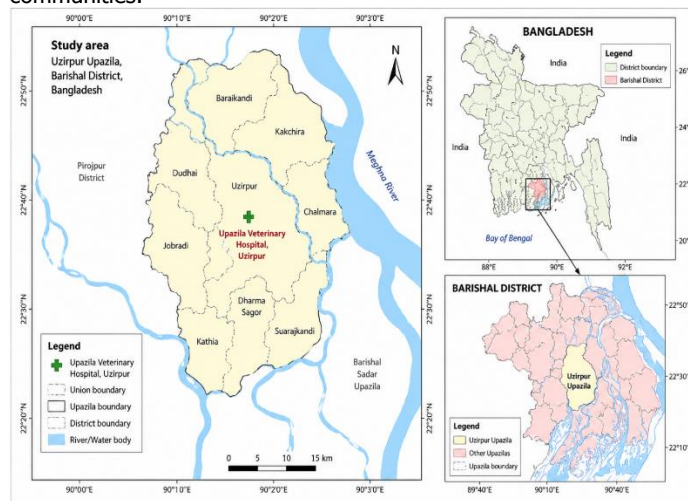


Figure 1. Map of the study area.

2.3 Study design and duration

A retrospective observational study was conducted using clinical case records maintained at the Upazila Veterinary Hospital, encompassing cases recorded between 1 July 2017 and 29 August 2019.

2.4 Study population

The study population comprised all cattle and goats presented to the veterinary hospital during the study period. A total of 2,908 clinical cases were included, consisting of 1,563 cattle and 1,345 goats. Clinical records of other animal species were excluded from this analysis.

2.5 Data collection

Clinical information was extracted from the official hospital disease register maintained by the veterinary hospital. For each case, the animal's species, age, sex, owner complaint, clinical history, tentative diagnosis, and disease category were collected. Data were carefully reviewed to eliminate duplicate or incomplete records before analysis.

2.6 Clinical diagnosis

Diagnosis of individual clinical cases was established by attending veterinarians based on case history, owner complaints, physical examination, clinical findings, and routine diagnostic procedures practiced at the veterinary hospital. Physical examination included inspection, palpation, percussion, auscultation, gait evaluation, limb manipulation, and needle aspiration, where appropriate. Specific diseases were diagnosed according to standard veterinary clinical criteria. Pneumonia was diagnosed based on respiratory signs including coughing, dyspnea, tachypnea, abnormal lung sounds, and fever. FMD was identified by characteristic fever, oral and pedal vesicles, erosive lesions, salivation, and rapid herd spread. Tetanus was diagnosed from classical clinical manifestations including generalized muscle rigidity, lockjaw, protrusion of the third eyelid, hyperesthesia, and tonic muscular spasms. Abscesses were confirmed through clinical palpation and needle aspiration.

2.7 Disease classification

Clinical cases were classified into three major disease categories: bacterial diseases, viral diseases, and other clinical conditions. The bacterial disease category included colibacillosis, pneumonia, mastitis, abscess, and tetanus, while the viral disease category comprised FMD, rabies, and PPR. The category of other clinical conditions included parasitic infestations, anorexia, non-specific diarrhea, accidental injuries, surgical conditions, bloat, anestrus, non-specific fever, conception failure, castration, and dog bite injuries. In addition, animals were categorized by age and sex for epidemiological analysis. Cattle were classified as young (<1 year) or adult (≥1 year), while goats were categorized as young (<6 months) or adult (≥6 months).

2.8 Statistical analysis

Data were entered into Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) for organization and validation. Descriptive statistical analyses were performed to calculate the frequencies and percentages of disease occurrence according to species, disease category, age, and sex. Results are presented using tables and graphical summaries.

3. Results

3.1 Overall occurrence of clinical diseases

A total of 2,908 clinical cases (1,563 cattle and 1,345 goats) were included in this retrospective study. Diseases were categorized as bacterial, viral, or other clinical conditions. Among cattle, bacterial diseases accounted for 17.47% (273/1,563) of all recorded cases, viral diseases for 3.52% (55/1,563), and other clinical conditions for 79.01% (1,235/1,563). In contrast, goats showed a comparatively higher occurrence of bacterial (31.23%; 420/1,345) and viral diseases (12.34%; 166/1,345), while other diseases accounted for 56.43% (759/1,345) of cases (Table 1).

