

**PREVALENCE OF DIFFERENT DISEASES OF CATTLE IN  
SELECTED DAIRY FARMS AT RAIPURA UPAZILA,  
NARSINGDI**

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SELECTED DAIRY FARMS AT RAIPURA UPAZILA,  
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### CERTIFICATE

This is to certify that the thesis entitled “**PREVALENCE OF DIFFERENT DISEASES OF CATTLE IN SELECTED DAIRY FARMS AT RAIPURA UPAZILA, NARSINGDI**” submitted to the Department of Medicine & Public Health, Faculty of Animal Science & Veterinary Medicine, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTERS OF SCIENCE (M.S.) in MEDICINE**, embodies the result of a piece of bonafide research work carried out by **MD. SHAHADAT HOSSAIN**, Registration No. **14-05859** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, received during the course of this investigation has been duly acknowledged.

December, 2021  
Dhaka, Bangladesh

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*DEDICATED TO  
MY  
BELOVED PARENTS*

## **DECLARATION**

I declare that the thesis hereby submitted by me for the MS degree at the Sher-e-Bangla Agricultural University is my own independent work and has not previously been submitted by me at another university/faculty for any degree.

**Date: 31.08.2021**

**MD. SHAHADAT HOSSAIN**

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***The Author***

## CONTENT

<b>CHAPTER</b>	<b>TITLE</b>	<b>PAGE</b>
	<b>ACKNOWLEDGEMENTS</b>	<b>I</b>
	<b>CONTENT</b>	<b>ii-iii</b>
	<b>LIST OF FIGURES</b>	<b>Iv</b>
	<b>LIST OF TABLES</b>	<b>Iv</b>
	<b>ACRONYMS AND ABBREVIATIONS</b>	<b>V</b>
	<b>ABSTRACT</b>	<b>Vi</b>
<b>CHAPTER I</b>	<b>INTRODUCTION</b>	<b>1-5</b>
<b>CHAPTER II</b>	<b>REVIEW OF LITERATURE</b>	<b>6-27</b>
<b>CHAPTER III</b>	<b>MATERIALS AND METHODS</b>	<b>28-32</b>
	3.1. Description of study area	28
	3.2. Study period	29
	3.3. Geo-climatic condition of study area	29
	3.4. Farm visit and data collection	29
	3.4.1. Collected data	29-30
	3.4.2. Case classification	30
	3.4.3. General examination of dairy cattle	30
	3.4.4. Diagnosis of diseases	31-32
<b>CHAPTER IV</b>	<b>RESULTS AND DISCUSSION</b>	<b>33-44</b>
	4.1. Overall prevalence of different diseases in dairy cattle at Raipura Upazila	33
	4.2. Prevalence of different diseases in dairy cattle at Raipura Upazila	34
	4.2.1. Mastitis	34
	4.2.2. Anthrax	35
	4.2.3. Hemorrhagic septicemia (HS)	35-36
	4.2.4. Foot rot	36
	4.2.5. Pneumonia	36
	4.2.6. Lumpy skin disease (LSD)	36-37

## CONTENT (CONT'D)

<b>CHAPTER</b>	<b>TITLE</b>	<b>PAGE NO.</b>
4.2.7	Foot and mouth disease (FMD)	37
4.2.8.	Bovine ephemeral fever	37-38
4.2.9	Endoparasite	38
4.2.10.	Blood protozoa	38
4.2.11.	Bloat	38-39
4.2.12.	Diarrhea	39
4.2.13.	Acidosis	39
4.2.14.	Milk fever	39-40
4.2.15.	Uterine prolapse	40
4.2.16.	Retained placenta	40
4.2.17.	Postpartum anestrus	40-41
4.2.18.	Navel ill	41
4.2.19.	Hernia	41
<b>CHAPTER V</b>	<b>SUMMARY AND CONCLUSION</b>	<b>45</b>
	<b>REFERENCES</b>	<b>46-52</b>



## LIST OF FIGURES

<b>FIGURE NO</b>	<b>TITLE</b>	<b>PAGE NO.</b>
1	Study Area	28
2	Overall prevalence of different diseases in dairy cattle at Raipura Upazila	33

## LIST OF TABLES

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
1	Prevalence of different diseases of dairy cattle according to disease categories	35
2	Prevalence of diseases of dairy cattle according to breed	42
3	Prevalence of different diseases of cattle according to age	43
4	Prevalence of different diseases of dairy cattle according to season	44

## ACRONYMS AND ABBREVIATIONS

ABBREVIATIONS	FULL WORDS
<i>et al.</i>	And others/Associates
MS	Master of Science
>	Greater than
<	Less than
°C	Degree Celsius
%	Percentage
etc.	Etcetera
GDP	Gross Domestic Product
ml	Milliliter
DLS	Department of Livestock Services
HS	Hemorrhagic septicemia
BBS	Bangladesh Bureau of Statistics
mm	Millimeter
LSD	Lumpy skin disease
FMD	Foot & mouth disease
BEF	Bovine ephemeral fever
CBC	Complete blood count
TBD	Tick borne diseases

## ABSTRACT

The study was conducted to ascertain the prevalence of different diseases of dairy cattle in selected dairy farms at Raipura upazila, Narsingdi. It was conducted during the period from January to December, 2021. During the study period a total of 25 owners or attendants were interviewed and an entire of 200 cattle were examined and analyzed where 44 were identified with different diseases. Each of the clinical case was diagnosed on the basis of history, general examination, physical examination and clinical findings. The overall prevalence of different diseases was 22 % in study area. Among the clinical cases, mastitis 13.63% was the highest in all recorded cases. Furthermore, Lumpy Skin Disease 11.36%, Foot and Mouth Disease 9.1%, pneumonia 6.82%, bloat 6.82%, navel ill 6.82%, bovine ephemeral fever 4.54%, diarrhea 4.54%, endoparasitic infestation 4.54%, acidosis 2.27% and retained placenta 2.27% etc. were also commonly recorded. It was noted that local breed (68.18%) were highly susceptible for different diseases and disorders than cross breed (31.82%) cattle. In relation to age, >3 years aged cattle (43.18%) were found more infected with diseases as compared with 1-4 years aged cattle (31.82%) and <1year aged (25%) cattle. Among the seasonal cases, summer season (40.91%) had higher prevalence of different diseases of dairy cattle than rainy season (34.1%) followed by winter season (25%) in study area. From the study it was evident that dairy in study area cattle were infected with different diseases and caused a huge economic losses to farmers. Immunoprophylaxis and hygienic management should be initiated to curb the prevalence of common diseases in dairy cattle. So further epidemiological and laboratory study should be needed to confirm the etiology, prevention and control measures of the diseases in dairy cattle at study area.

## CHAPTER I

### INTRODUCTION

Bangladesh is an over populated, rural and agrarian country in the world where agriculture consisting of crop, fisheries, livestock and forest sub sector continues to be the largest sector of Bangladesh economy (Rahman *et al.* 2017). In Bangladesh not only human population density is high its livestock population is also high and near about 80% of population is employed in agriculture and livestock farming (BBS, 2008). The nation's economy is heavily reliant on agriculture. One of agriculture's four components, livestock, plays a crucial part in the economy of the country (Baset *et al.* 2002). In 2018–19, the livestock subsector contributed 1.47 % of the country's GDP, or 13.46 % of the agricultural GDP, with a GDP growth rate of 3.47 % for livestock (at constant prices) (DLS, 2019). Additionally, it contributes 13% of foreign currency to our national economy and employs 50% of rural residents part-time and 20% of them full-time (Khokon *et al.* 2017). It is estimated that about 20% of employment in the rural economy is directly associated with the livestock subsector, and this figure is about 50% when we consider indirect employment (GOB, 2018). The estimated number of livestock in Bangladesh is 4122.44 lakh (DLS, 2020).

The livestock sector plays an integral part of the rural economy of Bangladesh. About 37.6% of rural households in Bangladesh had at least one livestock in 2015 (IFPRI, 2015). Bangladesh has 24.5 million cattle, 80 percent of which are nondescript indigenous cattle kept by rural farmers (Habib and Bhuiyan, 2021). The number of bovine populations (cattle, buffalo, goat, and sheep) has increased since 1960, but their growth could not match the growth of the human population (Huque and Huda 2016). As a result, the per capita bovine population in Bangladesh declined from 0.4 in 1960 to 0.2 in 2018 (Iqbal *et al.* 2022). Livestock mainly ruminant is very important component of the mixed farming system which is practiced in Bangladesh from long time and performing multifarious functions such as provisions of food, draft power, transport, it also income foreign currency by exporting several by products such as hides & skin, bone etc. and now biogas is also producing from cattle dung. Bangladesh's total cattle population is estimated to be 243.91 lac (DLS, 2020).

Cattle are very important component of the mixed farming system practiced in this country and health of cattle is one of the many factors that conspire against

productivity of cattle production systems all over the world (Miranda, 2014). Bangladesh has one of the highest cattle densities, 145 large ruminants per km<sup>2</sup> compared with 90 for India, 30 for Ethiopia and 20 for Brazil (Rahman, 2017). Even if the cattle population per unit land area is high, their output is too low due to insufficient feed supply, poor genetic makeup, inadequate veterinary care provision, and a lack of scientific awareness in housing and management (Hossain, 2019). However, most of the animals in Bangladesh are weak and emaciated with non-satisfactory productive performance due to malnutrition and diseases. The average weight of local cattle ranges from 125 to 150 kg for cows and from 200 to 250 kg for bulls that fall 25-35% short of average weight of all-purpose cattle in India (Rahman *et al.* 2017). Besides, per capita income of Bangladesh is 2503 US dollar (The World Bank, 2022) and 49% of the total population of Bangladesh is malnourished (Rahman *et al.* 2017). Per capita requirement of protein cannot be fulfilled by our protein sources. If the livestock sector develops, it will be able to fulfill the existing requirement of protein for the country.

In rural areas, animals are reared under small holder traditional management system by the villagers. The favorable causes for the incidence of different diseases in Bangladesh are the management scheme of animals and geographical location (Lucky *et al.* 2016). Among the various constrains in the development of cattle, Animal diseases are the most important constraints to livestock development in Bangladesh and animal diseases alone constitute half of the causes of death of all livestock population (Ali and Hossain, 2016). The direct effect of the livestock diseases are the morbidity and mortality of animals and indirectly associated with market disruption of the livestock and livestock products, costs of prevention and control of diseases and impacts on human health especially zoonotic diseases and public health over the security, quality and safety of livestock products (Samad, 2019). The incidence of disease not only higher in the developing nations but in the absence of any national control and eradication program, is also increasing worldwide particularly in the Asian, African and Latin American countries (Mostari *et al.* 2020). Among the different constrains of cattle rearing, outbreak of several devastating disease is the major constrains causing economic loss and discouraging dairy farming in this country. It was reported that variation in different cattle breed, their sex and environmental factors greatly influence the disease prevalence in livestock of a

specific area and cattle are of no exception (Islam *et al.* 2014). Economic losses are attributable to decreased animal growth and productivity as well as frequent death of affected cattle. It has been reported that various types of disease and disorders has already been performed in various parts of the country (Samad *et al.* 2002, Rahman *et al.* 2012 and Karim *et al.* 2014). It has been reported the highest prevalence of common diseases in cattle were digestive disorders (45.14%) followed by parasitic diseases (30.64%) and infectious disease (9.49%) at Chittagong area (Badruzzaman *et al.* 2015). It has been reported that parasitic diseases (26.58%) in cattle were the highest in all observed cases in Sylhet, Bangladesh (Lucky *et al.* 2016). The highest prevalence of cattle diseases at Chittagong area was digestive disorders (47.05%) (Ullah *et al.* 2015). Among the clinical cases of cattle endoparasitic infestation 15.56%, FMD 8.89%, bovine ephemeral fever 7.78%, diarrhea/enteritis 7.78%, mastitis 4.44 %, black quarter 1.11 %, pneumonia 2.22 %, rabies 2.22%, myiasis 3.33%, ectoparasitic infestation 5.56%, bloat 6.67%, ruminal acidosis 4.44%, retention of placenta 2.22%, wound 2.22%, anoestrus 4.44%, dermatitis 3.33% and dermatophytosis 2.22% were also commonly recorded in Lalmohan, Bhola (Nahian *et al.* 2017).

