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STATUS OF DISEASES AND DISORDERS OF RUMINANTS IN SYLHET, BANGLADESH

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ABSTRACT

A study of ruminant diseases was undertaken 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 old age 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%). This study showed the pattern of diseases that might help to identify the risk factors of these maladies in this area.

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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. 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. Livestock is a vital component of rural economy of Bangladesh where 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. Besides, per capita income of Bangladesh is 750 US dollar and 49% of the total population of Bangladesh is malnourished. Per capita requirement of protein cannot be fulfilled by our protein sources. So, continuous protein deficiency causes various nutritional deficiency diseases followed by infectious diseases and reproductive disturbances. If the livestock sector develops, it will be able to fulfill the existing requirement of protein for the country. Approximately 36% protein requirement is fulfilled by livestock sector. Livestock sub sector contributes 12% to agricultural GDP and 3% to National economy (Mia, 2013).

Livestock subsector provides new raw material for industry, serves a social security for the rural poor, and provides security against crop failure or damage during draught or cyclone. The contribution of livestock to the Gross Domestic Product (GDP) is about 1.7% (BBS, 2015). Livestock sector provides full time employment to approximately 20% and part time employment to approximately 50% of the rural population of Bangladesh. Although Bangladesh has one of the highest cattle densities, 145 large ruminants/ km^2 compared with 90 for India, 30 for Ethiopia and 20 for Brazil. But most of them trace their origin to a poor genetic base. 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. Milk yields are extremely low, 200-250 litters during 10 month lactation period in contrast to 800 litters for Pakistan, 500 litters for India and 700 litters for all Asia. Despite of the highest cattle densities in Bangladesh, the current production of meat and milk are inadequate to meet the current requirement and the deficits are 85.9% and 73.1% respectively (BBS, 2008). According to Bangladesh Economic Review, 2006, the growth rate of GDP in 2004-2005 for livestock was the highest sub sector at 7.23% compared to 0.15% crops and 3.65% for fisheries sub sector. The PRSP stresses the importance of the livestock sub sector in sustaining the acceleration of the poverty reduction in the country. As this is the dynamic potential of this emerging sub sector, it requires policy attention to animal health and production.

The management practices of animals and geo-climatic condition of Bangladesh are favorable for the occurrence of various diseases (Onneshan, 2014). The livestock diseases and disorders of animals are the most important hindrance towards livestock development in our country. There are about 25.7 million cattle, 0.83 million buffaloes, 14.8 million goats and 1.9 million sheep present in Bangladesh (DLS, 2015) but most of the animals are weak, emaciated and with non-satisfactory productive performance due to malnutrition and diseases. Veterinary hospital is an ideal and reliable source of information about animal diseases with their treatment. People from the neighboring areas bring their sick animals to the Veterinary hospital every day. The present study was undertaken and designed with some objectives of identification & analysis of the trend of clinical diseases of ruminant available at Jaintapur Upazila in Sylhet division of Bangladesh to determine clinical prevalence of diseases and disorders in ruminants, to know the comparative prevalence of diseases among different age groups and sex of ruminant and to know the season wise distribution of diseases in ruminant at jaintapur upazila which will help to take different steps as preventive measures to control the incidence of clinical diseases of ruminant.

MATERIALS AND METHODS

Study Area and Time

Sstudy of diseases in ruminants was done using of 1 year data (January, 2016 to December, 2016) in Upazila Veterinary Hospital, Jaintapur, Sylhet.

Sources and Nature of Data

The data of 1 year from January, 2016 to December, 2016 were collected from patient register of Upazila Veterinary Hospital, Jaintapur, Sylhet. The veterinary Hospital is maintained by veterinary surgeon. The data were analyzed retrospectively and interpreted to determine the prevalence of diseases; seasonal pattern and distribution of diseases. The age and sex of the animals were collected from the register. The patient's data were collected from the register book after official permission from the Upazila Livestock Officer of Veterinary Hospital. During the period of study overall 791 diseased animals were recorded from patient register.