Table 1. Overall occurrence of clinical disease categories in cattle and goats presented to the Upazila Veterinary Hospital, Uzirpur, Bangladesh.

Species	Total cases (n)	Bacterial diseases n (%)	Viral diseases n (%)	Other diseases n (%)
Cattle	1,563	273 (17.47)	55 (3.52)	1235 (79.01)
Goat	1,345	420 (31.23)	166 (12.34)	759 (56.43)

3.2 Occurrence of bacterial diseases

During the study period, five major bacterial diseases were identified (Table 2). In cattle, colibacillosis was the predominant bacterial disease, representing 34.43% of bacterial cases, followed by pneumonia (26.75%), abscess (25.27%), and mastitis (13.55%). No cases of tetanus were recorded in cattle. In goats, pneumonia was the most frequently diagnosed bacterial disease, accounting for 44.52% of bacterial infections, followed by tetanus (31.67%), colibacillosis (10.95%), mastitis (7.38%), and abscess (5.48%).

Table 2. Distribution of major bacterial and viral diseases in cattle and goats.

Disease category	Disease	Cattle, n (%)	Goats, n (%)
Bacterial diseases	Colibacillosis	94 (34.43)	46 (10.95)
	Mastitis	37 (13.55)	31 (7.38)
	Pneumonia	73 (26.75)	187 (44.52)
	Abscess	69 (25.27)	23 (5.48)
	Tetanus	0 (0.00)	133 (31.67)
	Total bacterial cases	273	420
Viral diseases	FMD	44 (80.00)	0 (0.00)
	Rabies	11 (20.00)	19 (11.45)
	PPR	0 (0.00)	147 (88.55)
	Total viral cases	55	166

3.3 Occurrence of viral diseases

Among cattle, FMD was the predominant viral disease, accounting for 80.00% of all viral infections, while rabies represented the remaining 20.00%. No cases of PPR were observed in cattle. In goats, PPR was overwhelmingly the most common viral disease (88.55%), whereas rabies accounted for only 11.45% of viral cases. No clinical cases of FMD were recorded in goats during the study period (Table 3).

Table 3. Major non-infectious and miscellaneous clinical conditions recorded in cattle and goats.

Disease	Cattle n (%)	Goat n (%)
Parasitic infestation	648 (52.47)	272 (35.84)
Non-specific fever	151 (12.23)	119 (15.68)
Anorexia	113 (9.15)	97 (12.78)
Bloat/Tympany	97 (7.86)	62 (8.17)
Non-specific diarrhoea	96 (7.77)	13 (1.71)
Anoestrus	58 (4.70)	19 (2.50)
Conception failure	34 (2.75)	5 (0.66)
Surgical conditions	12 (0.97)	27 (3.56)
Accidental injury	17 (1.37)	23 (3.03)
Dog bite	9 (0.73)	43 (5.67)
Castration	—	79 (10.41)

3.4 Occurrence of other clinical diseases

Other clinical conditions represented the largest disease category in both animal species. Parasitic infestation was the most prevalent condition, accounting for 52.47% of other diseases in cattle and 35.84% in goats. Among cattle, other recorded conditions included non-specific fever (12.23%), anorexia (9.15%), bloat (7.86%), non-specific diarrhoea (7.77%), anoestrus (4.70%), conception failure (2.75%), accidental injury (1.37%), surgical conditions (0.97%), and dog bite (0.73%). In goats, observed conditions included non-specific fever (15.68%), anorexia (12.78%), castration (10.41%), bloat (8.17%), dog bite (5.67%), surgical conditions (3.56%), accidental injury (3.03%), anoestrus (2.50%), and non-specific diarrhoea (1.71%) (Table 4).

Table 4. Age- and sex-wise occurrence (%) of major disease categories.