Cattle usually suffer from a wide range of diseases including different systemic diseases, metabolic disorder and reproductive problems as well (Alam *et al.* 2018). Poor hygienic condition and inadequate managerial system as such bio-security, vaccination might be responsible for different disease and reproductive failure of cattle and goat (Hassan *et al.* 2007; Miazzi *et al.* 2007). Among the different diseases Food and mouth diseases (FMD) which is severe, highly contagious viral disease of livestock with significant economic impact. The disease affects cattle, swine, sheep, goats and other cloven hoofed ruminants. Furthermore, elephant and giraffe are susceptible to FMD (Kitching, 2005). Lumpy skin disease (LSD) is a potentially contagious viral disease in cattle, caused by the Lumpy skin disease virus (LSDV), which belongs to the family *Poxviridae* (Haque *et al.* 2021). It is a transboundary disease of cattle originated in Africa (Namazi and Tafti, 2021). In recent years it has emerged in different countries with a severe impact on production. In Bangladesh the first outbreak of LSD occurred in 2019 while disease manifested with high fever, skin nodules and edema. Reported morbidity rate was 10 to 20% with 1-5% mortality rate (DLS, 2019). Sharp decrease in milk production, long time treatment cost and

reproductive difficulties lead to widespread financial loss of farmers (Namazi and Tafti, 2021). Hemorrhagic septicemia (HS) is a highly fatal disease caused by *Pasteurella multocida* that often cause outbreaks in buffalo and cattle and thus is a major cause of production losses. It is one of the livestock diseases with the highest mortality, and despite available vaccines, outbreaks still occur (Shome *et al.* 2019). Bovine tuberculosis (bTB) is a bacterial disease of cattle mainly caused by *Mycobacterium bovis*, a member of *M. tuberculosis complex*. However, *M. orygis* has been reported to be the main causative agent of bTB in Bangladesh (van Ingen *et al.* 2012, Rahim *et al.* 2017). Mastitis is a multi-etiological and a very complex disease, which is defined as inflammation of parenchyma of mammary glands. It is characterized by physical, chemical changes in milk, and pathological changes in glandular tissues (Radostis *et al.* 2000). It adversely affects animal production, milk quality and the economics of milk production, affecting many countries, including developed countries and causes financial losses (Sharma, Maiti and Sharma, 2007). Most of the cases of mastitis caused by *Streptococcus agalactiae*, *Staphylococcus aureus* and other *Streptococcus* species and Coliforms. It may also associated with *Actinomyces pyogenes*, *Pseudomonas aeruginosa*, *Nocardia asteroides*, *Clostridium perfringens* and others like *Mycobacterium*, *Mycoplasma*, *Pasteurella* and *Prototheca* species, and yeasts (Chowdhury, 2020). Parasites are organisms that are metabolically and physiologically dependent on other organisms, their hosts, for survival and development (Sobecka, 2001). The distribution of parasitic diseases is throughout the world, but it varies in effects in the developed and developing world. The most impact of diseases is probably due to costs of control, particularly helminthic parasitosis of the developed world. Poor reproductive performance is a crucial production imitating issue. It has been reportable that reproductive disorders are accountable exceptional economic losses to the dairy farmers in Bangladesh (Talukder *et al.* 2005). The dairy industry's major goal is to provide milk for the consumer market. Most important constraint to achieve this goal is reduced fertility e.g., goats open for longer, more services per conception and higher incidence of reproductive problems, which in turn, contribute to reduced fertility (Dhaliwal *et al.* 1996). Amongst domestic farm animals the metabolic diseases achieve their greatest importance in dairy cows. In farm cows, the incidence of metabolic diseases is highest within the amount commencing at parturition and lengthening till the height of lactation is reached, and this susceptibleness seems to be relating to the extremely high turnover of fluids, salts and

soluble organic materials throughout the first a part of lactation (Islam *et al.* 2015). There exists a variety of problems in livestock sector of Bangladesh such as insufficient pasture land, lack of technical expert, insufficient supply of vaccine, lack of epidemiologic study and shortage of government employee in the field level and various diseases of different systems of animals. Infectious diseases cause a great harm in livestock. It has been estimated that about 10% animals die annually due to diseases (Ali and Khan, 2013). Disease also causes nutritional deficiency and disturbances in fertility (Mostari *et al.* 2020).

Dairy production has become a concerning issue in Bangladesh including Narsingdi district where livestock and its products are major sources of income of farmers (Bhuyan *et al.* 2021). Until the existence of diseases in a particular area is understood, it is difficult to plan systemic health program or formulate effective control strategies. Retrospective evaluation of clinical case records help to understand the predominant clinical problems and also their demographic and seasonal distribution in a particular area (Sarker *et al.* 2013). But there are no study performed on the prevalence of different diseases in dairy farms at Raipura upazila, Narsingdi, Bangladesh. So, present study was undertaken on the prevalence of different diseases in selected dairy farms in Raipura upazila, Narsingdi. This study may make a significant contribution to understand the different disease existence in dairy farms of Raipura upazila, Narsingdi.

**Objectives:**

- To enlighten the prevalence of different diseases in selected dairy farms at Raipura upazila, Narsingdi.
- To realize the health status of dairy cattle in selected dairy farms at Raipura upazila, Narsingdi.



## **CHAPTER II**

### **REVIEW OF LITERATURE**

Haque *et al.* (2021) conducted a study aimed to assess the current state of LSD and its management on several farms in the north-western region of Bangladesh. Data were obtained from two Upazilas in the Natore district (Natore Sadar and Baraigram) using a structured questionnaire. During the study period of 1 June to 20 December 2020, a total of 34 small farms and 87 animals were monitored. The OIE guidelines directed the diagnosis of LSD based on current clinical indicators. MS Excel and SPSS statistical software were used to evaluate all of the data. Morbidity, mortality, and case-fatality rates were found to be 64.70%, 2.94 %, and 4.53 % in Natore Sadar and 83.02 %, 3.77 %, and 4.55 % in Baraigram Upazilas, respectively. Female animals that were newly matured (2-4 years) were a larger prone to LSD infection (43.1%) than animals of other ages. A total of 34.43% illness was found in young bull cattle aged (2-4). Bull and heifer calves are also vulnerable populations, with reports of LSD infection leading to mortality. Limb swelling is a common clinical symptom, and LSD-positive young mature (2-4 year) cattle had the most significant rate (18.39%) of limb swelling. The farm hygiene practice is a critical determinant in the spread of LSDV, and a large proportion of cattle (48.27 %) infected with LSD were on farms with poor hygienic management, compared to good (01.14 %) and medium (01.14 %) hygienic management practices (26.43 %). Despite the fact that mosquito nets help prevent mosquitoes, most owners (91.17 %) did not use one in their cattle barn at night. More study is needed in Bangladesh to improve the clinical management of LSD, identify risk factors, and understand the molecular characteristics of diseases.

Mannan *et al.* (2021) designed a study to determine the prevalence and associated risk factors and molecular characterization of *Anaplasma* species in cattle from Chattogram division of Bangladesh. A total of 1680 blood (crossbred=455, local=1225) from cattle of selected hilly, coastal and plain areas of Chattogram Division, Bangladesh. The conventional microscopic examination using the Giemsa staining technique was considered to examine the samples. A total of 50 randomly selected blood samples (apparently positive as determined by microscopy) were tested using polymerase chain reaction (PCR) to confirm the disease. Partial genome sequencing (based on *16S rRNA* gene) and phylogenetic analyses were performed. Results demonstrated that a total of 8.21% of cattle (n=1680) were positive for

*Anaplasma marginale* infection. The prevalence of anaplasmosis in the hilly area was 9.33% followed by coastal area (9.00%) and plain area (5.83%). The prevalence of *Anaplasma* spp. was higher ( $P > 0.05$ ) in crossbred compared to indigenous cattle. The infection was significantly higher ( $P < 0.05$ ) in winter (11.09%) followed by rainy (7.13%) and summer (6.43%) season. Animals aged between 18-30 months were found to be more infected to anaplasmosis. The prevalence of anaplasma infection was higher in female animals compared to males. Amplification of *16S rRNA* gene showed 80% (40 out of 50 samples) of the samples were found positive for *Anaplasma marginale* infections.

Islam *et al.* (2020) conducted a cross-sectional survey in selected districts of Bangladesh to estimate the prevalence of bovine tuberculosis (bTB), and to identify the risk factors for bTB. 1865 farmed cattle from 79 herds randomly selected from five districts were selected for this study. The overall herd and animal level prevalences of bTB were estimated to be 45.6% (95% Confidence Interval [CI] = 34.3–57.2%) and 11.3 (95% CI = 9.9–12.8%), respectively, using the OIE recommended  $>4$  mm cut-off. The true animal level prevalence of bTB was estimated to be 11.8 (95% Credible Interval = 2.1–20.3%). At the herd level, farm size, bTB history of the farm and type of husbandry were significantly associated with bTB status in univariable analysis. Similarly, age group, sex, pregnancy status and parity were significantly associated with bTB at cattle level. However, in multivariable analysis only herd size at the herd level and age group and pregnancy status at the cattle level were significant. Compared to a herd size of 1–10, the odds of bTB were 22.8 (95% CI: 5.2–100.9) and 45.6 times (95% CI: 5.0–417.7) greater in herd sizes of  $>20$ –50 and  $>50$ , respectively. The odds of bTB were 2.2 (95% CI: 1.0–4.5) and 2.5 times (95% CI: 1.1–5.4) higher in cattle aged  $>3$ –6 years and  $>6$  years, compared to cattle aged less than 1 year. Pregnancy increased the odds of bTB by 1.7 times (95% CI: 1.2–2.4) compared to non-pregnant cattle.

Mostari *et al.* (2020) conducted a study to detect the prevalence of several diseases and to evaluate the disease condition of cattle population in the selected area with relation to age, sex and seasonal variation of cumilla district of Bangladesh. According to the case record, a total of 1145 sick animals were examined and 45 types of diseases were identified during this period. Disease diagnosis was made on

the basis of owner's statement, general examination, physical examination and clinical examination. The clinically observed cases in cattle were bacterial (12.66%; n=145/1145), viral (19.56%; n=224/1145), gynecological (15.46%; n=71/1145), Parasitic diseases (8.91%; n=102/1145), surgical affection (4.63%, n=53/1145), digestive disorder (16.9%, n=1145) and other clinical disorder (15.72%, n=180/1145) respectively. According to the study the highest prevalence was recorded by viral diseases followed by bacterial diseases, gynecological cases, parasitic diseases, surgical affection, digestive disorder and other clinical condition.

Fukushima *et al.* (2020) undertaken a study to investigate the incidence and prevalence of clinical mastitis, per acute mastitis, metabolic disorders, and peripartum disorders, and to examine factors affecting the prevalence of each disease in cows raised on a large dairy farm in a temperate climate in Japan. The present study was performed on a large commercial dairy farm with approximately 2500 Holstein cows. Data were collected from 2014 to 2018, and involved 9663 calving records for 4256 cows. The incidence rate on the farm was 21.9% for clinical mastitis, 10.4% for per acute mastitis, 2.9% for metabolic disorders, and 3.2% for peripartum disorders. The prevalence rates for clinical mastitis, per acute mastitis, metabolic disorders, and peripartum disorders were 28.0, 13.3, 3.7, and 4.0%, respectively. In all four diseases, the probability of time to occurrence for each disease was associated with parity and calving season ( $P < 0.05$ ). Regarding metabolic disorders and peripartum disorders, the probability of occurrence decreased during the first 10 days after calving.

Samad (2019) analyzed a study to detect the status on bovine health in selected area. Out of 137 different types of clinical cases recorded during the last 50 years, of which, calves affected with 27 (19.71%), adult cattle with 76 (55.47%) and both calves and adult cattle with 34 (24.82%) types of diseases and disorders. The highly statistical significant ( $p < 0.001$ ) percentage of clinical cases of cattle required medicinal treatment (81.19%) in comparison to surgical (10.03%) and gynaecological (GO; 08.78%) intervention. Results revealed that the parasitic diseases (fascioliasis 66.16%, humpsores 22.35%, gastro-intestinal (GI) nematodiasis 17.44%, ascariasis 12.17%, tick infestation 15.71%) and GI disorders (anorexia 14.90%, indigestion 6.15%) were highly prevalent as clinical cases in comparison to infectious diseases (anthrax 0.21%, BQ 0.92% and HS 0.45%) except FMD (10.13%) and mastitis (6.46%). Anestrus (3.04%), retained placenta (2.73%), repeat breeding

(2.73%) and pyometra (2.12%) were recorded as major gynaeco-obstetrical problems, whereas umbilical myiasis (10.11%), lameness (4.25%) and abscess (1.15%) that mainly required surgical interventions.

Shome *et al.* (2019) conducted a study to assess the seroprevalence of hemorrhagic septicemia (HS) in dairy cows in Assam, India. To assess the seroprevalence in the state of Assam, Northeast India, 346 serum samples from cows from 224 randomly selected households, from both urban and rural areas of three districts, were tested with a commercial ELISA. In total 88 cows were seropositive (25.4%), and indigenous cattle were significantly more seropositive (33.5%) compared to the crossbred cattle (18.5%) ( $p = 0.002$ ). Herd prevalence was 35.7%, and more rural farms (47.4%) were positive compared to the urban farms (23.6%).

