

Prevalence of Ruminant Acidosis and other Clinical Diseases at Rangunia Upazilla, Chattogram, Bangladesh



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Session: 2015 – 2016

A clinical report submitted in partial satisfaction of the requirements for the
degree of *Doctor of Veterinary Medicine*

Faculty of Veterinary Medicine

**Chattogram Veterinary and Animal Sciences University
Khulshi, Chattogram- 4225, Bangladesh**

November, 2021

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List of Abbreviations

Abbreviation	Elaboration
DLS	Department of Livestock Services
GDP	Gross Domestic Product
FMD	Food and Mouth Disease
PPR	Peste Des Petits Ruminants
BQ	Black Quater
HF	Holstein Friesian
ml	Mililiter
mOsm	Miliosmole
ND	Non Descriptive
SARA	Subacute Ruminal Acidosis
VFA	Volatile Fatty Acid

Acknowledgements

All praises are due to the immeasurable grace and profound kindness of Almighty “GOD”, the supreme authority and supreme ruler of universe, who has empowered me to complete the work successfully.

I would like to express my gratitude to my supervisor, **Professor Dr. Sharmin Chowdhury**, Dept. of Pathology and Parasitology, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University. My heartfelt thanks to her for valuable guidance, suggestion, supervision and encouragements during the entire period of this study to complete this production report.

I would like to express my deep sense of gratitude and thanks to **Professor Dr. Md Alamgir Hossain**, Dean, Faculty of Veterinary Medicine, and CVASU.

I express my sincere gratitude and thanks to **Professor Dr. A. K. M. Saifuddin**, Director of External Affairs, and for his supervision and kind co-operation during the period of internship.

I am also grateful to **Md. Mustafa Kamal**, Upazilla Livestock Officer (ULO), Rangunia Upazilla, Chattogram and **DR. Harun Ar Rashid**, Veterinary Surgeon (VS), Rangunia Upazilla, Chattogram for his cordial information and guidance at the time of farm visiting.

Thanks to the owner of the farm and other helping hands who helped me in collecting data for this study.

Last but not least, I am profoundly grateful to my family members for their endless sympathies, kind co-operation, sacrifices and prayers.

The Author

November, 2021

Abstract

A comprehensive study on prevalence, risk factors and treatment assessment of ruminal acidosis in cattle & goat along with other clinical diseases registered in Upazilla Veterinary Hospital at Rangunia Upazilla in Chattogram district was conducted on February to April, 2021. A total of 174 cases including 21 acidosis cases were included into this study to observe. Cases were diagnosed according to clinical history, signs and laboratory tests (Coproscopy, rumen pH). 12.5% & 11.9% acidosis cases in cattle & goat was recorded, respectively, in the study area. About 6.25% cattle and 7.7% goats were affected with fever of idiopathic cause. Anorexia was observed in 6.25% cattle and 7.04% goats. Moreover, 2.8% cases of bloat was recorded in goats. Diarrhea was observed in about 9.3% & 6.3% cattle & goat, respectively. Other medicinal cases included dysentery (3.1%), respiratory diseases (6.25%), parasitic infestation (11.26%) in cattle and 4.9%, 5.6% & 12.6%, respectively in goats. This study recorded 6.25% cases of FMD in cattle & 8.45% PPR in goats. Mastitis was found in 6.25% cattle & 7.04% goats. LSD was found in 6.25% cattle and the occurrence of black quarter and tetanus were 2.1% in case of goats. The percentage of retained placenta, abortion, dystocia and repeat breeding were 3.1% in each case in cattle. In case of goats, we recorded case of retained placenta, abortion, uterine & vaginal prolapse and repeat breeding syndrome were 1.4%, 3.5%, 1.4%, 1.4%, respectively. There were abscess & myiasis cases; 3.15% and 6.25%, respectively in cattle and 2.11% & 7.04%, respectively in goats. The percentage of hernia in case of goats was 1.45%. Ruminal disorders were majorly observed in non-pregnant animals (52.3%) than pregnant animals (9.52%) and in household animals (85.7%) than farm animals (14.2%). We observed positive correlation between pH and duration of illness; an increase in the duration of illness also increased the rumen pH up to a certain level. The most effective treatment and quicker improvement of the cases was observed that were treated with ruminal (orally) and systemic alkalizer (I/V) along with fluid therapy in both species. This study recommends the farmer to abstain from feeding of large amount of easily digestible carbohydrates to ruminant at a time.