Data Processing and Sample Size

The data were checked manually for obvious inconsistencies, recording errors or missing data. The potential errors were evaluated and corrected. Data with suspicious values were excluded. According to age, diseased animals were grouped as 0-2 and 2-6 years. The sample year was divided into three seasons namely summer (July to October), rainy (March to June) and winter (November to February). During the period of study 791 diseased animals were recorded from patient register. Among them number of affected cattle, goat, sheep and buffalo were 538 (male 208, female 330), 182 (male 65, female 117), 17 (male 10, female 7) and 54 (male 23, female 31) respectively. These recorded clinical cases were primarily categorized into eight major groups. These groups were namely: gastrointestinal, infectious, skin, respiratory, reproductive, poisonous, muscular disease and disease of sense organ.

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, temperature, pulse, and respiratory rate from each animal were recorded. According to the individual case, disease history, owner's complaints were recorded. Microscopic examination of feces, blood, urine, skin scraping were carried out if appropriate according to standard methods (Rosenberger, 1979 and Samad *et al.,* 1988). Different parts and systems of the body of each of the sick animals were examined following the procedure of palpation, percussion, auscultation, needle puncture and walking of the animals.

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.

RESULTS

Diseases and Disorders Observed in Different Systems of Ruminants

Data showed that cattle were most susceptible to gastrointestinal diseases (63%) and less susceptible to disease of sense organ (2%) comparable to other systemic diseases

(Fig-1). Goats were most susceptible to gastrointestinal diseases (58.24%) and less susceptible to disease of sense organ (1.65%) comparable to other systemic diseases (Fig-3). Sheep were most susceptible to gastrointestinal diseases (58.82%) and less susceptible to infectious disease 41.18% (Fig-5). Buffaloes were most susceptible to gastrointestinal diseases (68.52%) and less susceptible to disease of sense organ (1.85%) comparable to other systemic diseases (Fig-7).

Sex Wise Distribution

The study revealed that female cattle were significantly affected with diseases and disorder observed in the different systems of cattle whereas male responded as minimum ones (Table 1).

Table 1. Prevalence of disease according to sex (Cattle)

Clinical cases n=538	Total cases	Male		Female	
		Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal diseases	341	127	61.06	214	64.85
Infectious dieases	53	25	12.02	28	8.48
Skin diseases	50	21	10.10	29	8.79
Respiratory diseases	17	8	3.85	9	2.73
Reproductive diseases	20	10	4.81	10	3.03
Muscular diseases	29	8	3.85	21	6.36
Poisonous diseases	20	8	3.85	12	3.64
Diseases of sense organ	8	1	0.48	7	2.12

Table -2: Prevalence of disease according to age (Cattle)

Clinical cases n=538	(0-2) Age		(2-6) Age	
	Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	69	68.32	272	62.24
Infectious disease	10	9.90	43	9.84
Skin disease	7	6.93	43	9.84
Respiratory disease	4	3.96	13	2.97
Reproductive disease	4	3.96	16	3.66
Muscular disease	3	2.97	26	5.95
Poisonous disease	3	2.97	17	3.89
Disease of sense organ	1	0.99	7	1.60

Table 3. Prevalence of diseases according to sex (Goat)

Clinical cases n=182	Total cases	Male		Female	
		Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	106	34	52.31	72	61.54
Infectious disease	26	7	10.77	19	16.24
Skin disease	17	7	10.77	10	8.55
Respiratory disease	18	8	12.31	10	8.55
Reproductive disease	8	8	12.31	0	0.00
Muscular disease	4	0	0.00	4	3.42
Disease of sense organ	3	1	1.54	2	1.71

Table 4. Prevalence of disease according to age (Goat)

Clinical cases n=182	(0-2) Age		(2-6) Age	
	Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	68	53.13	38	70.37
Infectious disease	21	16.41	5	9.26
Skin disease	14	10.94	3	5.56
Respiratory disease	14	10.94	4	7.41
Reproductive disease	8	6.25	0	0.00
Muscular disease	2	1.56	2	3.70
Disease of sense organ	1	0.78	2	3.70

