DISEASES AND DISORDERS OF CATTLE AND GOAT AND COMPARATIVE STUDY OF DRUGS IN PPR AFFECTED GOATS

A THESIS

BY

MD. MEZBABUL HOSSAIN

REGISTRATION NO. 1605491

SEMESTER: JANUARY-JUNE, 2018

SESSION: 2016-2017

MASTER OF SCIENCE (MS)

IN

MEDICINE

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[Submitted to the Department of Medicine, Surgery and Obstetrics, Faculty of Veterinary and Animal Science, Hajee Mohammad Danesh Science and Technology University, Dinajpur for partial fulfillment of the requirement of the degree]

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JUNE, 2018

DEDICATED
TO MY
BELOVED PARENTS
AND
HONORABLE TEACHERS

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The Author

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ABSTRACT

The study was conducted to investigate the diseases and disorders of cattle and goat with relation to seasonal variation and sex at Bagherpara upazila in Jessore district of Bangladesh. A total of 2650 (2200 cattle and 450 goat) clinical cases were registered for the clinical diagnosis and therapeutic purposes during the period of January, 2017 to December, 2017. Disease diagnosis was made on the basis of owner's statement, general examination and clinical signs. Diagnosed diseases were categorized as bacterial diseases, viral diseases, parasitic diseases, metabolic and Nutritional diseases, Gyneco-obstetrical cases and Digestive diseases. According to the study the highest (28.64%) prevalence were recorded by parasitic diseases followed by bacterial and viral diseases (27.06%), Digestive disease (19.66%), Gyneco-obstetrical cases (16.27%) and Metabolic and nutritional disease (8.61%) in cattle. Whereas in goat the highest (32.22%) prevalence were recorded by bacterial and viral diseases followed by parasitic diseases (26.67%), Digestive diseases (17.33%), Gyneco-obstetrical cases (12.22%) and Metabolic and Nutritional diseases (11.55%). On the basis of season digestive diseases (26.92%) was significantly ($P<0.01$) higher in summer, parasitic diseases (31.66%) in rainy season and bacterial and viral diseases (34.06%) in winter season. In goat, digestive diseases (23.46%) was significantly ($P<0.01$) higher in summer season but bacterial and viral diseases was higher both in rainy and winter season. Parasitic diseases (36.49%) were highly significant ($P<0.01$) in male than in female cattle and Bacterial and viral diseases were higher (38.30%) in male than in female goat. In treatment trial Gentasone Plus was more effective against PPR due to synergistic reaction of antibiotics that exert more effective action against the secondary bacterial infection.

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LIST OF ABBRIVIATIONS

FVAS	: Faculty of Veterinary and Animal Science
HSTU	: Hajee Mohammad Danesh Science and Technology University
et al.,	: Associate / and others
BCS	: Body Condition Score
BQ	: Black Quarter
EM	: Electron Microscopy
FMD	: Foot and Mouth Disease
FMDV	: Foot and Mouth Disease Virus
FY	: Fiscal Year
GDP	: Gross Domestic Product
HS	: Hemorrhagic Septicemia
MSO	: Medicine, Surgery and Obstetric
PSAC	: Public Services Alliances in Canada
FAOSTAT	: Food and Agricultural Organization Statistics
BBS	: Bangladesh Bureau of Statistics
DLS	: Department of Livestock services
SDG	: Sustainable Development Goals
PPR	: Peste des Petits Ruminants
CE	: Contagious Ecthyma
%	: Percentage
SPSS	: Statistical Package for Social Science

CHAPTER I

INTRODUCTION

Bangladesh is an agro-economy based developing country. About 80% people of Bangladesh live in village and most of them are fully or partially dependent on agriculture and livestock farming (BBS, 2008). In Bangladesh, livestock sector generates employment opportunities for unemployed people 20% of full -time and 50% for part-time population (DLS, 2016). According to 2015-16 annual report, contribution of livestock in Gross Domestic Product (GDP) is 1.66%. GDP growth rate of livestock is 3.21% (DLS 2015-16). Livestock rearing is a vital element in Bangladesh for decades. Among the animals, cattle are the first and goat is the second important livestock population in Bangladesh according to the report of Bangladesh Bureau of Statistics (BBS, 2010). These livestock population plays a significant responsibility in the urban economy (Kamaruddin, 2003). In Bangladesh, the total population of cattle is 237.85 Lakh and of goat is 257.66 Lakh (DLS 2015-16). Bangladesh has high density of cattle population. Among all agricultural activities cattle occupy large area and play a vital role in the national economy and will help to attain Sustainable Development Goals (SDG). It has great importance in economic sector because the Government of Bangladesh has given top priority to livestock development in recent years to meet the growing demand for milk, meat and egg and to create employment and generate income for the rural poor. About 40 percent of the total population in Bangladesh is living below the poverty line in severe hardship. Both growth oriented and target oriented programmes are required to be simultaneously promoted for eradication of their poverty. This task can be successfully accomplished through the development of livestock sub-sector in the country. It produces about 72.75 lakh tones of milk and 61.52 tones of meat in FY 2015-16 and contributes to meet the protein demand of the nation (Economic Review of Bangladesh 2017). Goat is of great economic importance as a major source of income for small and the landless farmers in rural areas. It is the natural resource of Bangladesh. Its keeping is related to the rural poor and landless specially women (Chowdhury, 2002). Several authors (Kamaruddin, 2002; Rana, 2015) also emphasize the importance of goat rearing by landless and marginal farmers for poverty alleviation, women empowerment, youth employment and foreign exchange earnings. For thousands of years they have been used for their milk, meat, hair and skin over much of the world. It is generally reared to procure meat, milk and skin. It is often regarded as poor man's cow. Rearing of goat

plays an important role in the economy of Bangladesh for sustainable livelihood of poor people, because of inherent risk involved in the crop farming due to uncertainty of rainfall and occurrence of recurrent droughts .But the diseases like PPR, Foot rot, FMD, Rabies, HS and other metabolic and nutritional diseases affect the health of animals.

The Veterinary hospitals are the idyllic and consistent resource of information about animal diseases and their elucidation. Veterinary clinics and hospitals become an authentic source of the information about animal diseases and their management. The animals that are affected with various diseases and disorders are always bringing to Veterinary Clinics and Hospital. The owners of the animals from the adjoining areas to the Veterinary hospital or clinic bring their sick animals daily. Cautiously record and analysis of these disease problems at different Upazilla Veterinary Hospital gives an appropriate idea about the cases in local areas for cattle and goats.