Key words: Acidosis, Prevalence, Diseases, Rumen fluid pH, Cattle, Goat

Chapter -I

Introduction

Livestock is an imperative element of diverse farming structure practiced in Bangladesh for the centuries. Livestock sub-sector provides 1.47% to agricultural GDP and 3% national economy with 20% employment directly and 50% employment indirectly. Ruminants, particularly cattle and goat constitute the key fundamentals of the livestock industry. There are around 243.91 lakh cattle and 264.35 lakh goats reared in Bangladesh (DLS, 2021).

Livestock suffers from many diseases including both infectious and non-infectious causes. Ruminal acidosis is a non-infectious disease which can cause great economic loss to a farmer. Ruminal acidosis occur when ruminant ingest huge amount of rapidly fermentable carbohydrates mainly starches and sugar or it can happen due to sudden changes to a diet containing high level of finely ground rapidly fermentable feed such as corn or wheat (Beauchemia and Penner ,2009).

This may happen in feedlots where feeder steers are introduced to total concentrate diets rather than being gradually changed from high roughage to high concentrate feeds (Divers *et al.*, 2008). Ruminal acidosis is a fermentation disorder in the rumen characterized by a lower-than-normal ruminal pH reflecting an imbalance between microbial production, microbial utilization and ruminal absorption of volatile fatty acid (VFA). Some 30% to 50% of the acid in the rumen is neutralized by salivary buffers or bound to ammonia generated from urea entering across the ruminal wall. A smaller quantity passes on into the lower gastrointestinal tract. However, even the most conservative estimates leave a significant proportion of about 30-50% of the acid that is ruminally produced and that has to be absorbed by the ruminal wall and one of the most important reasons for the appearance of ruminal acidosis would be a decrease in the absorptive capacity of the rumen which is thus unable to maintain a stable pH (Saleem *et al.*, 2013).

In lactic acidosis blood lactate level is increased greater than 5mmole/L and arterial pH decreased less than 7.25 due to accumulation of H⁺ ions from lactic acid (Robert *et al.*, 1982). It can cause ruminitis, metabolic acidosis, lameness, pneumonia and death (Lean *et al.*, 2000).

Primarily diagnosis can be done based on clinical history and clinical signs; feeding history with anorexia, abdominal pain, distended abdomen, tachycardia, abnormal fast breathing, and diarrhea and ruminal pH (Nordlund, 2004). Acidosis not only hamper the animal health and

economics but also affects the animal welfare since lameness and laminitis impact significantly on animal comfort and general wellbeing (Oetzel,2003).

The line of treatment includes correction of ruminal and systemic acidosis and prevent further production of lactic acid, restoration of fluid and electrolyte losses and facilitate forestomach and intestinal motility to normal (Radostits *et al.*, 2006). Most of the acutely affected animals die due to lack of proper treatment selection which cause a great economic loss in our country.

In Bangladesh, most of the cases of ruminal acidosis resulting from accidental intake of large amount of cooked rice, bread, kitchen wastes, rice gruel, potato, jackfruit residue and other easily digestible carbohydrates. Nowadays it has been seen that farmers tends to fattening cattle without knowing proper feeding practice which causes a considerable number of animals affected with ruminal acidosis

Along with this non-infectious disease, both cattle and goat suffers from a wide range of diseases including different systemic diseases, metabolic disorders and reproductive problems as well. Improper managemental practices in vaccination, deworming, bio-security, poor hygienic condition might be responsible for different diseases and reproductive failure of appropriate veterinary practice and effective disease control in cattle and goat.