Alam *et al.* (2018) conducted a study to define the occurrence of common diseases and disease conditions in cattle and goats at the Upazilla Veterinary Hospital, Debidwar under Comilla district. Data on various diseases were collected from the record book of hospital during April 2016 to March 2017. The total number of animals was 889, among which cattle were 637 (71.65%) and goats were 252 (28.35%). The presumptive diagnosis was performed based on general examination, physical examination, and clinical examination of animals, and microscopic examination based on common laboratory techniques. Based on clinical examinations, 14 different types of diseases and disease conditions were detected. In cattle (N=637; 71.65%), where FMD (14.44%, n=92), mastitis (6.59%, n=42), digestive disorders (19%, n=121), respiratory disorders (6.12%, n=39), parasitic infestations such as mixed infestation of both ecto- and endo-parasites (34.22%, n=218), acidosis (1.88%, n=12), myiasis (6.12%, n=39), corneal opacity (1.57%, n=10), protozoal diseases (1.26%, n=8), BQ (2.20%, n=14), milk fever (0.94%, n=6), reproductive disorders (4.87%, n=31) and others (0.75%, n=5) were detected. Age wise prevalence in young and adult were (38.62%, n=246) and (61.38%, n=391), respectively. Moreover, sex wise prevalence in male and female were (34.85%, n=222) and (65.15%, n=415) respectively. In goat, (N= 252; 28.35%) 11 different types of diseases and disease conditions such as PPR (12.30%, n=31), mastitis (2.38%, n=6), digestive disorders (19.84%, n=50), parasitic infestation (29.76%, n=75), respiratory disorders (15.08, n=38), myiasis (11.11%, n=28), corneal opacity (4.76%, n=12), acidosis (1.98%, n=5) protozoal diseases such as babesiosis, anaplasmosis (0.79%, n=2) and reproductive

disorders (1.59%, n=4), correspondingly. Sex wise prevalence in male and female goat were (44.05%, n=111) and (55.95%, n=141), respectively.

Talukder *et al.* (2018) conducted a study which was designed to have a comprehensive epidemiological data of the circulating diseases in Pabna cattle in Pubna and sirajgonj districts of Bangladesh. Two sites were selected for the study as the Nucleus Breeding Hard (NBH); which is located in the BLRI-RS, Baghabari, Sahjadpur, Siragjang and the community; consists of three villages of Bera upazila of Pabna district namely Khar-bagan, Hatail-aralia and Char-sabolla. The total cattle population was 576 (506 in the community and 70 in the NBH). A total of 965 clinical cases of cattle of different age and sex were diagnosed during the period from July, 2017 to June, 2018. The descriptive statistics suggested that endo-parasites (15.67%), FMD (27.51%), non-specific diarrhea (7.73%) and post-partum anoestrus (7.78%) are the most prevailing diseases in the community and endo-parasites (21.82%), foot-rot (15.15%), non-specific fever (7.27%), dermatochalasis (5.45%) and conjunctivitis (4.85%) are the most prevailing diseases in the NBH. Population data shows that there was an endemic outbreak of FMD in the community between March to May 2018 where almost 50% cattle were affected by the disease though calf morbidity was low (2.69%) but all the affected calf died. Non-specific diarrhea was more common in older individuals (14% in over 3 years old cattle) mostly in cows (14.2%) and occurred in summer (9.84%) and winter (8.81%) may be because of the ignorance of the farmers to supply clean water to their animals.

Asmare and Kassa (2017) conducted a longitudinal observational study on the incidence of mastitis in smallholder dairy cows in Sodo town and its surroundings, Ethiopia during the period from October 2015 to March 2016 with the aim of estimating incidence of mastitis in smallholder dairy cows, investigating potential risk factors associated with mastitis, and isolating mastitis-causing bacteria in milk of smallholder dairy cows. All the sixty-seven lactating cows from the nine smallholder dairy farms were registered for the follow up study. The incidence of mastitis at cow and quarter levels was followed up for six months. On top of that a questionnaire survey on smallholder dairy cow management and milking procedure was performed at the farms where the study animals resided. The results of this study revealed 50.7% (n = 34/67) prevalence of mastitis at cow and 29.1% (n = 78/234) at quarter levels. The total incidence risk was found to be 60.6% (n = 20/33). Based on bacteriological

examination, 90.8 % of the collected samples (n = 59/65) were found to be mastitis bacteria positive. Pathogenic bacteria belonging to five genera were involved in causing mastitis. Among these isolates, *Staphylococcus aureus* was the predominant mastitis pathogen (n = 23/65, 39 %) found in the study area followed by *Streptococci* species (n = 12/65, 20.3 %), Coagulase-negative *Staphylococci* species (n = 11/65, 18.6 %), *Escherichia coli* (n = 8/65, 13.6 %), and *Bacillus* species (n = 3/65, 5.0 %). The least mastitis pathogen isolated was *Corynebacterium* spp. (n = 2/65, 3.4 %). The influence of 22 potential risk factors on the incidence of mastitis was also investigated. Among others, late lactation stage, low daily milk yield, male milkers, dry cow therapy only at last milking of lactation were elicited to be highly risky for mastitis. On the other hand, milkers' work experience, herd size, teat distance from the ground, and milkers' skill of finding milk clots appeared to be not risky for the incidence of mastitis whereas, age greater than or equal to eight year, parity above or equal to six, and milk yield less than three liters per day were significantly associated with the prevalence of mastitis ( $p < 0.01$ ,  $p < 0.05$ ,  $p < 0.05$ , respectively). Although not significant, owners as milkers and late lactation stage had higher influence on the prevalence of mastitis ( $p = 0.058$  and  $p = 0.147$ , respectively).

Nahian *et al.* (2017) conducted a research to obtain the prevalence of diseases and disorders of cattle at Lalmohan Upazila, Bhola, Bangladesh. The study was performed from January to March, 2016. An entire of 90 sick cattle were examined and analyzed at the time of study where young 25.56%, growing 34.44% and adult 40%; local breed 78.89% as well as cross breed 21.11%. Each of the clinical case was diagnosed on the basis of history, general examination, physical examination and clinical findings. Among the clinical cases, endoparasitic infestation 15.56% was the highest in all recorded cases. Furthermore, FMD 8.89%, bovine ephemeral fever 7.78%, diarrhea/enteritis 7.78%, mastitis 4.44 %, black quarter 1.11 %, pneumonia 2.22 %, rabies 2.22%, myiasis 3.33%, ectoparasitic infestation 5.56%, bloat 6.67%, ruminal acidosis 4.44%, retention of placenta 2.22%, wound 2.22%, anoestrus 4.44%, dermatitis 3.33% and dermatophytosis 2.22% were also commonly recorded. It was reported that local breed (78.89%) were highly susceptible than cross breed (21.11%) cattle. In relation to age, adult cattle (40%) were found more infected with diseases and disorders as compared with calf (25.56%) and growing age (34.44%) cattle.

Rahman *et al.* (2017) undertaken a study of ruminant diseases to determine the prevalence and distribution of diseases based on species, age, sex, system affected, and seasonal variation at Jaintapur Upazilla, Sylhet during January, 2016 to December, 2016. A total of 791 diseased animals were examined where cattle, goat, sheep and buffalo were 538, 182, 17 and 54 respectively. Out of 538 diseased cattle, (38.66%) were male and (61.34 %) were female animals. Disease prevalence is high in oldage group (81.22%) than young age group (18.77%). Prevalence of diseases was high (34.76%) in summer season followed by (32.90%) in rainy and lowest (32.34%) in winter season. Gastrointestinal disease (63.38%) was seen highly prevalent among all groups of animals. Out of 182 diseased goats, (35.71%) were male and (97.25%) were female. Unlike cattle young aged group (70.33%) was highly susceptible to diseases than old age group (29.67%). The prevalence of disease was high in summer (36.26%) than other seasons. Out of 17 diseased sheep the male and female were (58.82%) and (41.18%) respectively. Disease prevalence was high in young (64.71%) than old (35.29%) age group. The disease prevalence was high in winter season (47.06%) followed by of summer (23.53%) and rainy (29.41%) season. Out 54 diseased buffalo (42.59%) were (57.40%) were female. The disease prevalence was high in old age group (79.63%) than that of young age group (20.37%). Highest prevalence of diseases was in summer season (51.85%).

Lucky *et al.* (2016) carried out a clinical study to find out the prevalence of clinically occurring diseases and the disorders in cattle and goats at the Sylhet Agricultural University area, Sylhet during January to December 2013. This clinical study was carried out on 775 clinical cases (553 cattle and 222 goats) based on the general, clinical, physical and microscopical examination along with common laboratory techniques. The clinically observed cases in cattle were (i) gynecobstetrical (15.37%;  $n=85/553$ ;  $P=0.038$ ), (ii) metabolic and nutritional (9.94%;  $n=55/553$ ;  $P=0.245$ ), (iii) bacterial and viral (26.22%;  $n=145/553$ ;  $P=<0.001$ ), (iv) parasitic (26.58%;  $n=147/553$ ;  $P=<0.001$ ), and (v) digestive diseases (21.88%;  $n=121/553$ ;  $P=0.008$ ). Similarly, in goats, the prevalences were found to be 14.41 ( $n=32/222$ ;  $P=0.041$ ), 15.76 ( $n=35/222$ ;  $P=0.078$ ), 30.63 ( $n=68/222$ ;  $P=0.001$ ), 23.87 ( $n=53/222$ ;  $P=0.020$ ), and 15.31% ( $n=34/222$ ;  $P=0.069$ ), respectively.

Biswal *et al.* (2016) conducted a study to ascertain the prevalence of ketosis in dairy cows in dairy herds, milksheds, and mixed population of milk cows selected randomly

in milkshed areas of Odisha state, India. The investigation was conducted in 280 private dairy herds with variable herd size of 10-15 cows comprising crossbred Jersey cows (CBJ), crossbred Holstein Friesian (CHF) cows, and indigenous local breeds. The analysis of urine (Rothera's test), milk (Ross test), and blood samples of 2760 test cows were conducted through qualitative assessment by Rothera's test and Ross test, respectively, for the presence of ketone bodies to screen the ketotic animals. Cut-points have been decided based on  $\beta$ -hydroxybutyric acid level ( $\geq 1.2$ -1.4 mmol/L) in milk. They noted positive cases of ketosis with a prevalence rate of 36.7% (1014/2760) entailing 27.2% in clinical ketosis and 9.6% in subclinical ketosis. The breed wise incident rate was recorded to be the highest (38.0%) in CBJs. The age-wise prevalence rate was found to be the highest (40.8%) in the age group of 5.5-6.5 years. The season wise prevalence rate in 5<sup>th</sup> calver was recorded to be the highest (38.6%) in summer season as compared to other seasons. The prevalence of ketosis was observed to be the highest at 56.7% on the first stage of lactation at the 1st month after 2 weeks. The incidence rates for clinical and subclinical ketosis were found to be 25.2%; 12.2%, 26.6%; 11.2% and 30.3%; 2.9% in CBJ, CHF and indigenous cows, respectively. The breed wise overall prevalence rate was recorded to be 38.0% in CBJ, 37.8% in CHF, and 33.2% in indigenous cows.

Sharma *et al.* (2016) undertaken a study to analyze the effects of various diseases on productive traits of cattle by using data collected from 504 livestock owners in Agra division of Uttar Pradesh, India. The analysis of the data (ANOVA) on milk reduction revealed the significant difference ( $p < 0.01$ ) in milk reduction due to various diseases. Over all milk reduction due to different diseases was 46.56%. Among all the diseases, FMD caused significantly higher milk reduction (63.40 %) followed by Milk fever (52.65%) and H.S. (52.22%). But the effect of blot/tympani was lowest (23.61%) as compared to other diseases. The analysis of the data (ANOVA) on weight reduction also revealed the significant difference ( $p < 0.05$ ) in weight reduction due to diseases. Over all weight reduction (%) in cattle due to both diseases diarrhea and pneumonia was (8.70%). Diarrhea had higher effect on weight reduction ((11.78%) as compared to weight reduction due to pneumonia (5.12%).

Sarder *et al.* (2015) conducted a study to investigate the prevalence of obstetrical disorders (ODs) of 975 dairy cows in relation to genotype, age, parity, housing



system, feed quality, rearing system, breeding systems and professional training of owners at Rajshahi, Bangladesh from the period 1 January, 2009 to 31 December, 2009. Extensive survey was conducted in 15 areas of Rajshahi and in each area 65 dairy cows were selected randomly. Individual farmers were interviewed to obtain information about ODs of dairy cows viz; abortion, dystocia, retained placenta, uterine and vaginal prolapse. Out of 975 cows, 117 animals were found to be affected by various ODs showing an overall prevalence of 12.00%. Among the ODs, retained placenta showed the highest prevalence (4.10%) followed by abortion (4.0%), dystocia (2.77%), uterine prolapse (0.66%) and vaginal prolapse (0.51%). The observation of genotype wise ODs in cows revealed that the maximum prevalence was in the Local × Friesian (15.97%), followed by Local (14.68%) and Local × Jersey (9.80%) while the minimum prevalence was in the Local × Sahiwal (5.55%). The age group (>48 months) showed highest prevalence (20.25%) of ODs while the lowest (6.66%) was recorded in < 24 months of age in cows. Parity-wise splitting of the data showed that the maximum prevalence of ODs was in the >5th parity (15.35%) and minimum in the 1st parity (6.15%) of cows. The traditional rearing and farming system revealed highest (17.26%) and lowest (8.51%) prevalence of ODs in cows, respectively. The quality of feed had effect on prevalence of ODs in dairy cows ( $P < 0.05$ ). The ODs were also increased in artificial inseminated cows (12.59%) than naturally service groups (11.90%). The training of farmers had significant effect among the non-trained and trained groups for the occurrence of ODs in cows. The study revealed relatively low prevalence of reproductive disorders in cows at Rajshahi compare to other regions of Bangladesh, might be due to better management practices adopted by the farmers and efficient veterinary services as well as awareness among farmers.