Animal diseases like (Bacterial and viral, parasitic, reproductive, metabolic and nutritional, systemic states) are perhaps the most important limitation to animal production in developing countries. Bovine diseases affect production, cattle health, impacts negatively on profitability and trade, and can decimate years of genetic improvement towards desirable production traits (Boland *et al.,* 2010). The incidence of disease is 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 (Bakshi *et al.*, 2001). According to FAO estimate, there are 50 percent production losses due to diseases (PSAC, 1967). Now, it is the time to consider and pay attention to the value and capacity of cattle and goats for producing food. This article discusses and reviews the present status of cattle and goat populations with their improvement of quality. Therefore, the proposed study was carried out with a view to fulfill the following objectives:

1. To study the overall prevalence of diseases and disorders in cattle and goats in Jessore District of Bangladesh.
2. To observe season and sex-wise prevalence of diseases and disorders in cattle and goats in Jessore District.
3. To evaluate the comparative study of drugs in PPR affected goats.

CHAPTER II

REVIEW OF LITERATURE

2.1 Prevalence of diseases in cattle

Kumar *et al.*, (2018) studied was undertaken to know the status of Babesiosis in cattle in the study region. The retrospective study on the basis of past clinical data and incidence pattern of Babesia infections in cattle through microscopic examination (MO) and PCR were done from the Patna region, India. The comparative sensitivity of the MO and PCR were also done. Since the research was based on clinical cases and retrospective data, thus there was no need of taking ethical approval from the committee. The PCR assays based on the *Babesia bigemina* associated protein gene (RAP) was done which revealed the overall percentage of *B. bigemina* were 36% (180/500) and by microscopic observation 3% (22/500). Age wise results revealed that animals of >3yrs are most susceptible (45.42%) followed by 1-3yrs (32.37%) and least<1yr (16.88%). The season wise prevalence was highest in rainy (58.55%), then summer (34.73%) and lowest in winter (6.71%).

Azam *et al.*, (2018) studied was undertaken to determine the clinical prevalence of parasitic diseases in cattle at the Upazilla Veterinary Hospital (UVH), Sadar, Joypurhat district of Bangladesh during June, 2016 to July, 2017. According to the case record, a total of 3560 sick cattle were examined during this period. Disease diagnosis was made on the basis of owner's statement, general examination, physical examination and clinical examination. Out of 3560 clinical case of cattle, 681 (19.13%) cattle were infested with different ecto and endoparasites. According to the study the prevalence of tick infestation (5.48%) was highest followed by fascioliasis (2.98%), ascariasis (2.44%), paramphistomiasis (2.13%), maggot (1.71%), mite infestation (1.32%), schistosomiasis (1.24%), hump sore (1.18%) and haemonchiasis (0.65%) respectively. The sexwise prevalence of parasitic diseases in cattle was found more or less similar in male (19.0%) and female animals (19.26%). It was observed that there was no significant (P>0.05) variation in the prevalence of parasitic diseases in cattle in relation to age of the cattle and season of the year. The overall prevalence of parasitic diseases was found more in young (19.76%) than adult (18.59%) cattle. The overall prevalence of parasitic diseases was higher in winter season (20.10%) followed by rainy season (19.7%) and summer season (17.85%) respectively. This study will provide necessary information regarding

parasitic diseases in cattle of Joypurhat Sadar for their effective control and better production of cattle which will be beneficial for poor farmer.

Moktar *et al.*, (2017) the study was investigate the status of cattle diseases with relation to seasonal variation in Dinajpur district of Bangladesh. A total of 11402 clinical cases were registered for the clinical diagnosis and therapeutic purposes at sadar upazila veterinary hospital in Dinajpur district of Bangladesh during the period of March, 2016 to February, 2017. Disease diagnosis was made on the basis of owner's statement, general examination and clinical signs. Diagnosed diseases were categorized as general clinical disorders, parasitic diseases, viral diseases, bacterial diseases, venereal disease, and metabolic disorders. According to study the highest (64.15%) prevalence was by parasitic disease followed by bacterial diseases (10.67%), viral diseases (8.97%), metabolic disease (7.61%), and venereal disease (6.60%). In respect of seasons, the prevalence of both bacterial diseases and viral diseases were significantly ($p<0.01$) higher (13.88%) and (12.10%) in summer season respectively. Whereas the parasitic diseases were significantly ($p<0.01$) higher (68.65%) in winter season. On the basis of season, it was found that the overall prevalence of diseases was highest in summer season (47.87%) followed by rainy season (30.10%) and comparatively lower in winter season (22.03%).

Dharanesha *et al.*, (2017) studied the present report the seasonal prevalence of blood parasitic diseases in cross bred cattle in Mysore and its surrounding districts of Karnataka such as Mandya, Chamaraj Nagar and Kodagu. The study was undertaken for a period of 2 years from August 2013 to July 2015. A total of 1655 blood samples were collected from clinically suspected cattle for blood parasitic diseases with clinical symptoms of anorexia, high fever, anaemia, and salivation, enlargement of superficial lymphnodes, haemoglobinuria and sudden drop in milk yield. The blood samples were examined by giemsa's staining technique. Of the 1655 blood samples screened, 673 (40.22%) blood samples were found positive for blood parasites. Amid 673 positive samples, 609 (90.49%), 19 (2.82%) and 45 (6.68%) were found positive for *Theileria annulata, Babesia bigemina* and *Anaplasma marginale* respectively. The season wise prevalence revealed that, the highest prevalence was observed in summer months (March-June) (43.17%) followed by rainy (July-October) (39.53%) and winter season (November-February) (39.35%). Further, the month wise prevalence showed highest in August (77.64%) (Rainy month) followed by November (38.23%) and January

(35.93%). During August-2013 to July 2014 and between August-2014 and July 2015, the highest was found in the month of May (85%) followed by July (70%) and April (69.81%). Theileriosis was most prevalent in summer (92.73%) followed by rainy (90.95%) and winter season (87.61%). Babesiosis was most prevalent in winter season (5.04%) followed by rainy (1.8%) and summer season (1.7%) whereas, Anaplasmosis was most prevalent in rainy season (7.23%) followed by winter (6.88%) and summer season (5.55%) during two years of study period.

Sultana *et al.*, (2017) studied the research article describes a cross-sectional study in cattle of District Lahore which aimed to identify prevalence of Eimeria species and risk factors associated with subclinical coccidiosis. A total of 2700 rectal faecal samples were collected from Govt. Dairy Farm, Lahore, Military Dairy Farm, Lahore and peri-urban farm (Gawala Colonies), Lahore under different managemental practices and were screened for different Eimerian oocysts. 1473 faecal sample were found positive for Eimeria species Oocysts Viz *E. bovis* (27.05%), *E. zuernii* (20.14%), *E. subspherica* (11.72%), *E. cylinderica* (23.97%), *E. ellipsoidalis* (19.54%) and the highest (78.66%) month wise prevalence was noted during August whereas the lowest (35.44%) was during April. The results of the study showed that overall the highest (66.22%) prevalence of coccidiosis was noted during autumn followed by summer (59.66%), winter (51.77%) and lowest during spring (38.2%). The highest (45.33%) prevalence of coccidiosis was observed in animals aged between 6 to 12 months, followed by 41.35% in animals under 6 months of age whereas the lowest (36.00%) above I year. Female animals were more frequently affected (41.25%) than males (39.50%). In the present study, the maximum OPG count observed was 55, 000 and the minimum count as 2000.