Limited/no study have been conducted in the study area- Rangunia Upazilla to explore prevalence, risk factors, and effectiveness of treatment of ruminal acidosis as well as other clinical diseases. Therefore, the present study was designed to achieve the following objectives:

1. To estimate the prevalence and risk factors of ruminal acidosis in Rangunia Upazilla, Chattogram
2. Estimate the prevalence of other clinical diseases in Rangunia Upazilla, Chattogram.

Chapter -II

Materials and method

2.1. Study population and period:

The study was carried out for the period of 3 months from 1st February 2021 to 31st April 2021 at Rangunia Upazilla, Chattogram. The study was undertaken on twenty (N=20) animals for ruminal acidosis and one hundred sixty (N=160) animals for overall disease prevalence which includes both cattle and goats.

2.2: Study area:

The study was performed at Upazilla Livestock Office, Rangunia in Chattogram district, Bangladesh. Rangunia Upazilla is located in between 22°18' and 22°37' north latitudes and in between 91°58' and 92°08' east longitudes. It has 46,176 households and a total area of 347.72 km². It is surrounded by Chandanaish Upazilla on the south; Patiya Upazilla, Boalkhali Upazilla, Raozan Upazilla & Kawkhali Upazilla of Rangamati district on the west; Kawkhali Upazilla of Rangamati district on the north and Kaptai Upazilla & Rajasthali Upazilla of Rangamati district and Bandarban Sadar Upazilla on the east. Rangunia is the headquarter of this Upazilla.

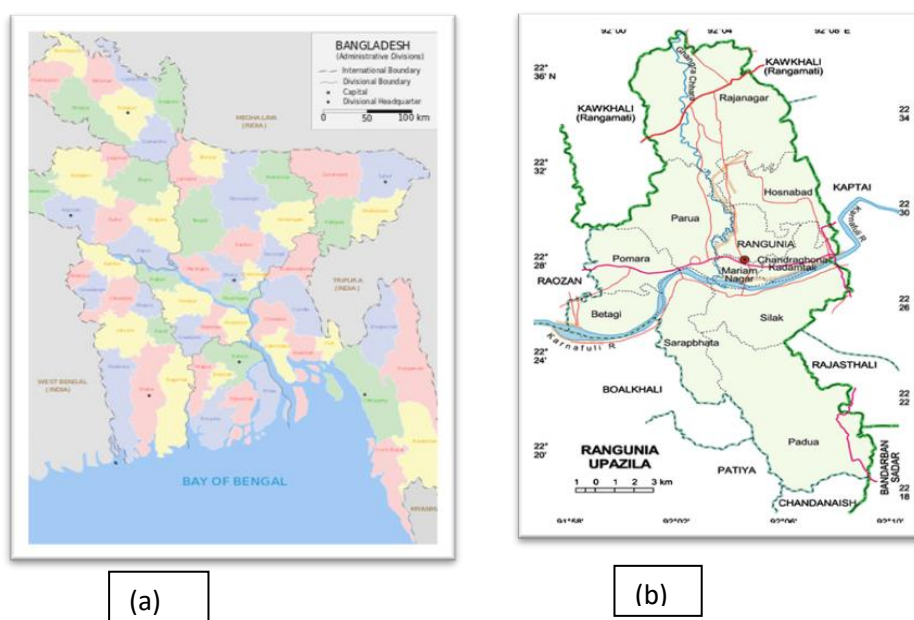


Fig 2.1: Geographical location of data collection site.(a) Map of Bangladesh, (b) Map of Rangunia Upazilla.

2.3: General examination:

Physical condition, behavior, posture, gait, superficial skin wound, prolapse of the uterus and vagina, salivation, nasal discharge, distension of the abdomen, locomotive disturbance etc. were observed by visual examination of the patient.

2.4: Physical examination:

Examination of different parts and system of the body of each of the sick animals were done by using procedure of palpation, percussion, auscultation, needle puncture and by making the animals to walk.