Species	Variable	Bacterial diseases (%)	Viral diseases (%)	Other diseases (%)
Cattle	Young (<1 year)	23.39	2.80	73.81
	Adult (≥1 year)	12.49	4.12	83.39
	Male	11.61	3.17	85.22
	Female	22.98	3.85	73.17
Goat	Young (<6 months)	41.69	11.76	46.55
	Adult (≥6 months)	21.78	12.87	63.35
	Male	35.06	12.08	52.86
	Female	26.09	12.70	61.22

3.5 Age-wise occurrence of diseases

Age-specific analysis demonstrated clear differences in disease occurrence between young and adult animals. In cattle, bacterial diseases were more common among calves younger than one year (23.39%) than adults (12.49%). In contrast, viral diseases occurred slightly more frequently in adult cattle (4.12%) than young cattle (2.80%). Other diseases predominated in adult cattle (83.39%). Similarly, young goats (under 6 months) exhibited a higher occurrence of bacterial diseases (41.69%) than adults (21.78%). Viral diseases were slightly more frequent among adult goats (12.87%) than young goats (11.76%). Other clinical conditions represented 63.35% of diseases in adult goats compared with 46.55% in young goats.

3.6 Sex-wise occurrence of diseases

Sex-related variations were also observed. Among cattle, females exhibited a higher occurrence of bacterial (22.98%) and viral diseases (3.85%) than males (11.61% and 3.17%, respectively). However, other diseases were more prevalent among males (85.22%) than females (73.17%). Conversely, male goats demonstrated a greater occurrence of bacterial diseases (35.06%) than females (26.09%). Viral diseases, however, were similarly distributed between males (12.08%) and females (12.70%). Other diseases accounted for 61.22% of female goat cases and 52.86% of male goat cases.

4. Discussion

This retrospective study provides comprehensive information regarding the occurrence and distribution of clinical diseases affecting cattle and goats presented to the Upazila Veterinary Hospital, Uzirpur, Barishal. The findings indicate that infectious diseases continue to pose a considerable challenge to livestock production, while parasitic infestations remain the most prevalent clinical conditions in both animal species. This is consistent with recent hospital-based epidemiological investigations conducted in Bangladesh (Datta et al., 2024; Hossain et al., 2023; Rahman et al., 2022).

The predominance of parasitic diseases observed in both cattle (52.47%) and goats (35.84%) reflects the endemic nature of gastrointestinal and ectoparasitic infections in tropical production systems. High environmental humidity, prolonged grazing on contaminated pasture, inadequate deworming practices, and poor sanitation likely contributed to this high disease burden. Similar observations have been reported from several regions of Bangladesh, where parasitic infestation consistently represents the leading cause of clinical presentation in ruminants (Sobur et al., 2024; Hossain et al., 2023).

Among bacterial diseases, colibacillosis was the most common diagnosis in cattle. The predominance of this disease in calves aligns with the well-established susceptibility of neonatal animals due to inadequate colostral immunity, immature immune responses, and poor hygienic management during the neonatal period. Previous studies conducted in Bangladesh likewise identified neonatal colibacillosis as a major cause of morbidity among calves (Haque et

al., 2022; Mohammed *et al.*, 2019). Pneumonia was the leading bacterial disease in goats and the second most common bacterial disease in cattle. Young animals were more frequently affected than adults, consistent with recent epidemiological investigations (Hossain *et al.*, 2023; Rahman *et al.*, 2022). Respiratory infections are favored by environmental stressors including overcrowding, sudden climatic fluctuations, transportation stress, poor ventilation, and concurrent parasitic infections, which collectively impair pulmonary defense mechanisms (Ackermann *et al.*, 2010).

Clinical mastitis occurred exclusively in adult females of both species, reflecting the physiological susceptibility of lactating animals. Although the prevalence observed in this study was relatively moderate, mastitis remains economically important because of reductions in milk yield, treatment costs, and premature culling. Improvement of milking hygiene and early detection programs could substantially reduce disease occurrence (Ruegg, 2017). Tetanus was recorded only in goats, particularly among young male animals. This finding may be associated with traditional management practices, including field castration performed under suboptimal hygienic conditions, allowing contamination of wounds by *Clostridium tetani*. Similar observations have been reported in goat production systems in Bangladesh and other South Asian countries (Rahman *et al.*, 2022). FMD constituted the majority of viral infections in cattle. Despite nationwide vaccination programs, sporadic outbreaks continue to occur because of incomplete vaccination coverage, unrestricted animal movement, and continual circulation of multiple viral serotypes. Regular vaccination together with movement control remains essential for disease prevention (Robi *et al.*, 2024; Naghi *et al.*, 2023).