Badruzzaman *et al.* (2015) experimented a study to diagnose diseases were categorized as infectious diseases, parasitic diseases, digestive disorders, metabolic diseases, respiratory diseases and other diseases. According to their results, the prevalence of digestive disorders was the highest (45.14%) followed by parasitic diseases (30.64%), infectious diseases (9.49%), respiratory diseases (3.90%), metabolic diseases (3.18%) and other diseases (3.18%). Disease prevalence was highest in Cross-bred cattle (44.23%) followed by Red Chittagong cattle (28.46%) and Non-descript Deshi (27.31%). Female were more susceptible to diseases

(54.32%) than male cattle (45.68%). Disease prevalence varied according to seasons. Highest prevalence was recorded in summer season (37.49%) followed by rainy season (34.81%) and winter season (27.70%).

Ullah *et al.* (2015) carried out a study to assess the prevalence of several diseases and to evaluate the disease condition of cattle population at Chandanaish, Chittagong. Records of 306 clinical cases of cattle (120 dairy cows, 89 bulls and 97 calves) treated at the Chandanaish Upazila Veterinary Hospital during month December 2008 to February 2009 were analyzed to assess the importance of existing diseases. The recorded clinical cases were classified into seven major diagnostic groups, of which highest prevalence was recorded with Digestive disorders ( 47.05% ), followed by Parasitic infection ( 26.79% ), Infectious diseases( 7.84%),Respiratory disorder( 6.2% ),Surgical affection ( 5.22% ), Metabolic disorder ( 4.24% ), Ectoparasitic infection ( 1.96% ) and others( 0.65% ). The percentage of occurrence of major diagnostic groups of diseases constituted Infectious diseases (cows 41.66% ,bulls 33.33% and calves 25%), Parasitic diseases (cows 37.80%, bulls19.5% and calves 42.68%),Digestive disorders(cows41.66%, bulls35.41% and calves 22.91%), Respiratory disorders (cows 21.05%, bulls26.31% and calves 52.63%), Ectoparasitic infection (cows 16.66%,bulls 33.33% and calves 50%), Metabolic diseases(cows46.15%, bulls 38.46% and calves 15.38%) and Surgical affection (cows 50%, bulls 12.5% and calves 37.5%). Though the each of all the diagnostic groups of diseases is significant but the digestive disorder, parasitic and infectious diseases were the most pressing constraint for improvement of cattle in the Chandanaish Upzila.

Rahman *et al.* (2015) conducted an experiment to find out the occurrence of foot and mouth diseases in cattle in Magura district of Bangladesh. The study was performed at the Upazila Veterinary Hospital, Magura sadar, Magura, Bangladesh, during the period from July 2012 to June 2013. A total of 221 suspected cases were examined among them 83 case were FMD. The prevalence of FMD was 37.56%. The adult cattle (46.98%) were more susceptible compared to young (18.07%) and old (34.94%). There as significant seasonal variation in the occurrence of FMD ( $P < 0.05$ ) in the study area. The occurrence of FMD was higher in November (27.71). The male cattle (59.04%) were more susceptible than female cattle (40.96%). The higher prevalence (63.86%) of FMD was observed in indigenous breeds than crossed breed of cattle.

Ali *et al.* (2015) investigated the factors (age, sex, breed and season) affecting the occurrence of calf diseases. In this study 497 cases of 0 to 3 months of age from three different farms were investigated. Calf in Savar Dairy farm (n=249), Talbag Dairy Farm (n=85) and BAU Dairy Farm (n=163) were included from April 2011 to March 2012. The occurrence of diseases were classified on the basis of breed (Local and Cross), age ( $\leq 3$  weeks and  $>3$  weeks), sex (Male and Female) and season (Spring, Summer, Rainy and Winter). The overall diseases were diarrhoea (20.3%), anorexia (9.7%), fever (9.1%), navel ill (8.0%), malnutrition (7.7%), indigestion (6.7%), traumatic injury (5.4%), dysentery (5.0%), myiasis (4.6%), pneumonia (3.4%), alopecia (3.4%), atresia ani (3.2%), hernia (2.8%), constipation (2.6%), abscess (2.2%), conjunctivitis (2.2%), lameness (1.8%), FMD (1.2%) and blot (0.6%). The cases of diarrhoea was higher (20.5%) than that of other diseases. The occurrence of diseases was highly significant ( $p < 0.01$ ) in crossbred calves (77.3%) than that of local bred (22.7%). Cases of diseases were higher in male calves (51.7%) than that of female calves (48.3%) but the variation was insignificant ( $p > 0.05$ ). The effect of breeds on diseases were found significantly ( $p < 0.05$ ) higher in  $\leq 3$  weeks (55.1%) than that of  $> 3$  weeks of age (44.9%). The occurrence of diseases in calves was significantly ( $p < 0.05$ ) higher in rainy season (36.0%) followed by the summer (31.0%), winter (22.1%) and lowest in spring (10.9%).

Islam *et al.* (2015) conducted an investigation on the incidence of calf morbidity and mortality was conducted on 92 purposively selected CIG (Common Interest Group) dairy farms in Muktagacha upazila of Mymensingh district. A total of 119 calves from the farms were longitudinally followed from August 2014 to November 2014 for major health problems. Representative fecal samples from diarrhoeic calves were tested to identify gastro-enteropathogens associated with diarrhea by rapid detection test kit (Bio K 306). The overall incidence risk of morbidity and mortality were 56.17% and 6.29%, respectively. The most frequent disease syndrome was diarrhea with incidence risk of 34.82% followed by navel ill (7.22%) and pneumonia (6.29%). In addition, fever, arthritis, pica and foot and mouth disease were encountered. The main causes of death in calf were pneumonia (3.739%) and FMD (1.78%). A variety of infectious agents are implicated in calf diarrhea and co-infection of multiple pathogens is not uncommon. The overall prevalence of microorganisms associated with diarrhea was 69.2% in which *Clostridium perfringens* was the highest (38.5%)

within the first month of age. The prevalence of *Cryptosporidium* spp within first month of age was 7.7%. In this study, mixed infection with *Clostridium perfringens* and *Cryptosporidium* spp or Corona virus was found in 7.7% of diarrheic calves within 10 days of the age.

Munsi *et al.* (2015) carried out a study to determine the prevalence of clinical diseases and manifestations of cattle recorded and breed susceptibility to such diseases in different seasons during the period of January 2011 to December 2014. A total of 1558 cattle (where Pabna was 906 and Red Chittagong Cattle was 652) were included under this study. Diagnoses of clinical diseases and disorders were based on clinical history, clinical findings and different laboratory tests. Among the clinical cases, the highest prevalence was determined in case of ring worm (3.11%) followed by diarrhoea (1.86%), bovine ephemeral fever (1.08%), pneumonia (0.96%), alopecia (0.81%), mange (0.37%), tympany/bloat (0.69%), fever (0.64%), lameness (0.53%), arthritis (0.40%), mastitis (0.39%), malnutrition (0.26%) and posthitis (0.19%). Infectious diseases like foot and mouth disease (FMD), black quarter (BQ), anthrax and haemorrhagic septicemia (HS) were not found which may be due to regular vaccination and maintenance of strict bio-security. In case of breed, higher prevalence (12.09%) was found in Red Chittagong Cattle (RCC) compared to Pabna (11.13%). Among the seasonal cases, winter season (5.21%) had higher prevalence than rainy season (2.26%) followed by summer season (1.65%) in case of RCC, while summer season (3.85%) had higher prevalence than winter season (3.74%) followed by rainy season (3.30%) in case of Pabna.

Siddiki *et al.* (2015) conducted an investigation to determine the general clinical prevalence of diseases and disorders in cattle at the Upazila Veterinary Hospital, Chauhali, Sirajganj during the period from January to December 2014. A total of 2646 clinical cases on cattle were recorded and analyzed. Diagnosis of each of the clinical cases was made on the basis of owner history, clinical examination and common laboratory techniques. The clinical cases were divided into three groups on the basis of treatment required viz. (1) Medicinal (2) Gynaeco-obstetrical and (3) Surgical cases. Among the three types of cases, medicinal cases constituted the highest percentage (79.33%) in comparison to gynaeco-obstetrical (11.60%) and surgical (9.07%) cases. Among the medicinal cases, the highest cases were recorded with parasitic diseases (55.97%), followed by infectious diseases (24.21%)

and digestive disorders (10.34%). Other cases were general systemic states (3.91%), musculo-skeletal disorder (1.57%), skin condition (1.57%), metabolic diseases (1%), respiratory disorders (0.76%), sensory organ diseases (0.43%) and dog biting (0.24%). Among the gynaeco-obstetrical cases, repeat breeding (42.35%), anestrus (31.60%), orchitis (9.77%), posthitis (5.86%), dystocia (4.89%) and retained placenta (4.23%) were recorded as major gynaeco-obstetrical problems in cattle. Navel-ill (45%), myiasis (43.33%), abscess (6.25%) and fracture (3.34%) were recognized as the main disorders which required surgical interventions. Prevalence of diseases was high (39.38%) in summer season (March-June) followed by (34.73%) in winter (November-February) and lowest (25.89%) in rainy season (July-October).

Hassan *et al.* (2014) conducted a study to investigate the status of brucellosis in dairy cattle from five selected dairy farms in the Mohammadpur Beribadh area of Bangladesh. A cross-sectional study was carried out from October 2010 to March 2011 in which a total of 334 serum samples from cattle in five herds were screened by the Rose-Bengal plate-agglutination test (RBPT) and the positives were confirmed using an indirect enzyme-linked immunosorbent assay (I-ELISA). A structured questionnaire was used to collect epidemiological information describing the animals. Overall, 4.20% of the animals were RBPT positive, while subsequent confirmatory tests with I-ELISA revealed that the overall animal-level prevalence derived from the samples was 1.20%. Additionally, the prevalence was relatively higher in females than in males. A significant association was found between abortion, age of the animals, and the occurrence of brucellosis ( $p < 0.05$ ). Considering the overall low prevalence of brucellosis in the selected farms in the present study, a brucellosis eradication program for dairy farms using a test-and-slaughter policy would be possible.

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revealed that the overall animal-level prevalence derived from the samples was 1.20%. Additionally, the prevalence was relatively higher in females than in males. A significant association was found between abortion, age of the animals, and the occurrence of brucellosis ( $p < 0.05$ ).

Karim *et al.* (2014) carried out an investigation to determine the general clinical prevalence of diseases and disorders in cattle and goats at the Upazilla Veterinary Hospital, Mohammadpur, Magura during the period from January to December 2010. A total of 536 clinical cases (327 cattle and 209 goats) were recorded and analyzed. Diagnosis of each of the clinical cases was made on general examination, physical examination, clinical examination, microscopic examination and using common laboratory techniques. The clinical cases were divided into three groups on the basis of treatment required viz. (1) Medicinal, (2) Gynaeco-obstetrical and (3) Surgical cases. Among the three types of ruminant cases, medicinal cases constituted highest percentage (cattle 86.5% and goats 90.4%) in comparison to gynaeco-obstetrical (cattle 6.1% and goats 0.9%) and surgical (cattle 7.3% and goats 8.6%) cases. Among the medicinal cases, gastrointestinal nematodiasis (cattle 37.8% and goats 19.6%), diarrhoea (cattle 13.4% and goats 19.6%), fascioliasis (cattle 12.4% and goats 1.6%), paramphistomiasis (cattle 8.8% and goats 2.6%), fever (cattle 7.8% and goats 12.7%) were recorded major disease problems in cattle and goats. Among the gynaeco-obstetrical cases, retained placenta (cattle 30% and goats 50%) and repeat breeding (cattle 70% and goats 50%) were recorded as major gynaeco-obstetrical problems in cattle and goats. Abscess (cattle 45.8% and goats 5.6%), myiasis (cattle 20.8% and goats 20.8%), navel ill (cattle 12.5), urolithiasis (cattle 20.8% and goats 44.4%) and overgrown hoof (goats 33.3%) and gid disease (goats 5.6%) were recognized as the main disorders which required surgical interventions.

Parvez *et al.* (2014) carried out a study to determine the prevalence of clinical diseases and manifestations of goats and cattle recorded at TVH in CVASU during the period of January to December 2012. A total of 3090 clinical cases (goats 2778 and cattle 312) were registered. Diagnosis of these clinical diseases and disorders were based on clinical history, clinical sign and different lab test. Medicinal cases constituted highest percentage (goats 74.66% and cattle 66.35%) in comparison to surgical (goats 16.84% and cattle 24.04%) cases and gynae-obstetrical (goats 8.50% and cattle 9.62%) cases. Among the (1) medicinal cases, highest percentage was

recorded with the diseases of digestive system (goats 16.85% and cattle 20.83%) followed by parasitic diseases (goats 15.22% and cattle 12.82%), infectious diseases (goats 11.95% and cattle 12.18%), general systemic states (goats 7.91% and cattle 6.73%), disease of the respiratory system (goats 9.57% and cattle 4.16%), urinary system (goats 3.31% and cattle 1.28%), special sense organs (goats 3.99% and cattle 1.28%) and noninfectious diseases (goats 5.83% and cattle 4.17%). Among of the (2) surgical cases, general surgery (goats 11.77 and cattle 16.58%) was higher in percentage than special (goats 3.31% and cattle 3.20%) and orthopedic (goats 1.76% and cattle 3.85%) surgery. Among of the gynae-obstetrical cases, gynaecological disorders were recorded higher (goats 6.98% and cattle 8.33%) than obstetrical disorders (goats 1.51% and cattle 1.28%). Prevalence of clinical diseases and disorders were analyzed on the basis of age, sex, breed and season. P-value ( $P \leq 0.05$ ) was considered as significant.