2.5: Clinical examination

The temperature, pulse, and respiratory rate from each of the sick animals were recorded. Clinical examinations of all 174 clinically sick ruminants (cattle = 32, goat = 142) of different ages were conducted on the basis of diseases history, owner complaint, symptoms, to diagnose the following diseases and disorders.

These recorded clinical cases were primarily categorized into three major groups on the basis of treatment required. These groups were: (1) Medicinal cases, (2) Gynaeco-obstetrical cases and (3) Surgical cases.

2.6. Data collection:

For collecting necessary and required information a structured questionnaire was followed during the study period. Data related to animal demography (age, sex, breed), body condition score, physiological status (puberty estrus, lactation status, pregnancy status), parity, housing, feeding, vaccination and deworming status, feces consistency, frequency of diarrhea, ruminal motility, ruminal fluid color and consistency, rectal temperature, duration of illness along with clinical sign and treatment given was collected. Both open and close ended questionnaire was followed for collecting information.

2.7: Sample collection and evaluation:

For determination of ruminal pH, rumen fluid was collected through the process of rumenocentesis. A 14 gauge needle which is about 5 inch long was used for collecting rumen fluid. A 10 ml disposable syringe was attached to the needle. As rumen is located in almost half of the abdominal cavity extends from 7th to 8th intercostal space to pelvic inlet, a 2x2cm area was marked on the left paralumber fossa covering one hand length ventral to the lumber transverse process and one hand width caudal to the last rib in case of cattle. In case of goat as like as in cattle, an area was marked at left paralumber fossa which is 3 inches ventral to the lumber transverse process and 2 inches caudal to the last rib. Before inserting needle, the area was shaved and sterilized. Then inserting needle about 5 ml rumen fluid was collected which was taken to a sample vial. One (1) drop of rumen fluid was taken on a watch glass and piece of pH indicator paper was inserted through the fluid to observe the color change within few seconds. On the basis of color change the pH is determined where...milky gray, blackish green and olive to brownish green indicated acidic, basic or neutral, respectively.

Ruminal motility was observed by both inspection method and by applying microscope. To estimate the status of ruminal microflora a drop of fluid was taken in a slide and observed the motility under microscope by putting a cover slip at 10x.

2.8: Statistical analysis:

All data which were collected on a questionnaire entered into MS excel (Microsoft office excel-2007, USA). Data management and data analysis were done by STATA version-13 (STATA corporation, 4905, Lake way River, College station, Texas 77845, USA).



A



D



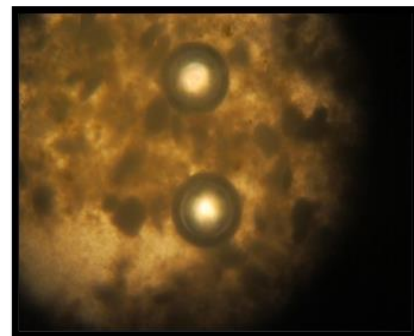
B



E



C



F

Figures1: **A:** Penetrating of stomach tube through mouth cavity. **B:** Paddle pump part of stomach tube. **C:** Rumen fluid in kidney. Tray **D:** Syringe with 14-gauge needle and pH Indicator paper for estimation of ruminal and serum pH **E:** Matching of pH indicator paper with standard **F:** Rumen microflora movement observed under microscope

Chapter-III

Results

3.1: Prevalence of clinical diseases in cattle & goats:

Of the 32 recorded clinical cases of sick cattle, there was 81.25% medicinal case, 9.3% gynaeco-obstetrical and 9.3% surgical cases. Of the 142 clinically sick goats, 80.63% was medicinal, 7.7% was gynaeco-obstetrical and 12.66% was surgical cases (Table 3.1).