In goats, PPR accounted for nearly 89% of viral diseases, confirming its continued importance as one of the most devastating infectious diseases of small ruminants in Bangladesh. Although mass vaccination campaigns have reduced disease incidence in many regions, inadequate vaccine coverage and seasonal transmission continue to facilitate outbreaks (Sobur *et al.*, 2024; Sultana *et al.*, 2022).

Age-related analysis demonstrated that bacterial diseases predominated among younger animals, whereas adult animals exhibited higher frequencies of chronic, reproductive, parasitic, and metabolic disorders. Younger animals possess immature immune systems, making them more susceptible to enteric and respiratory pathogens. Adult animals experience prolonged environmental exposure and physiological stresses associated with pregnancy, lactation, reproduction, and production, predisposing them to a wider range of clinical disorders (Akter *et al.*, 2024).

Sex-related differences observed in this study may largely reflect management practices rather than inherent biological susceptibility. Female cattle are generally retained longer for breeding and milk production, increasing their cumulative exposure to infectious and reproductive diseases. Conversely, male goats are commonly reared under semi-intensive systems and frequently subjected to castration, transportation, and marketing stress, factors that may increase their vulnerability to bacterial infections (Hossain *et al.*, 2023; Rahman *et al.*, 2022).

Overall, the disease pattern observed in the present investigation is broadly consistent with previous reports from other veterinary hospitals in Bangladesh. However, differences in disease frequencies likely reflect regional climatic conditions, management systems, vaccination status, and healthcare accessibility (Datta *et al.*, 2024; Sobur *et al.*, 2024; Hossain *et al.*, 2023). These findings emphasize the necessity for region-specific disease surveillance, routine deworming, strategic vaccination, farmer education, and improved herd health management to reduce disease occurrence and improve livestock productivity in southern Bangladesh.

5. Conclusions

This retrospective study identified the major clinical diseases affecting cattle and goats presented to the Upazila Veterinary Hospital, Uzirpur, Barishal, Bangladesh. Parasitic infestations were the most common clinical conditions in both species. Among bacterial diseases, colibacillosis predominated in cattle, whereas pneumonia and tetanus were the major bacterial diseases in goats. FMD was the most prevalent viral disease in cattle, while PPR predominated in goats. Disease occurrence varied by age and sex, with young animals more susceptible to bacterial infections and adults more frequently affected by reproductive and other chronic disorders. The findings highlight the need to strengthen routine disease surveillance, strategic deworming, farm biosecurity, and vaccination programs against FMD and PPR to reduce disease burden and improve livestock productivity. Further studies incorporating laboratory confirmation and risk factor analysis across different regions are recommended to support evidence-based disease prevention and control strategies in Bangladesh.

Acknowledgements

The author would like to acknowledge the Upazilla Livestock Office and Veterinary Hospital, Uzirpur, Barishal for their support during data collection.

Funding information

No specific funding or institutional support was received for the preparation of this manuscript.

Data availability

No new data were generated or analyzed in this article. Data sharing is not applicable to this article.

Informed consent statement

Informed consent was not required, as this manuscript does not report or involve any studies with human participants.

Conflict of interest

The authors declare no conflict of interest.