Sarker *et al.* (2014) have undertaken a study to determine the occurrence of surgical disorders in five Upazila Veterinary Hospitals (UVH) in greater Pabna administrative district. A total of 33,584 sick animals were investigated and the overall occurrence of surgical disorders is 12.9%. The most common surgical affection is navel ill (25.8%) followed by myiasis (13.0%), foot diseases (11.3%), arthritis (8.8%) and teat obstruction (8.4%). Navel ill, umbilical hernia, arthritis, horn affections, urolithiasis and tail gangrene are more common in male than female. Foot diseases, myiasis, upward patellar fixation and hip dislocation are more common in female than male. Myiasis and arthritis are found more in summer, whereas foot diseases, urolithiasis and teat crack are more common in winter.

Bari *et al.* (2014) conducted a cross sectional study to measure the prevalence; and identification of risk factors associated with clinical mastitis in dairy cows at Patiya upazila under Chittagong district of Bangladesh from 20th July to 31st December, 2013. A total of 160 farms and households were selected and 634 cows were clinically examined for determining the prevalence of mastitis and identification of risk factors. The overall prevalence of clinical mastitis was found 8.36%. Mastitis prevalence in crossbred cows was significantly ( $P < 0.05$ ) higher (10.09%) than indigenous cows (4.26%). The prevalence of mastitis was also significantly higher ( $P < 0.05$ ) with advancing age (12.5%) and in 3<sup>rd</sup> lactation period (13.62%). The cows were more prone to mastitis during 1st month of lactation (17.53%). There was a

significant relationship( $P<0.05$ ) between prevalence of clinical mastitis and associated risk factors like general physical condition, herd size, frequency of dung removal, floor drainage quality and condition of floor. There was higher ( $P<0.01$ ) prevalence (33.67%) of mastitis in cows having history of peri-parturient disease compared to those not having such history.

Sarker *et al.* (2013) conducted a retrospective-epidemiological study of cattle diseases/disorders at Baghabari Milking zone of Bangladesh starting from June 2008 to May 2012. Out of 22066 cases, 73.95% and 17.16% diseases/disorders were recorded in cows and calves respectively. About 58.42%, 23.56% 12.48% and 5.54% cases were general and systemic, infectious, production and reproductive and surgical diseases/disorders respectively. The most common general and systemic diseases/disorders were fever (17.91%), anorexia (17.55%) and weakness (14.71%). Among infectious diseases, 78.2%, 7.02% and 6.32% respectively were mastitis, FMD and black quarter. The predominant production and reproductive diseases were milk fever (33.48%), repeat breeder (17.10%), retained placenta (14.27%), metritis (13.11) and anoestrous (11.44%). The most common surgical disorders were navel ill (46.9%), wound (20.19%), abscess (8.99%) and urolithiasis (8.67%). Statistically significant variation of diseases in different seasons was also noted.

Rahman *et al.* (2013) had undertaken an investigation to determine the clinical trend of reproductive diseases and disorders of cows at Sauria Government Veterinary Hospital, Manikgonj. More than 4 years (January 2007 to April 2011) data were collected from the patient register. The recording of animal description and owner's complaint, and diagnosis of diseases or disorders of cattle were performed by the Government Veterinary Surgeon. A total of 10652 cases were collected and examined of which 61.0% ( $n=6496$ ) were cattle. The lowest occurrence of diseases or disorders was in cattle at less than 1 year of age (10.44%;  $n=678$ ) and the highest occurrence was in cows at 5-8 years of age (43.39%;  $n=2814$ ). The occurrence of diseases or disorders that needed treatment by medicine expert was the highest (86.98%) and the occurrence of diseases or disorders that needed treatment by reproduction expert was the lowest (5.51%). Eight major reproduction related diseases and disorders were diagnosed among 5.51%,  $n=358$  registered sick cows. The highest proportion of cows was diagnosed as anoestrous (22.35%;  $n=80$ ) followed by retained placenta (20.39%;  $n=73$ ), repeat breeding (19.27%;  $n=69$ ), dystocia (13.69%;  $n=49$ ), utero-vaginal



prolapse (13.40%; n=48), pyometra (8.66%; n=31), abortion (1.95%; n=7) and ovarian cysts (0.28%; n=1). Eight major diseases and disorders were diagnosed among 7.50%, n=488 cattle registered with surgery related complaints. The highest proportion of cattle was affected with myiasis (23.98%; n=117) followed by hump sore (22.54%; n=110), lameness (19.08%;n=93), atresia ani (13.32%; n=65), umbilical hernia (10.45%; n=51), upward patellar fixation (5.33%; n=26), abscess (3.39%;n=19) and horn fracture (1.43%; n=7).

Noman *et al.* (2013) conducted a study to find out the prevalence of surgical affections of cattle in Aarong dairy area of Pabna. The prevalence of surgical affections of cattle was studied in four Upazilas of Pabna from December 2012 to May 2013. A total of 2390 cattle from different households were included and surgical affections were recorded. The overall prevalence was 44.3% in stall feeding system, among which surgical affections were more prevalent in Sujanagar Upazilas (13.3%), and the highest prevalent surgical affection was foot diseases (8.2%) followed by navel ill (6.3%),myiasis (4.6%), arthritis, hernia and wounds (3.6%). Overall prevalence of surgical affections was slightly higher in female cattle in comparison to males The prevalence of navel ill (11.3%), foot disease (11.1%), hernia (6.1%) and horn affections (4.9%) were found to be higher in male. Whereas, myiasis (5.9%),upward patellar fixation (2.8%) were found to be higher in females. There is significant ( $P<0.01$ ) difference in the prevalence of hernia, upward patellar fixation, horn affection, foot diseases and myiasis between male and female. It was also observed that cattle of 0-1 year was affected more frequently with surgical affections (18.7%) among which prevalence of navel ill (15.5%), hernia (8.3%),myiasis (5.4%) and foot diseases (5.3%) were higher. In addition, foot disease was more prevalent surgical affection in cattle of more than one year.

Islam *et al.* (2012) undertook a study to find out the prevalence and rational treatment of clinical mastitis in crossbred dairy cows at Potiya Upazila of the Chittagong district during July to October 2011. For diagnosis of clinical mastitis, California mastitis test (CMT), physical examination of udder and teat were performed. Out of 602 milking cows, 124 (20.6%) had clinical mastitis. Among 124 clinical cases 10.5% (n=63) were mild, 8.8% (n=53) were moderate and 1.3%(n=8) were severely affected. The prevalence of mild and moderate clinical mastitis differed significantly ( $P<0.05$ ) with severe clinical mastitis. The occurrence of clinical mastitis in the affected cows with

parity 1st-2nd, 3rd-4th and >4th were 48.3, 45.9 and 5.6%, respectively. The parity of 1st-2nd and 3rd-4th varied significantly ( $P < 0.05$ ) than parity of >4th. The occurrence of clinical mastitis at the lactation stages of 1-4, 5-8 and >9 months were 54.8, 33.0% and 13.7%, respectively. The percentages of clinical mastitis were 27.4, 47.6 and 25.0 at the milk yield of 6-10, 11-15 and >15 liters, respectively.

Maruf *et al.* (2012) carried out a study aimed to find out the prevalence of reproductive disorders in dairy cows in Potiya Upazila of Chittagong district of Bangladesh. The data on the prevalence of reproductive disorders on 1658 dairy cows from 202 dairy farm owners were collected by using questionnaires. Diagnosis of reproductive disorders was confirmed on the basis of history, clinical signs and examination of animals when necessary during December 2011 to April 2012. Thirteen major reproductive disorders were diagnosed. Overall prevalence of reproductive disorders were 23%, among of the disorders, occurrence of anoestrus was 5.1%, retained placenta 4.6%, metritis 4.4%, repeat breeder 3.7%, poor heat detection 1.6%, ovarian cyst 0.4%, dystocia 1.0% and pyometra was 0.2%. The prevalence of anoestrus, repeat breeder, metritis, poor heat detection, retained placenta and dystocia were higher in cows with low body condition score ( $BCS \leq 2$ ) than that with fair (2.5) and good ( $\geq 3-3.5$ ) body condition score.

Debnath *et al.* (2012) undertaken an investigation to determine the clinical trends of reproductive diseases and disorders of cows at three upazilas in the Mymensingh district with particular emphasis on vaginal culture during the period from April 2011 to March 2012. Records of reproductive cases were collected from official stock book from veterinary hospitals of 3 upazilas namely Fulbaria, Mymensingh sadar and Fulpur of Bangladesh. Microbiological investigation of vaginal swab samples ( $n = 20$ ) collected from the selective cows which were suffering from various reproductive disorders were also performed. A total of 7679 clinical cases were collected and among them 68 reproductive disorders in post parturient cows were identified. The overall occurrence of reproductive disorders in post parturient cows was 0.87%. The occurrence of reproductive disorders was higher in crossbred cows (1.27%) than that of indigenous cows (0.69%). The proportion of individual reproductive disorders in post parturient cows recorded were retained placenta (44.1%), pyometra (16.8%), endometritis (11.8%), metritis (10.3%), uterine prolapse (8.9%), vaginal prolapse (5.9%) and vaginitis (2.9%).

Azam *et al.* (2011) conducted a study to assess the status of amphistomiasis in cattle, 64 visceral and 360 faecal samples were collected from different areas of Joypurhat district during May 2009 to April 2010. Faecal and visceral sample examinations showed 70.8% and 90.6% infection with amphistomiasis, respectively. It was observed that age had a significant influence on the prevalence of amphistomiasis. In faecal samples, higher prevalence was observed in adult cattle (84.9%) followed by the young (77.3%) and lowest in calf (16.7%). On the basis of examination of visceral sample, females (93.8%) were found to be significantly more infected than male (89.9%) with the amphistome. The prevalence of amphistomiasis in crossbred cattle (90.9% in faeces and 93.9% in viscera) was significantly higher than indigenous cattle (62.2% in faeces and 89.8% in viscera). The calculated odds ratio implied that the crossbred cattle were 1.6 times (viscera) and 4.2 times (faeces) more affected than indigenous cattle. Prevalence rate was higher in rainy season (79.2% in faeces and 95.5% in viscera) followed by winter (68.3% in faeces and 90% in viscera) and summer (65% in faeces and 86.4% in viscera) season, but with no significant effect on the prevalence of amphistomiasis. Feeding habit had significant effect on the prevalence of amphistomiasis. Pasture grazing cattle (82.5%) were more (2.9 times) affected than stall feeding cattle (59%).

Islam *et al.* (2011) assessed the prevalence and seasonal variations of intestinal schistosomiasis in association with age, sex, breed and rearing system of cattle and goats in different districts of Bangladesh. Fecal samples from 240 cattle and 146 goats were examined. *Schistosoma* eggs were found in 47.5% cattle and 43.84% goats. Two species of schistosomes were identified. No mixed infection was recorded. Prevalence of *Schistosoma indicum* was higher in cattle (42.5%) than in goats (34.25%) whereas goats (9.59%) were more susceptible to *Schistosoma spindale* infection than cattle (5.0%). Age, sex, breed, rearing system and topography of the country had significant ( $P < 0.01$ ,  $P < 0.05$ ) effect on the prevalence of schistosomiasis among cattle, whether only seasons of the year had significant ( $P < 0.01$ ) effect on schistosome prevalence among goats of Bangladesh. Higher infection rate was found in rainy season, in older age group, in males, in local breeds (cattle) and animals reared under semi intensive system. Prevalence was highest in the Rangpur district and lowest in the Dhaka district.

Paul *et al.* (2011) conducted a study to investigate the Epidemiology of *Paramphistomum* infection in cattle; faecal samples from 360 cattle were collected from individual areas of the Sirajgonj district from March 2009 to April 2010. One hundred and ninety one animals(53.1%) were infected with single or multiple species of *Paramphistomum*. Age of animals significantly ( $P<0.05$ )influenced the prevalence of Paramphistomiasis. Older animals suffered (60.3%) more than growing (44.4%) and young (54.0%) ones. Older animals were 1.94 times more susceptible than growing animals. Furthermore, females were more (59.5%; 1.79 times) susceptible to *Paramphistomum spp.* than males (45%). Breed has also significant( $p<0.05$ ) effect. The prevalence of Paramphistomiasis was higher ( $p<0.05$ ) in crossbred (61.8%) animals than that of local (49.2%) cattle. The crossbreed cattle were 1.7 times more susceptible than indigenous cattle. The prevalence of Paramphistomiasis in cattle varied ( $p<0.05$ ) depending on the season of the year; being highest in the rainy season (60.8%) followed by the summer (50%) and lowest during the winter (48.3%).