Table 3.1: Prevalence of clinical diseases in cattle and goat:

Diseases	Cattle(n=32)		Goat(n=142)	
	No of animal	percentage	No of animal	Percentage (%)
Fever	2	6.25	11	7.7
Anorexia	2	6.25	10	7.04
Bloat	0	0	4	2.8
Diarrhea	3	9.3	9	6.3
Dysentery	1	3.1	7	4.9
Respiratory distress	2	6.25	8	5.6
Corneal opacity	0	0	0	0
Fascioliasis	0	0	2	1.4
Paramhistomoniasis	1	3.1	0	0
Gastrointestinal nematodiasis	3	2.1	16	11.2
Ectoparasite infestation	2	6.25	4	2.8
FMD	2	6.25	0	0
PPR	0	0	12	8.45

Black quarter	0	0	3	2.1
Tetanus	0	0	3	2.1
Mastitis	2	6.25	10	7.04
Hump sore	0	0	0	0
LSD	2	6.25	0	0
Acidosis	4	12.5	16	11.2
Subtotal Medicinal case	26	81.25	115	80.63
Retain Placenta	1	3.1	2	1.4
Abortion & Dystocia	1	3.1	5	3.5
Uterine and vaginal prolapse	0	0	2	1.4
Repeat Breeder	1	3.1	2	1.4
Sub-total(Gynaeco- obstetrical cases)	3	9.3	11	7.7
Abscess	1	3.1	3	2.11
Myiasis	2	6.25	10	7.04
Navel ill	0	0	3	2.11
Hernia	0	0	2	1.4
Sub-total(Surgical cases)	3	9.3	18	12.66

3.2: Prevalence of ruminal acidosis according to different species, sexes, breeds and age groups:

A total of 174 ruminants included both cattle and goats were observed during the study period, among them 21 were identified with ruminal acidosis and overall prevalence was 12.06%.

The occurrence (%) of ruminal acidosis in different species, sexes, breeds and age groups of animals. Occurrence in cattle was recorded 12.5% and in goats 11.9%. Among cattle, occurrence in male and female was recorded 3.2% & 9.3%, respectively and in goats, 6.3% and 8.4%. Occurrence varied according to breeds; cross (6.25%), Holstein Friesian (HF cross) (3.1%) & Red Chittagong Cattle (RCC) 3.1%, and in goats, Jamnapari (2.1%) and Black Bengal (9.8%). Occurrence of acidosis according to different age groups of cattle was 9.3% in <2 years cattle and 3.1% in >2 years, and in goats 4.9% in <1.5 years and 7.04% in >1.5 years. (Table3.2)

Table 3.2: Prevalence of ruminal acidosis according to different species, sexes, breeds and age groups:

Categories	No of animal(n)	variables	Positive cases	Negative cases	Occurrence (%)
Species	Cattle(n=32)	Cattle	4	28	12.5
	Goat(n=142)	Goat	17	125	11.9
sex	Cattle(n=32)	Male	1	13	3.2
		Female	3	15	9.3
	Goat(n=142)	Male	9	36	6.3
		Female	12	85	8.4
Breed	Cattle(n=32)	HF	1	1	3.1
		Cross	2	26	6.25
		RCC	1	1	3.1
	Goat(n=142)	Jamnapari	3	8	2.11
		Black Bengal	14	117	9.8
Age	Cattle(n=32)	<2 years	3	13	9.3
		>2 years	1	15	3.1
	Goat(n=142)	<1.5 years	10	38	7.04
		>1.5 years	7	87	4.9

3.3: Clinical history related to ruminal acidosis:

Table 3.3 showed that ruminal disorder was found mostly in non- pregnant animals (52.3%) than pregnant animals (9.52%) and in household animals (85.7%) than farm animals (14.2%).