Mochankana and Ian (2016) studied a period of ten years (2001-2010) was conducted using postmortem meat inspection records of the Department of Veterinary Services in Gaborone to determine the prevalence of bovine fasciolosis in Botswana. Meat inspection records of monthly and annual returns from the two main export abattoirs in the country were examined, as well as the data collected on the total number of cattle slaughtered and the number of livers condemned due to *Fasciola gigantica* infection. Only 1250 of the approximately 1.4 million cattle slaughtered were infected with *F. gigantica* (0.09%, 95% confidence intervals [CI] 0.0% - 0.3%). No distinct seasonal pattern was observed in condemnation rates of livers. However, the pattern of distribution of fasciolosis was higher (but not significant) in cattle that originated from

areas with high rainfall and more permanent water bodies than those from relatively low rainfall areas with a transitory water system. It is recommended that a longitudinal survey should be carried out at the abattoirs and farms to determine the prevalence of the disease in cattle of different ages, sex and breed as well as the place of origin in the country. The present study indicated that the prevalence of fasciolosis in cattle is low and the disease is therefore of less significance in Botswana than other African countries for which information is available.

Miranda (2014) carried out a cross-sectional survey was on 350 farms in the north east of La Pampa Province, Argentina. The goal was to record the prevalence of cattle diseases reported by farmers. Farms were stratified into three categories on the basis of adult herd size (300 to 500 cattle, 500 to 900 cattle and greater than 900 cattle) and a random sample selected from each strata. According to the productive system, farms were classified as fattening (F), cow-calf (C) and cow-calf-fattening (CF). Presented data are part of a comprehensive survey on cattle farms performed by INTA and Ministry of production staff. The information described on this assay corresponds to principal signs and health problems recorded in different farms. Actinosis (n = 115 farms), bovine respiratory diseases (BRD) (n = 77), neonatal calf diarrhea (NCD) (n = 60), copper deficiency (n = 54), and blackleg, gas gangrene and enterotoxaemia (BGE) (n = 39) were the main diseases. NCD and BGE were geographically distributed on the southern half area, while actinosis, copper deficiency and pneumonia were distributed on the central-west area. BRD also showed a second risk area on the northwest. According to production system, BRD was found to be associated to F, while NCD, copper deficiency and BGE were associated to CF. According to strata level, no differences were found for any diseases considered for the present essay.

Teshager *et al.*, (2013) conducted a cross-sectional survey in three districts of Ilu Aba Bora zone of Oromia Regional State to assess prevalent diseases and productive and reproductive performance of cattle. A pre-tested, structured questionnaire was used to collect data. Using a stratified sampling technique, a total of 180 households from three districts were included in the survey. Collected data were analysed using descriptive statistics. Results indicated that the major diseases of cattle reported by respondents included Trypanosomiasis, Black leg, Pasteurollosis and mastitis with indices of 0.295, 0.212, 0.19 and 0.114, respectively. Majority (83.3%) of the respondents used traditional medicine to treat their sick animals. The overall mortality of cattle in the study area was

found to be 19.2%, with 15.7 and 11.2% mortality of heifers and oxen, respectively. The overall average milk production per cow per day, lactation length, age at first calving and calving interval was 1.31±0.03 liter, 8.87±0.12 months, 49.37±0.25 months, 18.76±0.23 months, respectively and there was a significant ($P<0.05$) difference in all reproductive traits of cows among the different study districts.

Naqvi and Fatima (2012) studied the incidence of livestock diseases in Nomal and Naltar valleys, Gilgit. The data on cattle, goat, sheep and donkey were collected from the Animal Husbandry Department from 2003 to 2007. In total 19259 animals were found affected with various diseases. The disorders reported in the area were digestive diseases, infections, mastitis, reproductive diseases, endoparasites, ectoparasites, wounds, hematuria, respiratory diseases, emaciation, hemorrhagic septicemia, tumour, blue tongue, cow pox, enterotoxaemia, tetanus, paralysis and arthritis. In precise, endoparasites were found in 25.3% animals followed by respiratory diseases (24.74%). Most of the cattle (2053) and sheep (926) were found affected with endoparasites, whereas most of the goats (3960) were suffering from respiratory disorders. The seasonal data indicated that the incidence of diseases prevailed was high (33.94%) in winter while it was as low as 14.18% in summer.

Bhattacharyya (2012) investigated a total of 53, 354 numbers of cattle were treated for last 5 years from 1st April, 2003 to 31st March, 2008. They were used to study the prevalence of various gynaecological disorders. The data revealed that the highest prevalence was observed for anoestrus (31.64%) followed by repeat breeding (21.48%), metritis (12.45%), pyometra (10.38%) and retention of placenta (9.31 %). The disorders like ovarian cyst, dystocia, abortion, vulvitis, vaginitis, cervicitis, mummification, maceration etc. were recorded, yet the rate was within clinically acceptable limits.

Cenci-Goga *et al.*, (2008) determined a total of 788 serum samples from dairy cattle in Umbria, Italy, were tested for the presence of antibodies to Mycobacterium avium subspecies paratuberculosis (MAP) using a commercial enzyme-linked immunosorbent assay (ELISA) kit. The sampled animals came from 19 herds representative of the central area of the Umbria County (Perugia and Assisi districts). Using the manufacturers suggested cut-off for a positive test, 44 animals (5.6%) were positive. Using the sensitivity and specificity claimed by the manufacturer of the ELISA kit, the true

prevalence in Umbria dairy cattle overall was calculated as 9.7% (99% CI, 7.0%, 12.4%).

Umbreen *et al.*, (2008) studied were undertaken at slaughter houses, live stock farms, veterinary hospitals and on household buffaloes under different management and climatic conditions in fmy different districts of the Punjab province. Infection rate was 7.83%, 12.33%, 7.17% and 4.25% respectively in the cattle at the slaughter house, live stock farm, and veterinary hospital and at household cattle. Overall the highest prevalence in terms of season, 26% and 14.50%, was recorded during autumn at live stock farms and slaughtered cattle followed by 9.75% veterinary hospitals during summer and the lowest (2.5%) in household cattle was recorded during winter. It was observed that a higher infection rate was recorded in younger cattle (below two years of age) than older (above two years of age). Male cattle were more commonly affected than females. Snails belonging to genera Bulinus, Lymnaea and Planorbis were observed which are responsible for the transmission of paramphistomosis.