Likely the trend of age based phenomena; worm infestation was also ranked as the most frequent in case of female in the studied areas may be due to less attention against preventing measures of worm. In goat, the diseases of gastrointestinal system were commonly found in female (117) than that of male (65). Based on sex, diseases and disorders in sheep as per systems it can be stated that there were slight differences between male and female as observed in the (Table-5). In buffalo, the diseases of gastrointestinal system were more commonly found in female (29) than that of male (8). Likely the trend of age based phenomena; worm infestation was also ranked as the most frequent in case of female in the studied areas may be due to less attention against preventing measures of worm (data not shown).

Table 5. Prevalence of disease according to sex (Sheep)

Clinical cases n=17	Total cases	Male		Female	
		Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	10	5	50.00	5	71.43
Infectious disease	7	5	50.00	2	28.57

Table 6. Prevalence of disease according to age (Sheep)

Clinical cases n=17	(0-2) Age		(2-6) Age	
	Cases	Prev(%)	Cases	Prev(%)
Gastrointestinal disease	7	63.63	3	50.00
Infectious disease	4	36.36	3	50.00

Table 7. Prevalence of disease according to sex (Buffalo)

Clinical cases n=54	Total cases	Male		Female	
		Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	37	13	56.52	24	77.42
Infectious disease	4	3	13.04	1	3.23
Skin disease	4	1	4.35	3	9.68
Respiratory disease	3	2	8.70	1	3.23
Muscular disease	2	1	4.35	1	3.23
Poisonous disease	3	3	13.04	0	0.00
Disease of sense organ	1	0	0.00	1	3.23

Table 8. Prevalence of disease according to age (Buffalo)

Clinical cases n=54	(0-2) Age		(2-6) Age	
	Cases	Prev (%)	Cases	Prev (%)
Gastrointestinal disease	8	72.73	29	67.44
Infectious disease	0	0.00	4	9.30
Skin disease	0	0.00	4	9.30
Respiratory disease	1	9.09	2	4.65
Muscular disease	0	0.00	2	4.65
Poisonous disease	2	18.18	1	2.33
Disease of sense organ	0	0.00	1	2.33

Season Wise Distribution

Season wise diseases and disorders in cattle were presented in the (Fig-2). The results obtained from the study exerted that diseases and disorders of cattle were more prominent in the summer season than that of rainy and winter ones. It was also observed in the study that all of the diseases were not recorded in all the year round such as 11 no. diseases namely retention of placenta, urinary tract infection, cataract, tetanus, reproductive disease, babesiosis, pneumonia, allergy, malnutrition, jaundice and naval ill were not recorded in summer (data not shown).

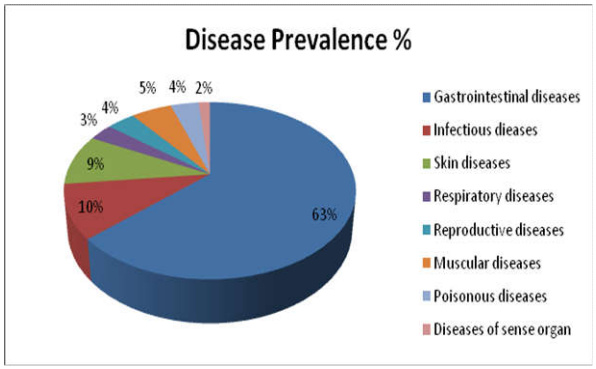
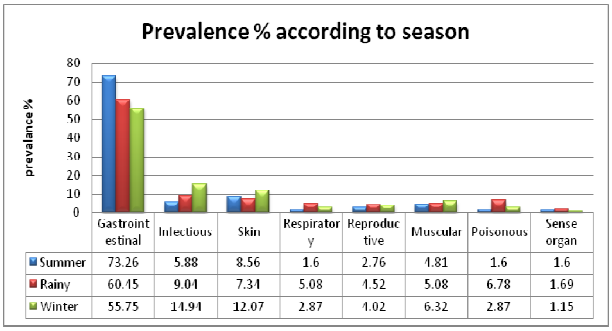