Sarder *et al.* (2010) conducted a study to find out the prevalence of reproductive disorders of crossbred cows in Rajshahi district of Bangladesh. The incidence of reproductive disorders (RD) of dairy cows in relation to breed, age, parity, body weight and body condition of 500 dairy cows belonging to F (Friesian) x L (Local; n=342), SL (Sahiwal) x L ((Local; n=91), SL x F x L; n=67 from 10 different upazilas of the Rajshahi district were studied during January to December, 2007. Study results concluded that the incidence of stillbirth, retained placenta, dystocia and repeat breeding were height in SL x F x L cows and lowest in F x L cows. The incidence of abortion, metritis, cystic ovary, vaginal prolapse, uterine prolapse, retained placenta, dystocia, anoestrus and repeat breeding were higher in more than 8 years old cows and lower in 4-6 aged cows.

Thakur *et al.* (2010) conducted a study on 440 dairy cattle in six organized dairy farms in the state of Himachal Pradesh, India using tuberculin skin testing (TST) to determine the prevalence of bovine tuberculosis. An overall animal prevalence of 14.31% (63 of 440 animals) and a farm prevalence of 16.67% (1 of 6 farms) were recorded in 6 dairy farms by the TST. Of the six dairy farms studied, one of the farms showed prevalence of 34.42% (63/183).

Islam *et al.* (2015) was undertaken a retrospective epidemiological study at the Adamdighi Veterinary Hospital, Bogra from January 2012 to December 2014 to determine the occurrence of cattle diseases. According to the diseases register, a total of 12403 sick animals were examined and 7208 cases of cattle diseases were identified. About 44.7% were parasitic, 37.8% general systemic affections, 14.2% infectious, 1.3% reproductive, 1.2% poisoning and 0.8% metabolic diseases. The common diseases were worm infestation (34.2%), pneumonia (8.7%), foot and mouth disease (2.5%), mastitis (1.9%), black quarter (0.6%), haemorrhagic septicaemia (0.5%), simple indigestion (11.9%), diarrhoea (11.7%), fever (7.5%), navel ill (2.6%), bloat (2.0%), calf scour (1.7%), organo-phosphorus poisoning (1.2%), retained placenta (0.8%) and abortion (0.6%). About 2397 cases (33.3%) were in male and 4811 cases (67.7%) in female. Animals aged between 1-3 (A2) years had highest occurrences (34.3%) of diseases but lowest 17.1% occurrences were in cattle between 8-15 years (A4) of age. Disease occurrence was higher (37.3%) in summer (March – June) followed by (32.5%) rainy (July – October) and lowest (30.3%) in winter season (November – February). Gastrointestinal diseases (n = 3665) were most common but lower cases of hematopoietic system were identified (n = 107).

Alam *et al.* (2016) carried out a study of clinical detection of foot and mouth diseases in the cattle in Kapasia upazila under Gazipur district during from February 2011 to January 2012 and identifying the potential risk factors associated with the studies in Kapasia, Gazipur. A total of 315 infected cattle of different age, sex were examined in the Upazila veterinary development center of Kapasia in Gazipur district. Total 86 (27.30%) cattle were infected with FMD on the basis of clinico-epidemiological determinants. The effect of season, Breed, Age, and sex of cattle on the incidence of the disease was discussed. It was observed that rural farming system (30.43%) was more susceptible than intensive farming (21.30%) system of cattle. Old animals (33.15%) were more susceptible than adult (21.81%) and young (15.71%). The prevalence of disease was found significantly ( $P < 0.05$ ) higher in male (33.65%) than in female (24.17%). It was observed that local breed cattle (35.48%) were more susceptible than cross-breed cattle (15.50%). Seasonal variation of the disease was significant in the study area. The infection was less in summer (11.63%) and increasing in rainy season (25.58%) but gradually increased in late period of winter season (62.80%).

Islam *et al.* (2017) conducted a study to investigate the prevalence of *T. foetus* in cattle and associated risk factors. A total of 200 samples from 183 cows and 17 bulls were collected from Veterinary Teaching Hospital, Bangladesh Agricultural University; Mymensingh district and Regional station of Bangladesh Livestock Research Institute in Shahjadpur, Sirajgonj during the period from March 2015 to May 2016. Among 200 cattle, 65 were indigenous, 100 were Holstein cross and 35 were Shahiwal cross bred. The collected samples were vaginal and uterine washing, aborted foetus and semen. The samples were collected from vagina and uterus by flushing with phosphate buffer solution by artificial insemination tube connected with 20 ml syringe. The samples were examined for *T. foetus* under microscope. The samples were examined on the same day of collection. Out of 200 samples examined, 3 (1.5%) were found infected with *T. foetus* protozoa. Among these 3 positive cases of tritrichomoniasis, one was detected in aborted foetal materials and other two were detected in vaginal washings. Therefore, bulls represent zero prevalence of *T. foetus*. During the study period the examined animals were categorized into three age groups viz. 40, 60 and 100 cattle for below 3 years, over 3 years to below 6 years and over 6 years to ten years, respectively. The prevalence rate was found in adult cattle over 6 years (>6–10 years) was 2.00%, over 3 years (>3–6 years) was 1.66% and below 3 years (<3 years) was 0%. In the study, prevalence rate of cross bred animals were 2.22% and no infection was found in indigenous bred.

## CHAPTER III

### MATERIALS AND METHODS

#### 3.1. Description of study area

Narsingdi District is a district in central Bangladesh. It is located 50 km north-east of Dhaka, capital city of Bangladesh. It is a part of the Dhaka Division. Narsingdi is bordered by Kishoreganj in the north and north-east, Brahmanbaria in the east and south-east, Narayanganj in the south and south-west and Gazipur in the west.. The district is divided into six upazilas. Among them I chose five different places of Raipura upazila for my research work. They were Horipur, Mohismara, Nobiabab, Chanderkandi & Olipura. To determine the prevalence of different disease in dairy farms the data were collected from different dairy farms of Raipura upazila (Figure 1).

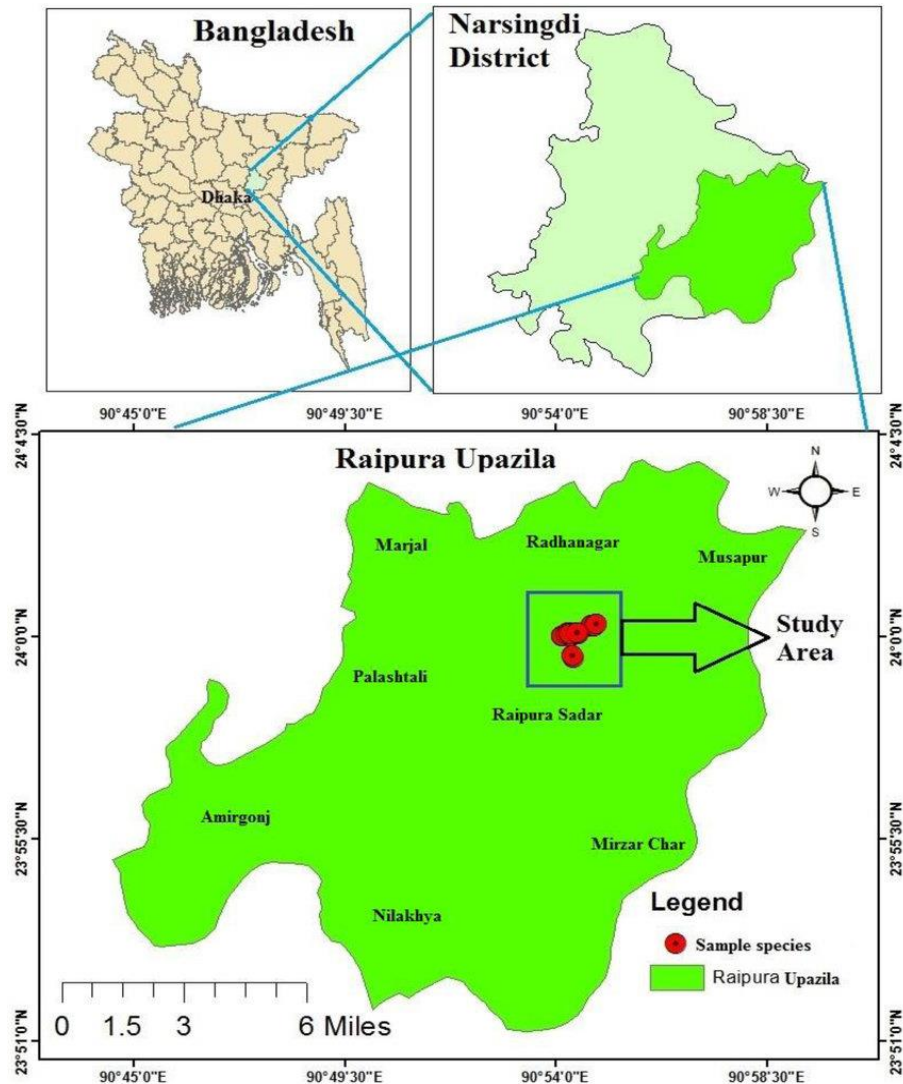


Figure 1. Study area

### **3.2. Study period**

The data were collected over a period of one year from January, 2021 to December, 2021 to cover all three prominent seasons in Bangladesh, namely, the winter (November to February), the summer (March to May) and the rainy season (June to October).

### **3.3. Geo- climatic condition of study area**

Raipura upazila is located at 23°58'N, 90°52.5'E in central Bangladesh. Topographically, the study area lies at an altitude of 3 masl (meter above sea level) with an annual average temperature of 36 °C maximum, 12.7 °C minimum and 2,376 mm of rainfall.

### **3.4. Farm visit and data collection**

A pre-structured questionnaire was employed during fieldwork to collect data. First, the investigator interviewed the owner or responsible person of each affected farm or family. A total of 25 owners and/or attendants who had one or more cattle were interviewed by using structured questionnaire. In the survey, information on health problems as well as management system and particulars related to individual cow such genotype, age, parity, housing system, feed quality, rearing system, breeding systems and professional training of owners were recorded.

The various health problems identified were defined and recorded based on the following descriptions/definitions given for each problem. Extensive survey was conducted in 5 areas of Raipura upazila (Horipur, Mohismara, Nobiad, Chanderkandi & Olipura) and in each area 40 dairy cows were selected randomly. Individual farmers were interviewed to obtain information about diseases of dairy cows. In addition, the farm's demographic data included the total number of cattle, the percentage of disease affected animals, and the number of disease related deaths.

#### **3.4.1. Collected data**

Data contained the following information:

- a) Name of disease of cattle
- b) Breed of cattle



- c) Age of cattle
- e) Date of disease occurrence (Approx.)

### **3.4.2. Case classification**

The identified cases were classified based on age, breed and season

a) Classify of cases according to breed

- i. Cross breed
- ii. Local breed

b) Classify of cases according to age

- i. <1year
- ii. 1-4 years
- iii. >4 years

c) Classify of cases according to season

- i. Summer (March to May)
- ii. Rainy (June to October)
- iii. Winter (November to February)

### **3.4.3. General examination of dairy cattle**

The disease and disorder was diagnosed by general physical examination of animals, clinical signs and gross pathology. Clinical examination of all cattle were conducted on the basis of diseases history and owner's complaint, clinical findings and techniques used by Rosenberger (1979) and Samad (1988) to diagnose the diseases and disorders.

Physical condition, behavior, posture, gait, superficial skin wound, prolapse of the uterus and vagina, salivation, nasal discharge, distension of the abdomen, locomotive disturbance, temperature, pulse, and respiratory rate from each animal were recorded. According to the individual case, disease history, owner's complaints were recorded.. Owner's complaints were taken into account while performing general physical examination of a sick animal. Physical examination of different parts and system of the body of each of the sick animals were examined by using the procedures of palpation, percussion, auscultation, needle exploration, extension and flexion of limbs and walking of animals as per methods described by Kelly (1979) and Samad (1988).

#### **3.4.4. Diagnosis of diseases**

The viral, bacterial, protozoal, fungal and mixed infections were diagnosed by owner's complaint & specific clinical signs of the diseases (Khan, 2000 and Jones *et al.*1996). Parasitic infestation was diagnosed by hair loss, emaciation, weakness, rough coat and pale visible mucus membrane and feces examination under microscope. Digestive disorders were diagnosed on basis of salivation, behavior, posture, gait, distension of the abdomen and owner complain. The respiratory disorder was diagnosed on the basis of owner's complaint and abnormal functions of the respiratory system like polypnea, dyspnea, coughing, thoraco-abdominal breathing and by examining the entire respiratory tract (Radostits *et al.*2000). The metabolic disorder was diagnosed after parturition and on the basis of diseases history. Individual farmers were interviewed to obtain information about diseases of dairy cows.

Mastitis: swollen udder, heat, hardness, redness and pain, watery milk, clots or pus present.

Anthrax: sudden death, bleeding from natural opening, staggering, trembling, convulsion.

HS: swollen throat region, high temperature, difficult breathing, and grunting sound.

Foot rot: bad smell from foot, standing with the foot raised, reluctant to move.

Pneumonia: High fever, difficult breathing, cough, nasal discharge, increased respiratory rate.

LSD: nodules all over the body, fever, ocular and nasal discharge.

FMD: sores and blisters on feet, salivation, ulcer on mucous membrane of mouth, high temperature.

BEF: short fever, shivering, lameness and muscle stiffness.

Endoparasite: Enteritis, fetid diarrhea, anemia, generalized edema.

Blood protozoa: High fever (105-107<sup>0</sup> F), ascites, coffee color urine, anemia.

Bloat: distended left abdomen, discomfort, labored breathing.