Sardar *et al.*, (2006) investigated the prevalence and seasonal variation in liver fluke and gastro-intestinal parasites were studied in native (n = 360) and crossbred (n = 360) cattle with fmy age groups (12-24 months, >24-36 months and >36 months) and three seasons (summer, rainy and winter) in Trishal Upazilla, Mymensingh district for a period of November 2002 to October 2003. Feces were collected to examine the worm load in each of the animal. The maximum rate of infection of gastrointestinal parasite was recorded in crossbred cattle with the exception of Strongylid. In the rainy season highest gastrointestinal parasitic infestation was observed. The infection rates of Fasciola, Paramphistomum, Trichuris and Schistosoma were highest in the age group >36 months and lowest in the age group < 12 months. The infection rates of Ascaris, Strongylid, Strongyloids and Moniezia were very high in the age group < 12 months and low in the age group >36 months.

2.2 Prevalence of diseases in Goats

Ullah *et al.*, (2018) caprine theileriosis is most prevalent and drastic hemoprotozoan disease of goats. The current study was conducted to inspect the prevalence, risk factors and association with host biomarkers of caprine theileriosis. For this purpose, total 600 blood samples were taken, 200 each from goats of three districts distinctive geologically namely Bannu, Tank and Dera Ismail Khan of southern Khyber Pakhtunkhwa, Pakistan.

In districts Bannu, Tank and Dera Ismail Khan, 15.5%, 9% and 18.5% prevalence of caprine theileriosis was recorded respectively. Season, location, feeding pattern, tick infestation, sex, animal keeping, colostrum served amount and housing system were observed as significant factors associated with the occurrence of the disease. Age, breed and herd sizes were observed non-significant ($P > 0.05$) factors associated with the prevalence of disease. Significant maximum cases of caprine theileriosis were due to Theileria ovis as compared to Theileria lestoquardi. Hemato-biochemical examination revealed significant ($P < 0.05$) decrease in erythrocyte, hemoglobin, packed cell volume, lymphocytes level and glucose whereas an increase in Alanine aminotransferase, Aspartate aminotransferase, serum creatinine and urea in the diseased goats. The drastic effects imposed by Theileria lestoquardi on the profile of the affected animals were highly severe as compared to Theileria ovis demonstrating serious damage to liver and kidney.

Baruti *et al.*, (2018) observed an outbreak of peste des petits ruminants (PPR) had occurred in Khanapara area of Guwahati district, Assam. A total of 25 numbers of goats were found to be affected with PPR revealing characteristic signs of respiratory distress, high fever, anorexia, diarrhoea, abdominal cramps, and reluctance to move and so forth. Extremely high rate of morbidity (100%) was recorded in the affected animals. Following prompt treatment, the mortality rate was reduced to 12.5% with complete recovery being observed in 7 days time. The present study attempts to provide fresh insights into the various effective treatment protocols that are available and also the preventive measures that must be put in place to curb PPR outbreak.

Neelam *et al.*, (2017) found goat farming was the great economic importance as a major source of income for small and the landless farmers in rural areas. A study on prevalence of helminths of goat in relation to age, sex, seasonal, tehsil and month-wise was studied at Udaipur district, Rajasthan from May 2016 to January 2017 by faecal examination. Out of a 390 faecal samples examined in which 296 (75.89%) in goat were positive for one or more species of helminth parasites. In goat *Strongyles sp.* were most prevalent (31.08%), followed by *Amphistome sp.* (23.31%), *Trichuris sp.* (15.20%), *Fasciola sp.* (7.77%), *Moniezia sp.* (2.70%) and *Strongyloides sp.* (0.67%). Mixed infection was (19.25%) in goat. In goat, seasonal analysis revealed highest prevalence in rainy season followed by winter and lowest in summer. Tehsil-wise prevalence showed highest prevalence in Mavli tehsil in goat. Sex-wise observations showed females were more

infected with helminth infection than the males in goat respectively. The age-wise prevalence of helminths infection reported highest prevalence in age group more than 2 years followed by 1-2 year group and group 6 month to 1 year in goat. Month wise helminth infection showed higher prevalence in October Month in sheep.

Rahman *et al.*, (2017) studied 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 of182 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.

Bhanot and Mehla (2017) mastitis is an inflammation in the udder and can occur in any lactating animal. Even non lactating animals can harbmy this infection. Goats can have variety of symptoms or none at all. Any abnormality in milk may signal mastitis: clotted, stringy, bloody, off colour, off lavour, and reduced production. Mastitis in goats occurs throughout the year both in clinical and subclinical forms in sporadic outbreaks in livestock farms (Ameh *et al.*, 1993). In clinical mastitis, there are changes in milk colour, clots are present in the milk, and there are large numbers of leukocytes in the milk. Swelling, heat, pain, and indurations may be observed in the mammary gland in clinical cases; these symptoms can be detected by visual observation of the udder. In subclinical

mastitis, there are no clinical signs of disease other than an increased somatic cell count in the milk, the presence of pathogenic organisms in the milk, and an inflammatory response that can only be detected by screening or laboratory tests. Obviously subclinical mastitis is one of the most important infectious diseases in small ruminants. Furthermore, subclinical mastitis represents a constant risk of infection for the whole stock. As there is a need for higher milk yields and more stringent requirements on milk quality in dairy goat herds, udder infections must be prevented or detected at an early stage not only to protect the farmer but rather the consumer. Moreover, the greatest problem in the treatment and control of mastitis is the emergence of drug resistance due to indiscriminate use of antibacterial drugs. This paper describes prevalence of clinical and sub-clinical mastitis in goats in Ambala district of Haryana.

Fentie *et al.*, (2017) sheep pox and goat pox are contagious viral diseases of sheep and goats, respectively. The diseases result in substantial economic losses due to decreased milk and meat production, damage to hides and wool, and possible trade restriction. A study was undertaken in Amhara region of Ethiopia. A cross-sectional study design was used to estimate the sero-prevalence and identify associated risk factors, while retrospective study design was used to assess the temporal and spatial distribution of the disease. A total of 672 serum samples were collected from 30 Kebeles and tested using virus neutralization test. From a total of 672 sera tested, 104 (15.5%) were positive for sheep and goat pox virus antibody; from which 56 (17%) were sheep and 48 (14%) were goats. The diseases were prevalent in all study zones, the highest sero-prevalence was observed in South Gondar (20.9%) and the lowest in North Gondar and West Gojjam zones (11.9% each). From the potential risk factors considered (species, sex, age, agro-ecology and location); only sex and age were significantly associated ($p < 0.05$) with the diseases in multivariable logistic regression. Female and young animals were at higher risk than their counterparts. From January 2010 to December 2014, a total of 366 outbreaks, 12, 822 cases and 1480 deaths due to SP and 182 outbreaks, 10, 066 cases and 997 deaths due to GP were recorded in Amhara National Regional State. Both the serological and the outbreak data revealed that sheep and goat pox is one of the most prevalent and widespread diseases of sheep and goats in the study area. Hence, annual mass vaccination program must be implemented for economic and viable control of sheep and goat pox diseases in the Amhara region in particular and at a national level in general.