Authors' contribution

Conceptualization, data collection, formal analysis: Salauddin Yousup; **Data collection, methodology and manuscript preparation:** Md. Abul Kalam Azad and Sharmin Sultana Royal; **Literature review, manuscript formatting, and critical review of the manuscript:** Md. Shamim Uddin and Md. Zaminur Rahman; **Conceptualization, supervision, data interpretation, review and editing:** Farzana Islam Rume. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

References

- Ackermann MR, Derscheid R and Roth JA, 2010. Innate immunology of bovine respiratory disease. The Veterinary Clinics of North America: Food Animal Practice, 26(2): 215-228. <https://doi.org/10.1016/j.cvfa.2010.03.001>
- Ahmed E, Yousuf MA, Rahman H, Ahmed S, Ahmed S, Khatun R and Rahman MH, 2025. Health challenges in cattle farming: A study on common cattle diseases and disorders in a selective cattle farm of Bangladesh. Egyptian Journal of Veterinary Sciences, 56(11): 3017-3025. <https://doi.org/10.21608/ejvs.2025.337400.2505>

- Akter R, Soltana T, Nisa N, Rahman T, Islam MR, Hossain MM and Alam J, 2024. Retrospective case study of livestock diseases recorded at Fulbaria upazila veterinary hospital in Mymensingh district of Bangladesh. *Bangladesh Journal of Animal Science*, 53(4): 135-143. <https://doi.org/10.3329/bjas.v53i4.78848>
- Ali MZ, Carlile, G and Giasuddin M, 2020. Impact of global climate change on livestock health: Bangladesh perspective. *Open Veterinary Journal*, 10(2): 178-188. <https://doi.org/10.4314/ovj.v10i2.7>
- Banda LJ and Tanganyika J, 2021. Livestock provide more than food in smallholder production systems of developing countries. *Animal Frontiers*, 11(2): 7-14. <https://doi.org/10.1093/af/vfab001>
- Datta P, Behera B and Timsina J, 2024. Achieving sustainable development through agriculture-forestry-livestock nexus in Bangladesh: Synergies and trade-offs. *Agricultural Systems*, 215: 103854. <https://doi.org/10.1016/j.agsy.2024.103854>
- Dinbiso TD, Mekonnen AT, Olana TN, Ayana GM, Kelbesa KA, Deso HD and Berecha MS, 2025. Community knowledge, attitude, and practice, incidence of suspected cases, and epidemiological distribution of rabies in humans and animals in Southwest Shewa zone, Oromia, Ethiopia. *Frontiers in Veterinary Science*, 12: 1448448. <https://doi.org/10.3389/fvets.2025.1448448>
- Haque MA, Hossain MT, Islam MS, Islam MZ, Islam P, Shaha SN and Rafiq K, 2022. Isolation of multidrug-resistant *Escherichia coli* and *Salmonella* spp. from sulfonamide-treated diarrheic calves. *Veterinary World*, 15(12): 2870. <https://doi.org/10.14202/vetworld.2022.2870-2876>
- Hossain H, Parvej MM, Brishty KA, Ali M, Ahmed J, Hasan A and Khan MZ, 2023. Epidemiological assessment of some infectious and non-infectious diseases and disorders of cattle and goat at certain milk-pocket area of Sirajganj, Bangladesh. *Veterinary Sciences: Research and Reviews*, 9: 25-37. <https://doi.org/10.17582/journal.vsr/2023/9.1.25.37>
- Hu K, Li C, Yang X, Ou S, Zhang X, Xiao D and Yu M, 2025. From infectious diseases to chronic diseases: the paradigm shift of spatial epidemiology in disease prevention and control. *Frontiers in Public Health*, 13: 1698964. <https://doi.org/10.3389/fpubh.2025.1698964>
- Kang D, Lungu SE, Danso F, Dzou CF, Chen Y, Zheng X and Zhou G, 2025. Animal health and nutrition: Metabolic disorders in cattle and improvement strategies. *Frontiers in Veterinary Science*, 12: 1470391. <https://doi.org/10.3389/fvets.2025.1470391>