Table 3.3: Clinical history related to ruminal acidosis:

Variable	Categories	Frequency	Percentage
Physiological Status	Pregnant	2	9.52
	Non pregnant	11	52.3
	Puberty	5	23.8
	Calf/kid	3	14.2
BCS	5	0	0
	4	7	33.3
	3	12	57.4
	<3	2	9.52
Duration of illness (Days)	1-2	8	38.09
	3-5	9	42.8
	>5	4	19.04
Housing	Semi-intensive	18	85.7
	Intensive	3	14.2
Vaccination	Yes	7	33.3
	No	14	66.67
Time of last feeding(hour)	<12 hour	11	52.6
	>12 hour	12	57.4
Any Drug used or not	Yes	8	38.09
	No	13	61.9

3.4: Analysis of clinical signs involved in ruminal acidosis in cattle and goat:

The most commonly found clinical signs related to acidosis were dehydration, diarrhea, and extraneous materials in feces, abnormality in abdomen size and lameness. There were found moderate dehydration in most of the cases (38.09%) and in few cases there were found mild and severe dehydration. About 57.4% cases, the abdomen size was normal and about 42.8% cases, the abdomen was distended. (Table 3.4)

Table3.4: Clinical signs related to acidosis:

Variables	Categories	Frequency	Percentage
Dehydration	Mild	3	14.2
	Moderate	10	47.6
	Severe	8	38.09
Diarrhoea	Yes	9	42.8
	No	12	57.4
Presence of extraneous material in feces	Undigestable feed	9	42.8
	Parasite	8	38.09
	Mucus	4	19.04
	Blood	0	0
Abdomen	Distended	9	42.8
	Non- distended	12	57.4
Lameness	Present	7	33.3
	Absent	14	66.67

3.5: Factors having potential to occur ruminal acidosis in cattle and goats:

Ruminal acidosis in cattle occurred in 50% cases due to cooked rice followed by 25% due to bread and jackfruit residue. In case goats, 52% of case found due to cooked rice followed by 17.6% and 29.4% cases due to rice gruel and bread. (Table 3.5).

Table3.5: Potential risk factors for the occurrence of ruminal acidosis in cattle and goats:

Species	Feed categories	Cases	Percentage (%)
Cattle	Cooked rice	2	50
	Kitchen waste	0	0
	Bread	1	25
	Jackfruit residue	1	25
Goat	Cooked rice	9	52
	Rice gruel	3	17.6
	Bread	5	29.4

3.6: Clinical parameter in ruminal acidosis in cattle and goats:

The mean temperature, ruminal motility per minute and ruminal pH were 101.9 ± 2.3 , 2.42 ± 0.5 , 4.67 ± 0.70 with a range of 97-105, 2-4, 3-6.9, respectively in cattle. (Table 3.6)

Table 3.6: Descriptive statistics of different clinical parameter in cattle:

Parameter	Mean \pm SD	Range
Temperature	101.9 ± 2.3	97-105
Rumen motility/min	2.42 ± 0.5	2-4
Ruminal fluid pH	4.67 ± 0.70	3-6.9

In case of goat, the mean temperature, ruminal motility per minute and ruminal pH were 102.1 ± 2.32 , 2.4 ± 0.51 , 4.62 ± 0.75 , respectively. (Table 3.7)

Table 3.7: Descriptive statistics of different clinical parameter in goat:

Parameter	Mean \pm SD	Range
Temperature	102.1 ± 2.32	97-105
Rumen motility/min	2.4 ± 0.51	2-4
Ruminal PH	4.62 ± 0.75	3-6.9

3.7: Analysis of factors related to Rumen fluid:

During examination of rumen fluid, presence of rumen flora movement under microscope was observed in 42.8% cases in both cattle and goats. The color of rumen fluid was greenish, greenish brown, milky gray and muddy in 42.8%, 23.8%, 19.04% and 14.2%, respectively in cattle and goats. The consistency of rumen fluid was watery, thick watery and gruel like in 52.3%, 23.8% & 23.8% cases, respectively in cattle and goats. Both sour and pungent odor was found in 61.95% & 38.09% cases, respectively in cattle and goat. (Table 3.8)

Table 3.8: Analysis of factors related to Rumen fluid:

Parameter	category	No of animal	Occurrence (%)
Rumen flora movement	Present	9	42.8
	Absent	12	57.1
Color of rumen fluid	Greenish	9	42.8
	Greenish Brown	5	23.8
	Milky gray	4	19.04
	Muddy	3	14.2
Consistency of rumen fluid	Watery	11	52.3
	Thick watery	5	23.8
	Gruel like	5	23.8
Odor	Sour	13	61.9
	Pungent	8	38.09