Khaskheli *et al.*, (2017) found peste des petits ruminants is a highly contagious viral disease of small ruminants, caused by Peste des Petits Ruminants virus (PPRV), spreading worldwide in these days. Thus, current study was planned to check the prevalence percentage of PPR in small ruminants especially in goat and sheep surrounding the urban areas of Hyderabad district of Pakistan. A total of two hundred goat (n=200) were examined during study period. The highest prevalence percentage was observed for PPR (35%) followed by respiratory tract infection (17%), urine incontinence (10%), tympany (9.5%) and indigestion (6%). The prevalence percentage of fracture (1.5%) was lowest among all followed by retained placenta (2%), dystokia (2.5%), mastitis (3%) and abortion (3.5%).Where as, wound (4.5%) and enterotoxaemia (5.5%) showed moderate prevalence. Similarly, a total two hundred sheep (n=200) were examined and prevalence of different disorders in sheep was found quietly different from the goat. The PPR appeared to be most prevalent problem (30%) in sheep too followed by indigestion (15.5%), respiratory tract infection (13.5%), tympany (12.5%) and wound (7.5%). Fracture appeared as least prevalent problem (1%) followed by dystokia (1.5%), retained placenta (3%), mastitis (3.5%) and abortion (5%). The moderate prevalence was of enterotoxaemia (7%); where, as prevalence of urine incontinence was recorded zero (0%). Overall Prevalence percentages of different disorders in both species indicate that PPR (32.5%) appeared as most prevalent disease followed by respiratory tract infections (15.25%), tympany (11%), indigestion (10.75%) and enterotoxaemia (6.25%). Furthermore; fracture appeared as least prevalent complaint (1.25%) followed by dystokia (2%), retained placenta (2.5%), mastitis (3.25%) and dystokia (4.25%).As for as urine incontinence (5%) and enterotxaemia (6.25%) are concerned, their prevalence was found moderate. No doubt PPR is one of the major emerging issues for small ruminant production therefore current study was planned to provide proper baseline information so that infected heads could be identified on very early stage for their timely cure and prevention.

Bilgic *et al.*, (2017) observed tick-borne haemoparasitic diseases (TBHDs), caused by Theileria, Babesia, Anaplasma and Ehrlichia, are common in regions of the world where the distributions of host, pathogen and vector overlap. Many of these diseases threaten livestock production and some also represent a concern to human public health. The primary aim of this study was to determine the prevalence of the above-mentioned pathogens in a large number of blood samples (n = 1979) collected from sheep (n =

1727) and goats (n = 252) in Turkey. A secondary aim was to assess the diagnostic sensitivity of a number of species-specific polymerase chain reaction (PCR) tests and the reverse line blotting (RLB) assay. DNA samples were screened using species-specific PCR for the presence of Theileria ovis, *Theileria sp*. MK, *T. lestoquardi*, *T. uilenbergi*, *T. luwenshuni*, Babesia ovis, Anaplasma ovis and A. phagocytophilum while RLB was undertaken to test for the presence of all known Theileria, Babesia, Anaplasma and Ehrlichia species. The diagnostic sensitivity of these two approaches was then compared in terms of their ability to detect single species and mixed infections. Overall, 84 and 74.43% of the small ruminants sampled were identified as hosting one or more pathogen(s) by species-specific PCR and RLB respectively. The presence of *Theileria sp*. OT1, *T. luwenshuni* and *T. uilenbergi* in Turkey was revealed for the first time while the presence of Babesia motasi, *B. crassa* and *T. separata* in Turkish small ruminants was confirmed using molecular methods. A high prevalence of mixed infection was evident, with PCR and RLB approaches indicating that 52.24 and 35.42% of animals were co-infected with multiple species, respectively. More than 80% of the mixed infections contained T. ovis and/or A. ovis. The RLB approach was found to be capable of detecting mixed infections with species such as *Theileria sp*. OT1, *Theileria sp*. OT3, *T. separata*, *B. crassa* and *Babesia spp*. The results indicated that pathogens causing TBHDs are highly prevalent in sheep and goats in Turkey.

Atai *et al.*, (2017) studied was conducted from July to November 2015 to estimate the prevalence of anti-toxopalsma antibodies in sheep and goats in El-Gadarif state. A total of 400 serum samples comprising of 200 sheep and 200 goats were collected and tested by Toxo-latex agglutination test and indirect enzyme linked immunosorbent assay (iELISA). The overall sero-prevalence was 52.0% (n=208/400) using Toxo-latex agglutination test and 45.7% (n=42/92) and 27.2% (n=25/92) using iELISA in sheep and goats, respectively. Furthermore, the sero-prevalences among the two investigated species and the two age groups were statistically similar but were different between localities, breeds and sexes. In the univariate analysis, species (P=0.028) and locality (P=0.001) were associated with Toxo-latex agglutination test positive status. Additionally, species (sheep) and locality (Al-Fao, Al-Hawatah, and West El-Gadarif) had increased odds of being Toxo-latex agglutination test positive in the multivariate analysis. It can be concluded that the prevalence of anti-toxopalsma antibodies is relatively high and there was no between-species variation in seropositivity. These

findings warrant further investigations to estimate the burden of the disease and the likelihood of zoonotic transmission.

Khodakaram and Hashemnia (2017) found intestinal coccidiosis is one of the most important parasitic diseases of small ruminants worldwide. Several Eimeria species including *E. arloingi*, *E. ninakohlyakimovae* and *E. christenseni* in goats and *E. ovinoidalis*, *E. ahsata* and *E. bakuensis* in sheep are the most pathogenic. The disease is more serious in 4-6-month old kids and lambs and also when animals of any age are kept under conditions of intensive husbandry. Stress factors such as weaning, inclement weather, dietary changes, traveling and regrouping have important roles in small ruminant coccidiosis. The pathogenesis comprises three phases including one or more generations of asexual multiplication by merogony, sexual reproduction by gamogony, and asexual reproduction by sporogony. The most common gross lesions are multiple small pale nodules 1-2 mm in diameter on mucosa of small intestines especially jejunum and ileum. In advanced cases, multifocal to coalescent thickening, folding or corrugating to pseudoadenomatosis of the intestinal mucosa associated with numerous well-raised whitish nodules are seen that may be the result of mitogenic stimuli of progamonts. The main histopathologic lesions are papillary hyperplasia of villi epithelium associated with the presence of intracytoplasmic developmental stages of the parasite and infiltration of inflammatory cells. Accurate diagnosis of clinical and subclinical infections and prompt treatment, control and prevention is quite necessary for preventing of great economic losses of this disease in the herds.