Fig 1. Disease prevalence % of cattle



	Gastrointestinal	Infectious	Skin	Respiratory	Reproductive	Muscular	Poisonous	Sense organ
Summer	73.26	5.88	8.56	1.6	2.76	1.81	1.6	1.6
Rainy	60.15	9.01	7.31	5.08	1.52	5.08	6.78	1.69
Winter	55.75	14.91	12.07	2.87	1.02	6.32	2.87	1.15

Fig. 2. Disease Prevalence % of cattle according to season

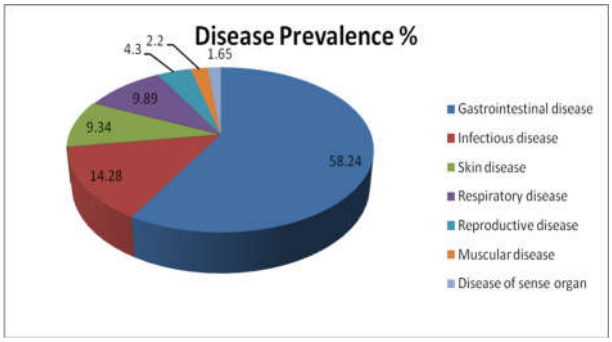
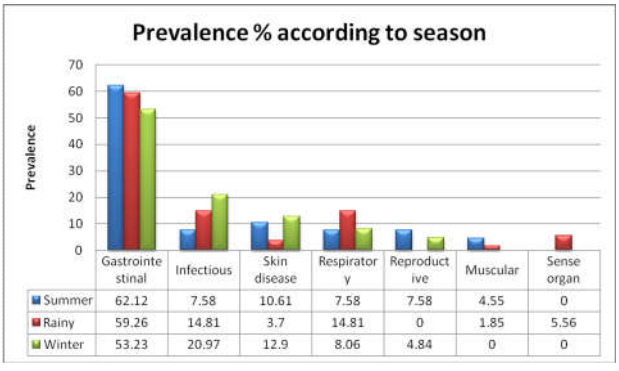


Fig-3: Disease prevalence % of goat



	Gastrointestinal	Infectious	Skin disease	Respiratory	Reproductive	Muscular	Sense organ
Summer	62.12	7.58	10.61	7.58	7.58	4.55	0
Rainy	59.26	14.81	3.7	14.81	0	1.85	5.56
Winter	53.23	20.97	12.9	8.06	4.84	0	0

Fig-4: Disease prevalence % of goat according to season

On the other hand 6 no. of diseases such as cataract, tetanus, tick infestation, HS, liver fluke and Ca deficiency were not affect the cattle during the rainy season in the studied area (data not shown) whereas winter is the more favorable for cattle diseases hence in this time only 11 no. of diseases namely dystocia, retention of placenta, urinary tract infection, colic, rabies, liver fluke, Ca deficiency, lice infestation, keratitis, jaundice and naval ill were not recorded for the period of January, 2016-december, 2016 (data not shown).

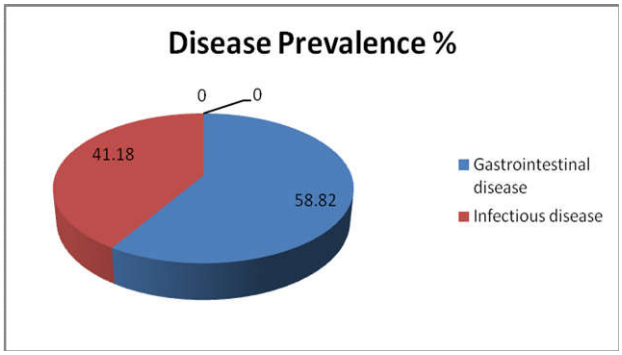
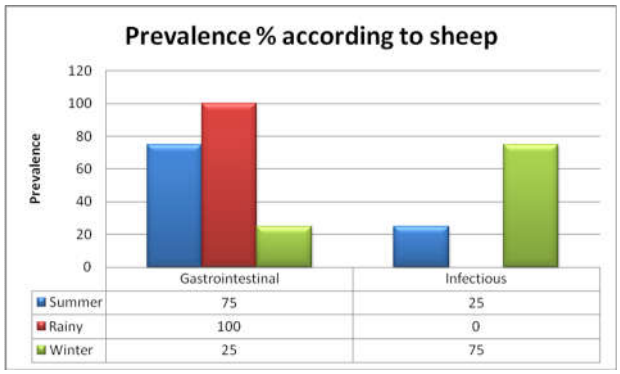