3.8: Rumen fluid pH of different cases in relation with duration of illness in cattle and goats:

The rumen fluid pH was 4.3 at 12 hours later of onset of disease in cattle which is the lowest while 24 hours later it was 5.0. The highest pH found at 72 hours later of onset of illness was 5.8 in cattle. Similarly in goats, there found same trend with pH and duration of illness. (Table3.9 & 3.10)

Table 3.9: Rumen fluid pH of different cases in relation with duration of illness in Cattle:

Case no.	Duration of illness (hours)	Rumen pH
1	72	5.8
2	48	5.6
3	36	5.0
4	12	4.3

Table 3.10: Rumen fluid pH of different cases in relation with duration of illness in Goat:

Case no.	Duration of illness (hours)	Rumen pH
1	18	4.2
2	36	4.7
3	24	4.4
4	15	4.1
5	48	5.8
6	72	6.0

3.9: Response to treatment:

Among 4 different types of treatment group the response of 'D' group cases was quicker in comparison to others which was about 75% within 3 days and 100% recovery within 5 days. The recovery period was higher in case of group 'A' which took 7 days for 100% recovery. Other groups took more than 5 days for 100% recovery.

Table no 3.11: Response to treatment of different groups of animal in different treatments:

Groups	Treatment protocol	No. of animal	No. of recovered animal within days						
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
A	Ruminal Alkalizer	2					1 (50%)	1 (50%)	2 (100%)
B	Ruminal Alkalizer+ purgative	2				1 (50%)	1 (50%)	2 (100%)	
C	Fluid therapy+systemic alkalizer	4			1 (25%)	2 (50%)	1 (25%)	4 (100%)	
D	Ruminal & systemic alkalizer +fluid	8			6 (75%)	2 (25%)	8 (100%)		

Chapter-IV

Discussion

Diversified clinical cases in cattle & goat was observed in the present study. Many of the earlier studies found similar pattern of disease diversity in Bangladesh (Rahman *et al.*, 2012).

The proportionate prevalence of ruminal acidosis in cattle was 12.5% in this study which is not concordant with the findings of Bramley (2007) where a herd level prevalence was recorded as 3% in a survey on 100 Australian dairy cows might be due to variation in the study area. In goat the prevalence was 11.9% which is higher than reported by Blom (1993) showed 2.6% prevalence might be due to difference in study settings. There was found no remarkable difference in prevalence of ruminal acidosis in between cattle and goats which is agreed with the findings of Radostits *et al.* (2006) who reported that all types of ruminant are susceptible to ruminal acidosis.

In the present study, household animals were more susceptible to ruminal disorders than farm animals as farm animals are provided feed with formulated ration. The higher occurrence of ruminal disorders in females observed in the present study than male that could be due to the increased appetite of female animals to meet the nutritional demands during pregnancy and lactation (Schipper, 2000; Vanitha *et al.*, 2010). The cross breed animals were more susceptible than local breed and the young animals were more susceptible than adult ones that could be due to lower disease resistance capacity (Garret *et al.*, 1997).

Typical symptoms of ruminal acidosis as anorexia, decreased rumen motility, dehydration, oliguria and diarrhea were observed in the present study and these observations were verified by different studies (Aslan *et al.*, 1995; Owens *et al.*, 1998 and Metkari *et al.*, 2001), where it was stated that the increased concentration of lactic acid and the elevation of ruminal osmolality might lead to such manifestations.

In this study, we found moderate dehydration in most of the cases and some severe dehydration. Dehydration in ruminal acidosis is manifested due to high osmotic pressure of ruminal contents in acidotic condition that pulls up water from systemic circulation (Owens *et al.*, 1998). There were found abdominal distension in few cases as a clinical sign might be due to high osmotic pressure (Above 350 mOsm) inhibit bacterial digestion of fiber and starch causing ruminal

content to become stagnant (Scott, 1975). Lameness was also found in some cases due to laminitis in ruminal acidosis (Shaver, 2005) which mainly occurs due to elevated histamine concentrations and blood vessel damage due to uncontrolled elevations in blood pressure inside the hoof (Vermunt and Greenough, 1994). But Stone (2004) reported that the exact relationship between SARA (Sub-acute ruminal acidosis) and laminitis is not known.