Ahmed *et al., (*2017) studied was conducted to identify types of tick species and determine the Prevalence of tick infestation in small ruminants in and around Dire Dawa Administrative council, Eastern Ethiopia. Collection and identification of the ticks were undertaken from November 2014 to May 2015. The overall prevalence of tick infestation in the study area was 278 (72.39% /384). All visible individual adult ticks were collected from the body of 196 goats and 188 sheep. The prevalence of tick infestation in goats and sheep was found to be 73.9% and 70.7%, respectively. In this study, eight species of ticks, which grouped under fmy genera, were identified.

Vihol *et al.,* (2017) serum samples from 126 clinically ailing goats showing signs like anorexia, fever, oligolactia, mastitis, icteric mucous membranes and abortion from different villages of Navsari, Surat, Tapi and Valsad districts of South Gujarat were

examined for antileptospiral antibodies by microscopic agglutination test (MAT) using 17 serovars. Among screened goats, seropositivity was found to be 14.29 %. Seroreactivity was noted against serovars Hardjo, Canicola, Pomona, Pyrogenes, Bankinang, Grippotyphosa, Patoc1 and Australis. Female goats showed comparatively higher seropositivity than male goats. Age wise leptospiral seropositivity was found to be higher in goats above 3 years of age. Present result suggests leptospirosis in goats and also indicates circulation of reported serovars in south Gujarat.

Mustafizur *et al., (*2017) studied was conducted to determine the prevalence of clinical diseases and disorders in goats at Jhenaidah Sadar upazilla, Jhenaidah, Bangladesh. A total of 120 sick goats were examined during the period from September to November, 2015. The presumptive diagnosis of the diseases was performed on the basis of history, owner's complaints, clinical findings and physical examination of patients. Among the diseases and disorders, parasitic infestation 34 (28.33%) case were highest in all cases. On the other hand, non specific fever 25 (20.83%), anorexia 14 (11.67%), peste des petits ruminants (PPR) 10 (8.33%), Gid disease 3 (2.5%), Diarrhea 5(4.17%), Myiasis wound 7(5.83%), Bloat 4(3.33%), Navel ill 2(1.67%), Pneumonia (5.83%), Vitamin and mineral deficiency 4(3.33%) and Dystocia 5(4.17%) were also recorded. It was also reported that adult (62.5%), female (66.67%) and Black Bengal goats (89.16%) were showed more susceptible to diseases than young (37.5%), male (33.33%) and Jamunapari (10.83%) goats. These results of the study might be helpful to develop effective prevention and control strategies against diseases and disorders in goats.

Teferi *et al.*, (2016) studied of small ruminant's mange mites was conducted in the three agro-ecological zones of Wolaita zone, Southern Ethiopia from November 2011-April 2012. The study aimed to determine the mange mite prevalence and to identify the main species infesting small ruminants. A total of 300 small ruminants (155) goats and 145 sheep) were examined for mange mite infestation, by using simple random sampling method. From these, 14 animals (9 goats with the prevalence of 5.8% and 5 sheep with the prevalence of 3.45%) were positive for mange mites with the overall prevalence of 4.67%. The species of mange mites identified in the current study were Sarcoptes (2.67%), Demodex (1.33%), and mixed (Sarcoptes and Demodex) 0.67%. The prevalence of Sarcoptes was higher in goats and in lowland than in sheep and midlands and highlands. However, the prevalence of mange mites across risk factors like agro-

ecology, sex, species, age group, body conditions and body sites was not statistically significantly different (p>0.05).

Lucky *et al.*, (2016) researched work 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) gyneco-obstetrical (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 prevalence's 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. This research work is a groundwork which may facilitate the potential researchers to investigate the details possessions for extensive therapeutic exercises in Bangladesh particularly in Sylhet region for designing the control strategies and conducting the treatment of infection and disorders in cattle and goats.

Rajasokkappan and Selvaraju (2016) studied the prevalence of anaplasmosis infection in goats of Ramanathapuram district of Tamil Nadu for the period from September 2015 to February 2016. Total of 130 blood smears were collected from goats flocks reared in and around Melakidaram village of Ramanathapuram district with the history of dullness, severe dehydration, tick infestation, and anorexia. Clinical examination revealed that all animals were anaemic with pale mucous membrane and watery blood and all animals were highly infested with *Rhipicephalus* species. Blood smears were subjected on Giemsa stained and examined under light microscope. Out of 130 smears, 34 were found to be positive for anaplasmosis with the per cent positivity of 26.15. Age wise prevalence indicated that 8(19.04%), 21 (28.37%) and 5 (35.71%) goats were found to be positive under less than six months, 6 months to one year and above one year, respectively. All the suspected goats were responded to the treatment with tetracycline @ 20 mg/kg body weight and haematinics. The present study emphasis the stake holders should take appropriate measures to control the tick population and also institute the chemoprophylaxis before onset of monsoon season.

Sharma (2016) conducted a study to determine the prevalence of Brucellosis in goats and in humans around border areas of Jammu, J&K, India using different serological tests viz. RBPT, STAT and I-ELISA. A total of 425 serum samples, 350 from goats and 75 from humans were tested by RBPT, STAT and I-ELISA. Overall sero-prevalence of 1.14%was recorded in goats. Higher prevalence rates in 6-9 yr age group in goats (1.42%, 2.85% and 8.57%) were obtained by RBPT, STAT and I-ELISA, respectively. Goats of unorganized sector observed higher prevalence compared to organized sector, where as sex-wise the females had higher prevalence than males. In humans, overall prevalence of 1.33% was recorded. Age-wise 36-50 yr persons while sex-wise males had higher prevalence. Upon odd ratio analysis in goats, 1-2yr age group of animals was most susceptible. In humans, persons of 36-50 yr age group were most susceptible. Among serological tests I-ELISA was found to be most sensitive detecting maximum number of sera samples in both, goats and human beings.