Fig-5: Disease prevalence % of sheep



	Gastrointestinal	Infectious
Summer	75	25
Rainy	100	0
Winter	25	75

Fig-6: Disease prevalence % of sheep according to season

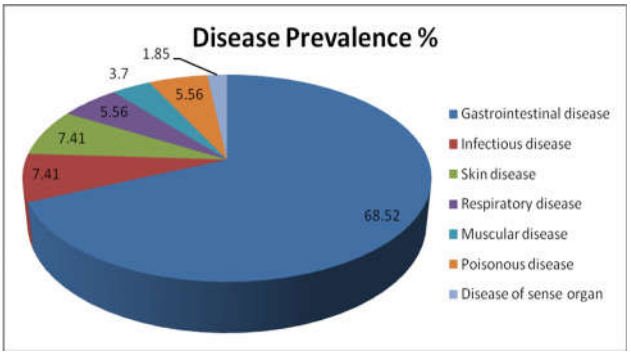
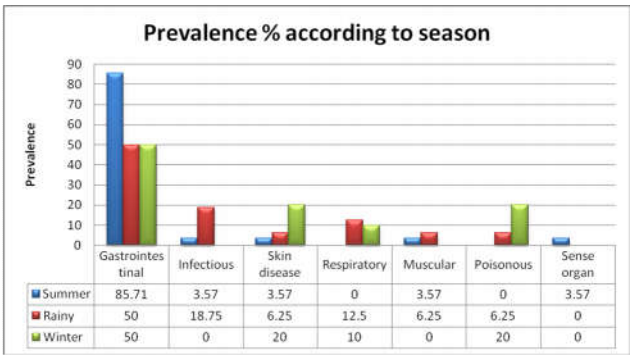


Fig-7: Disease prevalence % of buffalo



	Gastrointestinal	Infectious	Skin disease	Respiratory	Muscular	Poisonous	Sense organ
Summer	85.71	3.57	3.57	0	3.57	0	3.57
Rainy	50	18.75	6.25	12.5	6.25	6.25	0
Winter	50	0	20	10	0	20	0

Fig-8: Disease prevalence % buffalo according to season

In case of goat disease infestation was observed as single ones either the summer or rainy or winter in the studied areas of Sylhet. Data on diseases infestation in goat related with season revealed that most of the diseases occurred during the summer season than that of rainy and winter ones (Fig-4). Accordingly the findings of cattle and goat it was revealed that sheep in the study areas were mostly affected in the winter season than that of other two seasons namely summer and rainy (Fig-6).

In case of winter season the prevalence percentage of gastrointestinal and infectious disease were 25% and 75% respectively. In these cases disease infestation was observed as single ones either the summer or rainy or winter in the studied areas of Sylhet. Data on diseases infestation in buffalo related with season revealed that most of the diseases occurred during the summer season than that of rainy and winter ones (Fig-8). In the study it was found that buffalo of different season were significantly suffering from various diseases and disorders, where maximum no. of buffalo (37) were affected by gastrointestinal diseases (Fig-8).