In my study, it was found that sudden ingestion of large amount of easily digestible carbohydrates leads to acidosis and feeding of cooked rice predispose the ruminal acidosis in most of the cases which is supported by previous study (Penner *et al.*, 2007).

In healthy animals the rumen motility is observed three per two minutes as compared to affected goats where the motility was decreased which was supported by other study (Van *et al.*, 2000).

Remarkable changes was found in the physical characteristics of ruminal fluid such as becoming milky color, watery consistency, and souring odor of fluid which was matched with the observations recorded earlier (Jasmin *et al.*, 2011). The odor of ruminal fluid in affected goats was acidic/sour/rancid and fetid might be due to excessive putrefaction or fermentation of carbohydrate rich diet by proliferated gram-positive organisms, which was correlated with the earlier observations recorded (Padmaja and Praveena, 2011; Gupta *et al.*, 2012; Karale, 2012 and Rahima *et al.*, 2012) and in healthy goats the odor was aromatic.

The rumen fluid pH was recorded between minimum value of 4.2 and maximum of 6 in cattle and 4.2 and 5.8 respectively in goat in this study. Several studies (Nocek, 1997 and Owens *et al.*, 1998) showed that the diagnostic ruminal fluid pH for acute acidosis is $< 5 - 5.2$ and for subacute acidosis is between $5 - 5.2$ (Nagaraja and Titgemeyer, 2007). The findings of the present study of positive correlation between the duration of illness of different cases and ruminal fluid pH was similar to other studies (Dunlop, 1972; Nocek, 1997).

The animal treated with ruminal & systemic alkalizer along with fluid responded quickly than other treatment strategy which have similarity with other studies (Khafipour *et al.*, 2009) where they used ruminal alkalizer (Sodium bicarbonate) and intravenous hypertonic sodium bicarbonate (5%) in severe cases in an induced acidosis and observed that all the animals were recovered.

Chapter-V

Conclusion

The present study gives an idea about prevalence of the commonly found clinical diseases in cattle & goat at Rangunia Upazilla in Chittagong city where acidosis was most prevalent. In present study, major predisposing factor for acidosis was recorded as malpractice in feeding. Analysis of the rumen fluid of cattle & goat with different ruminal disorders showed milky grey or brown color, watery consistency, acidic or sour odor and pH ranged from 3.5-6.0. This study showed that the use of ruminal and systemic alkalizer along with fluid in treatment of ruminal acidosis is more effective and has a quicker resolution. This study also showed that to reduce susceptibility of ruminal disorders, balanced nutrition and proper management practices are keys to prevention.

Limitation

Number of limitations was encountered for the current study:

- i) Short study period.
- ii) Small sample size.
- iii) Non-laboratory disease diagnosis.
- iv) Some data collected with indirect way.
- v) Due to pandemic of the COVID-19 outbreak, data collection was not possible directly at the ending of the study.

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Biography

This is Sharmin Akter, daughter of Mr. Monsur Ahmed and Mrs. Shirin Akter. She passed Secondary School Certificate (SSC) examination obtaining GPA 5.00 from Noapara Muslim High School, Chattogram in 2013 and Higher Secondary Certificate (HSC) examination obtaining GPA 5.00 from Chattogram Engineering University School and College, Chattogram in 2015. Then she enrolled for the degree 'Doctor of Veterinary Medicine (DVM)' in Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh. At present, she is dealing as an undergraduate intern veterinarian. She has a high interest in medical research and public health. As a veterinarian, the author wishes to develop her career in the field as a Veterinary Surgeon. Above all, as a human being, she wants to serve the nation through her knowledge, creativity and profession.