Bauman *et al.*, (2016) para tuberculosis (Johne's disease) is a chronic, enteric wasting disease of ruminants, caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP). Previous research and control strategies in Ontario have focused on dairy cattle because of their agricultural importance and the proposed association between MAP and Crohn's disease in humans. MAP has also been detected in goat and sheep milk/food products in Europe and Mexico .Sporadic cases of Para tuberculosis have been diagnosed in sheep and goats in Canada and, in the province of Quebec, a prevalence of 3% was detected in cull sheep and 10.5% in a goat mortality study. Demand for goat and sheep milk-based products is increasing in North America and these dairy industries have grown rapidly in Ontario. With this growth comes increased scrutiny from a food safety and welfare standpoint and an increased need for research on production-limiting diseases. Before resources can be allocated appropriately, however, accurate and relevant prevalence data must be determined. Para tuberculosis often goes unrecognized in small ruminant species due to a lack of producer awareness, poor sensitivity of diagnostic tests at the individual animal level, and clinical similarity to other wasting diseases. Furthermore, small ruminants exhibit diarrhea in only 20% of cases, in contrast to cattle in which intractable and profuse diarrhea is a main clinical sign. As there is no pathognomonic sign for Para tuberculosis in small ruminants, the infection may be well-established in a herd before the first case is diagnosed. The transmission of MAP is mainly fecal-oral; infectious animals shed the bacteria in their feces and contaminate the environment, feed, water,

and skin surfaces. Infection is often contracted early in life, but it may take 2 to 14 day before the clinical disease appears, depending on the dose of MAP ingested, species, and within-farm prevalence. During this period of latency, antemortem diagnosis is challenging. As an animal progresses from infected to infectious to diseased, antibody titers can fluctuate and fecal shedding can be intermittent .Even when animals are shedding, it is challenging to detect the bacterium in feces by means of culture or polymerase chain reaction (PCR) .In summary, there is no perfect antemortem test and most such tests demonstrate low sensitivity and test performance (i.e., sensitivity and specificity), can vary by farm contingent based on factors such as the age distribution in the herd and stages of infection present.

Saminathan *et al.*, (2016) endangered by different endemic infectious diseases (bacterial, viral, protozoan and parasitic), which collectively causes significant economic losses to the landless poor farming community. Infectious diseases impose economic losses by causing morbidity, mortality, decreased production (milk, meat, wool etc.), decreased feed conversion ratio which results in reduced weight gain, decreased draught power and fertility. Furthermore, economic burden is also due to the cost of treatment, abortion, consequences on internal livestock movement, germplasm and international trade. In addition, some of the diseases are zoonotic and inflicts considerable impact on public health. Uncertain agrarian climate, unpredictable weather, drought, floods, migration of livestock, scarcity of fodders, and unhygienic zoo-sanitary and healthcare practices together resulted in endemicity of diseases ultimately leads to more incidence and prevalence of livestock and poultry diseases throughout the year. Synchronized monitoring and surveillance of disease throughout the country is a fundamental requirement for sustainable livestock production. With fairly developed telecommunication in India, following technologies like interactive voice response system, SMS through mobile/cell phones and toll-free landline phones (voice mail) are required for enhancing the effectiveness and efficiency of disease monitoring and surveillance. Multidisciplinary approaches at international, national and local levels are required for management, control and eradication of endemic and transboundary diseases of livestock. Improved monitoring and/or surveillance, rapid and confirmatory diagnosis, and networking of diseases are required to go forward in the path of eradication. Vaccination is the main strategy for control and eradication of many diseases. Good management practices consisting of stringent biosecurity measures, strick sanitation and

hygiene practices in the farm, isolation and quarantine of diseased animals, and trade restrictions are necessary for successful operation of control programmes. This review highlights prevalence, pathogenesis, diagnosis, and prevention and control measures for important diseases of ruminants with special reference to India.

Gupta *et al.*, (2016) studied highlights the seroprevalence of Contagious Caprine Pleuropneumonia (CCPP) in goats using slide agglutination test. A total of 1427 serum samples from goats belonging to Jabalpur district of Mahakaushal region of Madhya Pradesh were screened over a period of one year (i.e. April 2014 to March 2015). All the samples were screened for CCPP antibodies by slide agglutination test (SAT) using colored CCPP antigen. The overall seroprevalence of Contagious Caprine Pleuropneumonia in goats was 10.65 per cent (152 out of 1427 goats). Seroprevalence of CCPP in organized goatry was higher (i.e. 13.54 %) than the unorganised sector of goatry (i.e. 9.01 %). Sex wise seroprevalence was marginally higher in female (10.67 %) than the male (10.61 %). SAT for CCPP detection using colored antigen was found to be quick, simple and low cost with ease of application in field condition without the need of any specialized training and equipment.

Brahma *et al.*, (2015) caused of gastroenteritis by helminth parasites is a major hindrance for optimum productivity in small ruminants. The present study was conducted to determine the prevalence of gastrointestinal parasites (GIP) and intensity of gastrointestinal nematode (GIN) infection in Black Bengal goat of Sundarban Delta of South 24 Parganas district in West Bengal. A total of sixty goats in the age group of three months to one year were selected and coprologically screened by Standard technique for a period of one year (from Nov. 2012-Oct. 2013). The overall prevalence of GIP infection was 73.34%. Highest overall prevalence (81.67%) as well as intensity of GIN infection (606.5) was observed in monsoon and lowest prevalence (68.33%) and intensity (361.5) was recorded in summer. Haemonchus contortus was recorded as the predominant gastrointestinal parasite species with an overall prevalence of 63.25%. The results of the present study might be exploited for developing strategic control measures against naturally occurring GIP in black Bengal goat of Sundarban Delta.

Ali *et al.*, (2015) performed out the infestation rate of Ixodidae ticks in domestic ruminants in Ilam County during 21 March 2009 to 23 August 2009. Sampling was performed in 25 villages and 15 anima farm from different areas of this County. A total

of 1, 316 ticks were collected from 416 cattle, 208 sheep and 147 goats. The overall prevalence of ticks was recorded: 43, 23.5, and 49/6 % in cattle, sheep, and goats respectively. The number of ticks that collected from cattle, sheep, and goat were 328, 573, and 415 respectively. In this survey the ticks distribution on the body surface of infested ruminants the highest infestation was found in the udder and tail (21 %) in cattle, ear (42.5 %) and tail (30 %) in sheep and ear (63 %) and tail (17 %) in goats. The lowest number of ticks in body surface of ruminants was observed in the ear and shoulder (2 %) in cattle, head and neck (2 %) in sheep and udder (7 %) in goats.

Siddiki *et al.*, (2015). An investigation was undertaken to determine the general clinical prevalence of diseases and disorders in cattle at the Upazilla 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 was 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%), anestrous (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). It may be concluded that a number of diseases with various percentages have been occurring in the Chauhali upazila and this report may help to develop control strategies against major diseases reported in this study.