- Mohammed SAEM, Marouf SAEM, Erfana AM, El JKAHEH, Hessain AM, Dawoud TM and Moussa IM, 2019. Risk factors associated with *E. coli* causing neonatal calf diarrhea. *Saudi journal of biological sciences*, 26(5): 1084-1088. <https://doi.org/10.1016/j.sjbs.2018.07.008>
- Moller K, Eeswaran R, Nejadhashemi AP and Hernandez-Suarez JS, 2023. Livestock and aquaculture farming in Bangladesh: Current and future challenges and opportunities. *Cogent Food and Agriculture*, 9: 2241274. <https://doi.org/10.1080/23311932.2023.2241274>
- Naghi R, Bertran J, Spoldi E, Dark MJ, de Oliveira HH, Souza C and Maxwell EA, 2023. Multiple biliary duct hamartomas in a cat resulting in a hepatic mass: A case report. *Veterinary Medicine and Science*, 9(4): 1441-1445. <https://doi.org/10.1002/vms3.1175>
- Pal SK, Sobur KA, Bose P, Rahman MZ, Hossen MM and Mowdood S, 2024. Epidemiological investigation of lumpy skin disease in Jhenaidah district of Bangladesh. *Journal of Bioscience and Environment Research*, 1: 3-7. <https://doi.org/10.69517/jber.2024.01.01.0002>
- Rahman MH, Akther S, Ali MZ and Hassan MZ, 2022. Incidence of diseases in goats in Bangladesh. *Bangladesh Veterinarian*, 37(1-2): 14-20. <https://doi.org/10.3329/bvet.v37i1-2.59180>
- Robi DT, Mossie T and Temteme S, 2024. A comprehensive review of the common bacterial infections in dairy calves and advanced strategies for health management. *Veterinary Medicine: Research and Reports*, 2024: 1-14. <https://doi.org/10.2147/VMRR.S452925>
- Ruegg PL, 2017. A 100-Year Review: Mastitis detection, management, and prevention. *Journal of Dairy Science*, 100(12): 10381-10397. <https://doi.org/10.3168/jds.2017-13023>
- Salaudinn M, Khan MAA, Rahmati A, Hossain MG, Shimada M and Saha S, 2025. Impact of Viral Diseases on the Livestock Sector in Bangladesh. *Veterinary Medicine International*, 2025: 5492206. <https://doi.org/10.1155/vmi/5492206>
- Shaheen MN, 2022. The concept of one health applied to the problem of zoonotic diseases. *Reviews in Medical Virology*, 32(4): e2326. <https://doi.org/10.1002/rmv.2326>
- Sobur KA, Bose P, Rahman MZ, Hossen MM, Mowdood S and Nobi MA, 2024. Diseases and diseases conditions of treated animals at Upazila Veterinary Hospital, Kaliganj, Jhenaidah, Bangladesh. *Journal of Bioscience and Environment Research*, 1: 16-20. <https://doi.org/10.69517/jber.2024.01.01.0004>
- Sobur KA, Bose P, Rahman MZ, Muktaruzzaman M, Ghosh PP, Sultana P, Ahamed T, Khatun MM and Islam MA, 2025a. Sero-prevalence and risk factors of brucellosis in goats in Bangladesh: Rose Bengal plate test and enzyme-linked immunosorbent assay based approaches. *Pakistan Veterinary Journal*, 45(2): 852-858. <http://dx.doi.org/10.29261/pakvetj/2025.17>
- Sobur KA, Pal SK, Rahim MA and Bose P, 2025b. Exploring the management practices of Black Bengal goat husbandry in Jhenaidah district of Bangladesh. *Veterinary Sciences: Research and Reviews*, 11: 8-13. <https://dx.doi.org/10.17582/journal.vsr/2025/11.1.8.13>
- Sultana S, Pervin M, Sultana N, Siddique MP, Islam MR and Khan MAHNA, 2022. Identification of peste des petits ruminant's virus along with co-infecting diseases of goats in Bangladesh. *Journal of Advanced Veterinary and Animal Research*, 9(3): 463-470. <https://doi.org/10.5455/javar.2022.i615>
- Uddin MA, Islam MA, Rahman AKMA, Rahman MM, Khasruzzaman AKM, Ward MP and Hossain MT, 2022. Epidemiological investigation of lumpy skin disease outbreaks in Bangladeshi cattle during 2019-2020. *Transboundary and Emerging Diseases*, 69(6): 3397-3404. <https://doi.org/10.1111/tbed.14696>

Publisher's note

Genesis Publishing Consortium Limited pledges to maintain a neutral stance on jurisdictional claims shown in published maps and institutional affiliations.