Diarrhea: watery profuse diarrhea, anorexia, lethargy.

Acidosis: feeding history, anorexia, depression, breathing problem.

Milk fever: unable to stand after calving, weakness, shuffling of the hind feet.

Uterine prolapse: the coming out of the uterus through the vulva commonly shortly after parturition and hanged out with the inner surface outer most.

Retained placenta: a lack of expulsion of the fetal membranes with in the first 24 hours after calving

Postpartum anestrus: not come into estrus cycle again after calving.

Navel ill: enlarged and wet navel, infection and inflammation of the umbilicus of calves.

Hernia: enlarged of an area, hernia ring and content area palpated

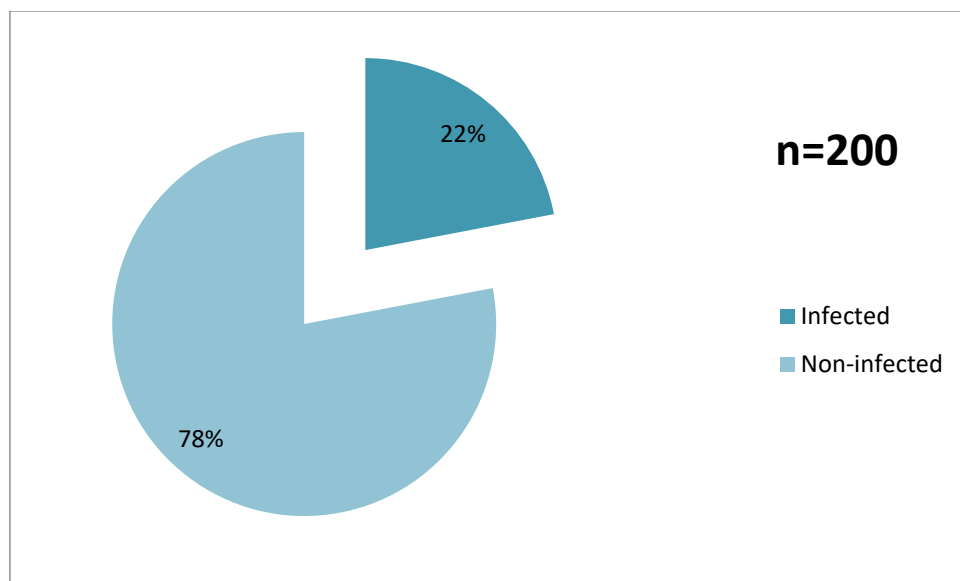
## CHAPTER IV

### RESULTS AND DISCUSSION

During the study period the following diseases were recorded and their prevalence was determined on the basis of breed, age and season.

#### 4.1. Overall prevalence of different diseases in dairy cattle at Raipura upazila

Prevalence studies are of immense importance for disease mapping and investigating the epidemiological triad. In the present study, a total of 200 dairy cattle were examined, out of which 44 cattle were found to be positive for different diseases and disorders. The overall prevalence of different diseases and disorders was 22 %. The findings of this study supported by Munsu *et al.* (2015), who reported 23.22% clinical disease prevalence at cattle farm of Bangladesh Livestock Research Institute, Savar, Dhaka. Sarker *et al.* (2013) reported 73.95% prevalence of clinical diseases and disorders in Sirajganj district in Bangladesh which was higher from the findings of this study. These variations are might be due to different geographical distribution; rearing, housing and feeding system; owner's lack of knowledge about diseases. However, variation in geo-climatic condition, breed, and exposure of vectors, microorganism and age of the animals might contribute to variable prevalence of diseases of dairy cattle in the study areas (Muhanguzi *et al.* 2010).



**Figure 2.** Overall prevalence of different diseases in dairy cattle at Raipura upazila, 2021 (n=200)

## **4.2. Prevalence of different diseases in dairy cattle at Raipura upazila**

### **4.2.1. Mastitis**

During present study a total 19 diseases and disorders were identified from investigated animals. Mastitis, an economically important disease of dairy cattle, was diagnosed on the basis of history and physical abnormalities of udder (Radostitset *al.* 2007). Clinical mastitis was recorded 13.33% in dairy cattle at study area (Table 1) during the period of study which was similar to the findings of Rahman *et al.* (1997) and Sarker *et al.* (2013) who reported 13.3% prevalence of clinical mastitis in cows. Nahian *et al.* (2017) reported 4.44% prevalence of mastitis at Lalmohan upazila, Bhola. The present study also recorded prevalence of mastitis 3.33% in local, 35.71% in cross breed cattle (Table 2), 14.3% in 1-4 years cattle, 21.05% in >4 years cattle (Table 3). Nahian *et al.* (2017) also reported prevalence of mastitis 4.44% in adult, 1.11% in local and 3.33% in cross breed cattle which is higher than the present study. This study also noted highest mastitis prevalence 16.68% during summer season followed by Rainy season (13.34%) and lowest mastitis prevalence 9.1% was recorded during winter season at study area (Table 4). This study reveals that mastitis is the most important infectious disease in dairy cattle in study area. Kabir *et al.*(2010) reported clinical mastitis 1.14%, which is lower than present study. Karim *et al.*(2014) also reported prevalence of mastitis in cows as 1.1%. Lucky *et al.*(2016) recorded that mastitis is the highest among the all metabolic and nutritional diseases. These variations might be due to different geological, feeding, housing condition.

**Table 1.**Prevalence of different diseases of dairy cattle according to disease categories

<b>Disease category</b>	<b>Disease &amp; disorder</b>	<b>No. of case</b>	<b>Prevalence (%)</b>
Bacterial Diseases	Mastitis	6	13.63
	Anthrax	1	2.27
	HS	2	4.54
	Foot Rot	1	2.27
	Pneumonia	3	6.82
Viral Diseases	LSD	5	11.36
	FMD	4	9.1
	Bovine Ephemeral Fever	2	4.54
Parasitic	Endoparasite	2	4.54
	Blood protozoa	2	4.54
Digestive Disorder	Bloat	3	6.82
	Diarrhea	2	4.54
Others	Acidosis	1	2.27
	Milk Fever	2	4.54
	Uterine Prolapse	1	2.27
	Retained Placenta	1	2.27
	Postpartum Anestrus	2	4.54
	Navel ill	3	6.82
	Hernia	1	2.27
<b>Total</b>		<b>44</b>	<b>22</b>

#### 4.2.2. Anthrax

The prevalence of anthrax in the study area was 2.27% (Table 1). Regarding the breeds, the prevalence of anthrax was noticed higher in local breed (3.33%) compared to cross breed (0%) (Table 2). Considering the age, anthrax prevalence (5.26%) was only found in >4 years old dairy cattle (Table 3). It was also recorded 6.67% anthrax prevalence during rainy season in study area (Table 4). Samad (2019) reported 0.21% anthrax prevalence in Bangladesh which was lower than the findings of this present study. Munsi *et al.* (2015) reported no anthrax prevalence in their study. This might be due to routine vaccination and hygienic management of farms.

#### 4.2.3. Hemorrhagic septicemia (HS)

Hemorrhagic septicemia (HS) prevalence was recorded 4.54% in dairy cattle at study area during the period of the study (Table 1), while in case of breed, the prevalence of HS observed in local breed (6.66%) only (Table 2). It was also recorded 7.14 % in 1-4 years cattle, 5.26 % in >4 years cattle (Table 3). On the basis of season, 9.1% and

5.56% HS prevalence recorded during winter and summer season, respectively in study area (Table 4). Almost similar results were reported by Ujjal *et al.* (2018) where they reported 10.78% prevalence of HS in Sylhet region in Bangladesh. Mondal and Yamage (2014) reported 84.9% HS prevalence in dairy cattle. These variations might be due to geological, hygienic sanitation and routine vaccination.

#### **4.2.4. Foot rot**

The prevalence of foot rot of dairy cattle in study area was recorded 2.27% during the study period (Table 1). Regarding the breeds, the prevalence of foot rot 3.33% was noticed in local breed (Table 2). 7.14% prevalence of foot rot was recorded 1-4 years aged dairy cattle in study area (Table 3). It was also recorded 6.67% prevalence of foot rot in dairy cattle during rainy season in study area (Table 4). Sarder *et al.* (2015) and Talukder *et al.* (2018) supported the findings of this experiment. Islam *et al.* (2020) reported 15.22% foot rot prevalence in Sirajganj which was higher than the findings of this experiment.

#### **4.2.5. Pneumonia**

The prevalence of pneumonia in the study area irrespective to breeds, age and seasons was 6.82% (Table 1). Considering the breeds, 6.66% and 7.14% prevalence of pneumonia was recorded in local breed and cross breed, respectively (Table 2). 18.18% prevalence of pneumonia was recorded in <1year aged cattle, 7.14% in 1-4 years aged cattle and 0% in >4 years aged cattle in study area (Table 3). Regarding the season, 0%, 6.67% and 18.2% pneumonia prevalence recorded during summer, rainy and winter season respectively in study area (Table 4). Samad *et al.* (2002) supported the findings of this experiment who reported the highest percentage of pneumonia in cattle during winter (47.06%) in comparison to rainy and summer seasons. Rahman *et al.* (2010) reported respiratory disorders 5.5%, which was slightly lower than performed study. Badruzzaman *et al.* (2015) reported respiratory disorders 3.9% and Karim *et al.* (2014) observed pneumonia 0.7% in cattle. These variations might be due to geological condition and rearing system in study area.

#### **4.2.6. Lumpy skin disease (LSD)**

The prevalence of LSD in the study area irrespective to breeds, age and seasons was 11.36 % (Table 1). Considering the breeds, 10 % and 14.28 % prevalence of LSD was

recorded in local breed and cross breed, respectively (Table 2). 18.18% prevalence of LSD was recorded in <1year aged cattle, 7.14% in 1-4 years aged cattle and 10.53 % in >4 years aged cattle in study area (Table 3). Regarding the season, 11.12%, 6.67% and 18.2 % LSD prevalence recorded during summer, rainy and winter season, respectively in study area (Table 4). Haque *et al.* (2021) reported approximately 64.70% and 83.02% of cattle were affected with LSD in Natore Sadar and Baraigram Upazilas, respectively. Biswas *et al.* (2020) found 63.33% and 52.38% of cattle affected with LSD in Monirampur and Avoy nagor Upazilas, respectively. In Badalgachi, Naogaon, Haque, and Gofur (2020) observed a 49% incidence rate, while in Dinajpur, Bangladesh, Sarkar *et al.* (2020) showed 41.06% prevalence. On the other hand, Hasib *et al.* (2021) showed 10% prevalence in commercial farms; with the most significant farm level outbreak frequency being 63.33% and the lowest was 4.22%. Cattle breed, host vulnerability, herd immunological status, and insects/mechanical vectors involved in virus transmission influence morbidity and mortality (CFSPH, 2011).

#### **4.2.7. Foot and mouth disease (FMD)**

FMD prevalence was recorded 9.10 % in dairy cattle at study area during the period of the study (Table 1), while in case of breed, 10 % prevalence of FMD observed in local breed and 7.14 % in cross breed (Table 2). It was also recorded prevalence of FMD 18.18 % in <1year aged cattle, 7.14 % in 1-4 years cattle, 5.26 % in >4 years cattle (Table 3). On the basis of season, 5.56%, 20% and 0% FMD prevalence recorded during summer, rainy and winter season, respectively in study area (Table 4). Alam *et al.* (2018) reported the prevalence of FMD 14.44% in dairy cattle at Comilla, while Nahian *et al.* (2017) reported 8.89% prevalence at Lalmohan upazila, Bhola. These variations might be due to vaccination may not be so much effective against FMD might be due to widespread FMD, limited vaccination program and mutation of the causative virus of the FMD in cattle (Samad, 2019).

#### **4.2.8. Bovine ephemeral fever**

The prevalence of bovine ephemeral fever of dairy cattle in study area was recorded 4.54% during the study period (Table 1). Regarding the breeds, 3.33% and 7.14% prevalence of bovine ephemeral fever was noticed in local and cross breed, respectively (Table 2). 10.53% prevalence of bovine ephemeral fever was recorded in



>4 years aged dairy cattle in study area (Table 3). It was also recorded prevalence of bovine ephemeral fever of dairy cattle 5.56% during summer, 0% during rainy and 9.1% (Table 4). Badruzzaman *et al.*(2015)reported 0.27% bovine ephemeral fever, which is lower than performed study. It is a vector borne disease specially tick which was prevalent at study area and support the Salkeld *et al.*(2015). Nahian *et al.* (2017) reported 7.78% bovine ephemeral fever, which was higher than the findings of this experiment. These variations might be due to different geological condition, breed, rearing system, feeding system, host resistance.

#### **4.2.9. Endoparasite**

Endoparasite prevalence was recorded 4.54% in dairy cattle at study area during the period of the study what was irrespective to breed, age and season (Table 1). In case of breed, the prevalence of endoparasite observed in local breed (6.66%) only (Table 2). It was also recorded 10.53 % prevalence of endoparsite in >4 years aged dairy cattle (Table 3). On the basis of season, 5.56% and 6.67% endoparasite prevalence was recorded during summer and rainy season, respectively in study area during the study period (Table 4). Badruzzaman *et al.* (2015) and Karim *et al.* (2014)reported Fascioliasis and paramphistomiasis 10.44 %, 6.08% and 12.4%, 8.8%, respectively. Ullah *et al.* (2015) recorded parasitic infestation 26.79%, which is much lower than recorded study.