Age Wise Distribution

In the study (791) ruminants were studied where cattle were (538). According to age, the diseases and disorders observed in the different systems of cattle are shown in the (Table-2). In the study it was found that cattle of different aged were significantly suffering from various diseases and disorders, where maximum no. of cattle (137) were affected by worm infestation. The study also revealed that most of the cattle of all studied aged were affected with gastrointestinal diseases (Table -2). It was exerted from the study that only two numbers of respiratory diseases (cough and pneumonia) as well as three numbers of diseases related to sense organs (corneal opacity, Keratitis and cataract) were found from the studied cattle during the period from January, 2016- December, 2016 in the Janitapur Upazila, Sylhet. Tetanus was recorded as single case (data not shown). Results acquired from the study that worm infestation was more frequent in all the studied aged of cattle as compared with other diseases and disorders. Table-2 also expressed that cattle of 2-6 years old were significantly susceptible to diseases and disorders in contrast of cattle of other studied aged.

Age wise distribution of diseases and disorders in goat as per systems have been summarized and presented in (Table-4). It was observed that, goat of 0-2 years aged were more susceptible than that of older aged. The study also revealed that most of goat of all studied aged were affected with gastrointestinal diseases (diarrhea, worm infestation, anorexia, fever, weakness, avitaminosis, colic, bloat, indigestion and allergy). The prevalence percentage of the gastrointestinal disease is 58.24% (Fig-3). In the study 17 sheep of different aged were recorded for investigating of 7 no. of enlisted diseases related with gastrointestinal system as well as infectious diseases (data not shown).

It was observed that sheep of 0-2 years aged were more susceptible than that of older aged. The study also revealed that sheep of older aged gave fully negative response against the gastrointestinal diseases as well as infectious disease (Table-6). Age wise distribution of diseases and disorders in buffalo as per systems have been summarized and presented in (Table-8). It was observed that buffalo of 2-6 years aged were more susceptible than that of younger aged. The study also revealed that most of buffalo of all studied aged were affected with gastrointestinal diseases (worm infestation, anorexia, fever, weakness, avitaminosis, bloat, indigestion and allergy). It was exerted from the study that only two numbers of respiratory diseases (cough and pneumonia) as well as only one diseases related to sense organs (corneal opacity) were found from the studied buffalo during the period from January, 2016- December, 2016 in the Janitapur Upazila, Sylhet (data not shown).

DISCUSSION

Occurrence of diseases was classified mostly depends on systematic affections. This was done to find which system/s was/were affected and causes health disturbances. Among individual diseases the prevalence of worm infestation was highest followed by 4 diseases were more prevalent viz. diarrhea, fever, FMD and PPR. The prevalence of other diseases was comparatively low. Gastrointestinal system was mostly affected which was similar with Kabir *et al.,* 2010, Ali *et al.,* 2011 and Sarker *et al.,* 2013. Among Gastrointestinal diseases female cattle were mostly affected where poor veterinary health care, particularly strategic parasitic control was lacking (Rahman *et al.,* 2012). In case of cattle the prevalence of gastrointestinal disease in male 61.06% which is higher than the report of Ali et al.,2011,who reported 16.96% prevalence and the prevalence of gastrointestinal disease in female 64.85% which is lower than the report of Ali et al.,2011,who reported 83.03% prevalence. The prevalence of respiratory disease were 3.16 % comparing to all clinical cases which is lower than the report of Pallab *et al.* (2012) who reported 6.20% prevalence. In the current study FMD was found in January, 2016 to December, 2016 were 6.69% in case of cattle (Table-9). Rahman *et al.* (2004) stated 1.7% cases of FMD in cattle that were lower my study. Among viral diseases FMD was found high due to movement of cattle for different purposes. FMD is a transboundary animal disease (Rweyemamu *et al.,* 2008). Even after appropriate vaccination it is very difficult to control unless and until cattle trafficking are stopped and quarantine is followed appropriately during import from international market. Black quarter was recorded in 1.30% of infectious diseases. In cattle the disease is mostly confined to young stock between 6 months to 2 years but occasionally it may occur in younger animals and cattle up to 3 years (Radostits *et al.,* 2007).