#### **4.2.10. Blood protozoa**

The prevalence of blood protozoa in the study area was 4.54% (Table 1). Regarding the breeds, the prevalence of blood protozoa was noticed higher in local breed (6.66%) compared to cross breed (0%) (Table 2). Considering the age, 7.14 % and 5.26% blood protozoa prevalence was observed in 1-4 years and >4 years old dairy cattle, respectively (Table 3). Regarding the season, 5.56% and 6.67% blood protozoa prevalence was recorded during summer and rainy season, respectively (Table 4). Alam *et al.* (2018) reported 1.26% prevalence of blood protozoan diseases in dairy cattle which was lower than the findings of this experiment.

#### **4.2.11. Bloat**

Bloat prevalence was recorded 6.82% in dairy cattle at study area during the period of the study (Table 1). The 6.66% prevalence of bloat observed in local breed and 7.14%

in cross breed during study period in study area (Table 2). It was also recorded 14.3 % prevalence in 1-4 years aged cattle, 5.26 % prevalence in >4 years aged cattle (Table 3). Considering the season, 5.56%, 6.67% and 9.1% prevalence of bloat was recorded during summer, rainy and winter season, respectively in study area during the study period (Table 4). Nahian *et al.* (2017) supported the findings of this experiment, who reported 6.67% bloat prevalence in Lalmohan upazila, Bhola. Sarker *et al.* (2013) reported 8.66% bloat prevalence in Sirajganj district which was slightly higher than the findings of the present study. Arju (2013) recorded bloat 1.13% which is lower than performed study. Karim *et al.* (2014) also reported bloat 2.5% in cattle.

#### **4.2.12. Diarrhea**

The prevalence of diarrhea in the study area was 4.54% (Table 1). Regarding the breeds, the prevalence of diarrhea was noticed higher in local breed (6.66%) compared to cross breed (0%) (Table 2). Considering the age, diarrhea prevalence 9.10% was found in <1 year old dairy cattle, when 5.26% was found in >4 years old dairy cattle (Table 3). It was also recorded 5.56% and 9.1% diarrhea prevalence during summer and winter season, respectively in study area (Table 4). 7.78%, 8.99%, 25.97% and 13.4% diarrhea were described in cattle in Bangladesh by Nahian *et al.* (2017), Hoque and Samad (1996), Samad (2001) and Karim *et al.* (2014) respectively which is relatively higher from the performed study.

#### **4.2.13. Acidosis**

Acidosis prevalence was recorded 2.27% in dairy cattle at study area during the period of the study (Table 1), while in case of breed, the prevalence of acidosis observed in local breed (3.33%) only (Table 2). Prevalence of acidosis was recorded 7.14 % in 1-4 years cattle, when others aged cattle recorded no prevalence of acidosis in study area during study period (Table 3). Considering the season, the prevalence of acidosis (6.67%) recorded during rainy season, respectively in study area (Table 4). Badruzzaman *et al.* (2015) and Nahian *et al.* (2017) reported ruminal acidosis 12.24% and 4.44%, respectively which is higher than recorded study.

#### **4.2.14. Milk fever**

The prevalence of milk fever in the study area was 4.54% (Table 1). Regarding the breeds, the prevalence of milk fever was noticed higher in local breed (3.33%)

compared to cross breed (0%) (Table 2). Considering the age, 10.53% prevalence of milk fever was only noted in >4 years old dairy cattle (Table 3). It was also recorded milk fever prevalence 5.56% during summer and 6.67% during rainy season in study area (Table 4). Alam *et al.* (2018) reported 0.94% milk fever prevalence in dairy cattle which was lower than the findings of this experiment. Nahian *et al.* (2017) also reported 1.11% milk fever prevalence in Lalmohan upazila, Bhola.

#### **4.2.15. Uterine prolapse**

Uterine prolapse prevalence was recorded 2.27% in dairy cattle at study area during the period of the study (Table 1). In case of breed, the prevalence of uterine prolapse observed in local breed (3.33%) only (Table 2). Considering the age, the prevalence of uterine prolapse was recorded 0%, 7.14 % and 0 % in <1year, 1-4 years and >4 years aged cattle, respectively (Table 3). On the basis of season, 5.56% uterine prolapse prevalence recorded in dairy cattle during summer season (Table 4). Rahman *et al.* (2017) reported that the prevalence of disease was high in summer (36.26%) than other seasons.

#### **4.2.16. Retained placenta**

The prevalence of retained placenta in the study area was 2.27% (Table 1). Regarding the breeds, the prevalence of retained placenta was noticed higher in local breed (3.33%) compared to cross breed (0%) (Table 2). Regarding the age, 7.14% prevalence of retained placenta was recorded in 1-4 years old dairy cattle in study area (Table 3). It was also recorded 5.56% retained placenta prevalence during summer season in study area (Table 4). Nahian *et al.* (2017) supported the findings of this experiment, who reported 2.22% retained placenta prevalence in dairy cattle. Sarker *et al.* (2013) reported 14.27% retained placenta in cattle which is much higher than the recorded data. Karim *et al.* (2014) also reported 30% retained placenta in all gynaecological cases.

#### **4.2.17. Postpartum anestrus**

Postpartum anestrus prevalence was recorded 4.54% in dairy cattle at study area during the period of the study (Table 1), while in case of breed, the prevalence of postpartum anestrus observed in local breed (3.33%) and cross breed (7.14%) (Table 2). Prevalence of postpartum anestrus also recorded 0% in <1year, 7.14 % in 1-4

years and 5.26 % in >4 years aged cattle (Table 3). On the basis of season, 5.56% and 9.10% postpartum anestrus prevalence recorded during summer and winter season, respectively in study area (Table 4). Nahian *et al.* (2017) supported the findings of this experiment, who reported 4.44% postpartum anestrus prevalence in dairy cattle at Lalmohan upazila, Bhola. Sarker *et al.* (2013) reported postpartum anestrus 11.44% in bovine which is much higher than the recorded data. It might be due to increase parasitic infestation and nutritional deficiency disorders in cattle at study area.

#### **4.2.18. Navel ill**

The prevalence of navel ill in the study area was 6.82% (Table 1). On the basis of breeds, 6.66% and 7.14% prevalence of navel ill was noticed in local and cross breed, respectively (Table 2). Prevalence of navel ill (27.27%) only recorded in <1year old dairy cattle (Table 3). It was also recorded navel ill prevalence 5.56 % during summer, 6.67% during rainy and 9.1% during winter season in study area (Table 4). Islam *et al.* (2015) reported 7.22% navel ill at Muktagacha upazila of Mymensingh district which was slightly higher than the findings of this study. Karim *et al.* (2014) also reported 12.5% prevalence of navel ill at Magura. Islam *et al.* (2015) reported 2.6% prevalence of navel ill at the Adamdighi Veterinary Hospital, Bogra which was lower than the findings of this study. These variations might be due to variation of geo-ecological condition, rearing process, feeding condition, housing condition etc.

#### **4.2.19. Hernia**

Hernia prevalence was recorded 2.27% in dairy cattle at study area during the period of the study which was irrespective to breed, age and season (Table 1). Regarding of cattle breed, the prevalence of hernia 3.33% observed in local breed and no record of hernia in cross breed cattle (Table 2). It was also recorded 9.1% prevalence of hernia in <1year old cattle, while others aged cattle showed no prevalence of hernia (Table 3). On the basis of season, 5.56% hernia prevalence recorded during summer season, in study area (Table 4). Ali *et al.* (2015) reported almost similar findings of this study, who reported that 2.8% hernia prevalence in Savar dairy farm. Rahman *et al.* (2013) reported 10.45% hernia prevalence at Manikgonj which was much higher than the findings of this study. Noman *et al.* (2013) also reported 8.3% hernia prevalence at Sujanagar upazila, Pabna. These variations in disease prevalence might be due to geo-ecological condition, host resistance, sanitation and vaccination condition.

**Table 2.**Prevalence of diseases of dairy cattle according to breed

Disease category	Disease & disorder	Local breed		Cross Breed	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Bacterial Diseases	Mastitis	1	3.33	5	35.71
	Anthrax	1	3.33	0	0
	HS	2	6.66	0	0
	Foot Rot	1	3.33	0	0
Viral Diseases	Pneumonia	2	6.66	1	7.14
	LSD	3	10	2	14.28
	FMD	3	10	1	7.14
	Bovine Ephemeral Fever	1	3.33	1	7.14
Parasitic	Endoparasite	2	6.66	0	0
	Blood protozoa	2	6.66	0	0
Digestive Disorder	Bloat	2	6.66	1	7.14
	Diarrhea	2	6.66	0	0
Others	Acidosis	1	3.33	0	0
	Milk Fever	1	3.33	1	7.14
	Uterine Prolapse	1	3.33	0	0
	Retained Placenta	1	3.33	0	0
	Postpartum Anestrus	1	3.33	1	7.14
	Navel ill	2	6.66	1	7.14
	Hernia	1	3.33	0	0
<b>Total</b>		<b>30</b>	<b>68.18</b>	<b>14</b>	<b>31.82</b>

**Table 3.**Prevalence of different diseases of cattle according to age

Disease category	Disease & disorder	<1year		1-4 years		>4 years	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Bacterial Diseases	Mastitis	0	0	2	14.3	4	21.05
	Anthrax	0	0	0	0	1	5.26
	HS	0	0	1	7.14	1	5.26
	Foot Rot	0	0	1	7.14	0	0
	Pneumonia	2	18.18	1	7.14	0	0
Viral Diseases	LSD	2	18.18	1	7.14	2	10.53
	FMD	2	18.18	1	7.14	1	5.26
	Bovine Ephemeral Fever	0	0	0	0	2	10.53
Parasitic	Endoparasite	0	0	0	0	2	10.53
	Blood protozoa	0	0	1	7.14	1	5.26
Digestive Disorder	Bloat	0	0	2	14.3	1	5.26
	Diarrhea	1	9.1	0	0	1	5.26
Others	Acidosis	0	0	1	7.14	0	0
	Milk Fever	0	0	0	0	2	10.53
	Uterine Prolapse	0	0	1	7.14	0	0
	Retained Placenta	0	0	1	7.14	0	0
	Postpartum Anestrus	0	0	1	7.14	1	5.26
	Navel ill	3	27.27	0	0	0	0
	Hernia	1	9.1	0	0	0	0
<b>Total</b>		<b>11</b>	<b>25</b>	<b>14</b>	<b>31.82</b>	<b>19</b>	<b>43.18</b>

**Table 4.**Prevalence of different diseases of dairy cattle according to season

Disease category	Disease & disorder	Summer		Rainy		Winter	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Bacterial Diseases	Mastitis	3	16.68	2	13.34	1	9.1
	Anthrax	0	0	1	6.67	0	0
	HS	1	5.56	0	0	1	9.1
	Foot Rot	0	0	1	6.67	0	0
	Pneumonia	0	0	1	6.67	2	18.2
Viral Diseases	LSD	2	11.12	1	6.67	2	18.2
	FMD	1	5.56	3	20	0	0
	Bovine Ephemeral Fever	1	5.56	0	0	1	9.1
Parasitic	Endoparasite	1	5.56	1	6.67	0	0
	Blood protozoa	1	5.56	1	6.67	0	0
Digestive Disorder	Bloat	1	5.56	1	6.67	1	9.1
	Diarrhea	1	5.56	0	0	1	9.1
Others	Acidosis	0	0	1	6.67	0	0
	Milk Fever	1	5.56	1	6.67	0	0
	Uterine Prolapse	1	5.56	0	0	0	0
	Retained Placenta	1	5.56	0	0	0	0
	Postpartum Anestrus	1	5.56	0	0	1	9.1
	Navel ill	1	5.56	1	6.67	1	9.1
	Hernia	1	5.56	0	0	0	0
<b>Total</b>		<b>18</b>	<b>40.91</b>	<b>15</b>	<b>34.1</b>	<b>11</b>	<b>25</b>

## CHAPTER V

### SUMMARY AND CONCLUSION

The present study was conducted at Raipura upazila, Narsingdi during January to December, 2021. This study concluded that study area was susceptible to different diseases *viz.* mastitis, hemorrhagic septicemia, pneumonia, lumpy skin disease, foot and mouth disease, bovine ephemeral fever, bloat, diarrhea, navel ill etc. These diseases lead to significant financial losses including meat and milk production in all the year round. Local breeds are more susceptible to diseases compared to cross breed. This study also concluded that adult dairy cattle were infected with more diseases compared to <1year aged cattle. During summer season prevalence of different diseases was higher compared to rainy and winter season due to the presence of high temperature and humidity in study area. In addition, mastitis, FMD, Bovine Ephemeral Fever as well as Diarrhea were very common in that areas. In case of FMD, FMD vaccination, restriction of movement can be effective. In the circumstances of Bovine Ephemeral Fever, live attenuated vaccine can prevent the outbreak and annually boosting maintain immunity. Hygienic management should be initiated to curb the prevalence of common diseases and disorders in dairy cattle. To recapitulate, accurate planning and program should be taken on hand for prevention and control of common diseases of dairy cattle population in study area.



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