Among diseases of different systems those affecting reproductive system constituted highest occurrence is anestrous. This might be due to mainly for nutritional deficiency, infectious diseases, ovarian cyst and failure to heat detection by owners. The prevalence of mastitis was 0.74% in the present study .The higher rates 18.6% had been recorded previously (Prodan *et al.,* 1996 and Rahman *et al.,* 1996). The incidence of mastitis has been reduced significantly world-wide by applying some control measures like treatment of clinical cases, selective dry cow therapy, pre and post milking teat disinfection and improved sanitation of the environment (Tyler *et al.,* 1997, Bradely 2002, Berry and Hillerton 2002). Offering feed to cows after milking to make them in standing condition for some time and administration of vitamin and selenium 5-10 days before calving had also been found to reduce incidence of mastitis in dairy cattle (Smith et al., 1997 and Tyler et al., 1997). Mastitis was also found more in rainy season in the study which was fully supported by Singh *et al.* (1996).

Complete or partial loss of appetite was diagnosed in 5.0% of cases on the basis of history obtained from the owner. Relatively higher occurrences was reported by Samad (2001) who found 33.57% cases of inappetence in cattle brought to Bangladesh Agricultural University Clinic, Mymensingh for the therapeutic purposes. Oral lesion, indigestion, fever, toxemia, stress, poisoning and a lot of others may be responsible for anorexia/inappetance which should be confirmed clinical examination and laboratory aid.

About 1.1% cases were suffering from weakness. Malnutrition, parasitic diseases, debilitating diseases and other factors may be responsible for weakness. Bloat is clinically characterized by marked distension of abdomen with severe distress and dyspnea. About 1.89% cases were suffering from bloat in this study. It is mainly dietary origin and occurs most frequently in ruminants in Bangladesh. Bloat if not treated early it is fatal. If some controllable risk factors of bloat can be identified, it might be possible to reduce the extent of this problem. Diarrhoea is the increased frequency of defecation accompanied by feces containing an increased concentration of water and decreased in dry matter content. In this study 10.59% cattle was suffering from the nonspecific diarrhoea whereas 8.99% and 25.97% diarrhoea were described in cattle in Bangladesh by (Hoque and Samad 1996 and Samad 2001) respectively. During January, 2016 to December, 2016 where highest occurrence of diseases was found in summer (34.76%) followed by rainy (32.90%) and lowest in winter (32.34%). Banu *et al,* (2015) reported the highest occurrence of diseases in cattle in summer (47.9%) followed by rainy (30.1%) and in winter seasons (22.0%), which is different from the present study. Goats were mostly affected with PPR due to its contagious nature and vaccinated goats also affected with it as described by Islam *et al.* (2012). The occurrence of diseases was found to be more in female than male except sheep due to the presence of higher number of female animals in the study area.

Conclusion

The study showed that in Jaintapur Upazila several types of ruminant diseases are found mostly gastrointestinal disease, infectious disease, skin disease, respiratory disease, reproductive disease, muscular disease, poisoning disease and disease of sense organ. . Occurrence of the diseases was higher in female animals than male except sheep where the occurrence of the diseases was higher in male animals than female. Sheep and goat aged between 0-2 years are more likely to be affected by the diseases and disorders. Cattle and buffalo aged between 2-6 years are more likely to be affected by the disease and disorders. More diseases were reported in the summer season except sheep where maximum disease was reported in the winter season. These diseases and disorder of ruminant are predominantly present in this Upazila so it is essential to take proper measurement to ovoid such condition as early as possible.

Proper management, regular anthelmintic therapy and routine Veterinary inspection may help to control this situation very easily. Retrospective epidemiological analysis for a period of 1 year will help to identify risk factors of diseases for developing future control measures. This study may also act as a helpful guideline for veterinary practitioner and further investigation and more study is also needed. Control measure should be initiated to reduce the burden of these diseases/disorders in the study area. This study generated information which is valuable not only for the clinicians, researchers, animal health companies, policy planners, management and control strategy of diseases but also for the academicians to update veterinary curricula.

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