Yadav *et al.*, (2015) studied the prevalence of sub -clinical ketosis in goats of Guwahati and nearby area of Assam. Blood samples from pregnant and lactating goats were

collected to measure ketone and glucose level with the help of ketone meter and commercially available kit respectively for classifying animal as ketonic. Goats having blood ketone >0.4 $mmolL^{-1}$ and glucose <30 $mgdl^{-1}$ were considered positive for subclinical ketosis. The overall prevalence was 14.29%. Higher prevalence was found during pregnancy (15.48%) than lactation (10.91%). During pregnancy higher prevalence was found during winter (22.9%) than monsoon (8.64%). During lactation higher prevalence was found during post-monsoon (12.50%) than pre-monsoon (9.68%). The highest prevalence was observed in goats of 3.4 years (36.11%). The prevalence of sub-clinical ketosis was found to be highest in Beetal (58.33%). Sub -clinical ketosis was recorded mostly in pregnant animals than lactating animals.

Adang *et al.*, (2015) conducted to determine the prevalence of ectoparasites of sheep and goats in Gombe between March and June 2011. A total of 312 animals comprising of 155 sheep and 157 goats were examined and using the hand picking and hair brushing methods, ectoparasites present on the animals were collected. Of the 312 animals examined, 30 sheep representing 19.4% and 22 goats representing 14.0% were infested. The ectoparasites identified on sheep were Lice: Damalinia ovis 6 (3.9%), Ticks: Rhipicephalus sp. 5 (3.2%), Amblyomma sp. 9 (5.8%), Boophilus sp. 10 (6.5%) and Fleas: Ctenocephalides felis 8 (5.2%). The ectoparasites identified on goats were Lice: Damalinia ovis 6 (3.8%), Ticks: Rhipicephalus sp. 8 (5.1%), Amblyomma sp. 2 (1.3%), Boophilus sp. 5 (3.2%), Ixodes ricinus 3 (1.9%), Hyalomma sp. 4 (2.5%) and Mites: Sarcoptes scabiei 3 (1.3%). Ectoparasite infestations were higher in young animals; 11 (19.6%) in sheep and 15 (22.7%) in goats than in adult animals; 19 (19.2%) in sheep and 7 (7.7%) in goats. Female animals of 21 (24.1%) sheep and 17 (22.4%) goats were more infested than male animals of 9 (13.2%) sheep and 5 (6.2%) goats. Single infestations recorded in 22 (14.2%) sheep and 13 (8.3%) goats were higher than double infestations recorded in 8 (5.2%) sheep and 9 (5.7%) goats. The highest mean ectoparasite burden was 14.0±1.2 per host and the lowest mean ectoparasite burden was 1.6±1.9 per host in both sheep and goats. Chi square test revealed no statistically significant differences in the prevalence of ectoparasite infestations between sheep and goats, in age of sheep and goats, in sex and age of sheep, in single and double infestations of sheep and goats ($p>0.05$) but revealed statistically significant differences in sex of sheep and goats, in sex and age of goats ($p<0.05$). The study concludes that ectoparasites are common to both

sheep and goats in Gombe and could affect their health and productivity as well as their economic and market value.

Miller *et al.*, (2015) studied was conducted to determine the presence of brucellosis in cattle, goats and humans in farms from south-western Uganda and identify risk factors associated with brucellosis in these three host groups. Data and serum samples were collected from 768 cattle, 315 goats and 236 humans, with 635 samples of bovine milk, from 70 farms in two different study areas in south-western Uganda. Sera from livestock were tested with the Rose Bengal Plate test, using *B. abortus* and *B. melitensis* antigens, and human sera were tested with a commercial IgG/IgM lateral flow assay. Milk samples were tested using the OIE-approved milk ring test. Screening tests for brucellosis were positive in 14% of cattle serum, 29% of bovine milk, 17% of goat serum and 11% of human serum samples. There were significant differences in the test prevalence of brucellosis by study site, with levels higher in the study area near Lake Mburo National Park than in the study area near Queen Elizabeth National Park. Multivariable regression models identified risk factors associated with increasing test positivity at the individual and farm levels for cattle, goats and humans. Positive associations were seen between increasing seropositivity of brucellosis in goats, cattle and humans. Results of multivariable analyses suggest that improvements in farm biosecurity and hygiene may reduce the risk of brucellosis on the farm and suggest a role for ticks in bovine brucellosis. Although cattle are the focus of brucellosis control in Uganda, the significant associations between seropositivity in humans and seropositivity in goats suggest that brucellosis in goats may be an important contributor to the epidemiology of the disease on the farm.

Olanike *et al.*, (2015) studied on the gastro intestinal parasites of goats was carried out for six months from May to October, 2014 in Ibadan, South Western, Nigeria. Fmy hundred (400) goats' faecal samples comprising of 103 West African Dwarf and 297 Red sokoto breeds were collected from goats in households, market places and abattoir. They were examined for intestinal helminth eggs and protozoan oocysts using direct microscopic examination and sodium chloride floatation technique. Out of the 400 faecal samples examined, 303(75.75%) were positive for gastrointestinal parasites. The Red sokoto breed had a higher prevalence of 217(54.25%) while West African dwarf breed had the lower prevalence of 86(21.5%). Male goat had a prevalence of 163(40.85%) while female had a prevalence of 140(35%).

Das *et al.*, (2015) gastrointestinal (GI) parasitism in animals is one of the major problems in India causing emaciation, anaemia, oedema, weakness, diarrhoea and death. Present study was designed to generate epidemiological data on GI parasitism of goats of Madhya Pradesh, India. During 8 months study period, a total of 960 samples were collected and examined by sedimentation and floatation methods followed by egg per gram out of 960 samples, 907 (94.48 %) were positive for one or more gastrointestinal parasite, wherein coccidia was predominant (82.4 %) followed by strongyles (69.27 %), amphistomes (22.71 %), Strongyloides sp. (9.17 %), Trichuris sp. (3.85 %), Moniezia sp. (3.02 %), Schistosomes sp. (2.29 %) and Fasciola sp. (1.77 %). The seasonal incidence was found highest in monsoon (98.06 %) and lowest in winter (91.67 %). The incidence of gastrointestinal parasitism was found higher in kids (96.25 %) in comparison with adult goats (93.89 %).

Alam *et al.*, (2015) conducted the study was conducted at Upazila Livestock Development Centre, Kapasia, Gazipur, during July, 2011 to December, 2011 to identify and determine the prevalence of clinical diseases and disorders of goats. A total number of 488 clinical cases of goats were recorded. Diagnosis of the clinical cases of goats was based on general examination (history and owner's complaint), physical examination of patient (inspection, palpation and percussion), clinical examination, microscopic examination and using common laboratory techniques. The clinical cases were divided into three groups on the basis of treatment required-medicinal, gynaeco-obstetrical and surgical cases. Among the three types of cases, medicinal cases 428(87.72%) were highest followedsurgical cases 43(8.80%) and gynaeco-obstetrical cases 17(3.48%). Among the medicinal cases of goats, the contagious diseases PPR 32(6.56%), black quarter 23(4.73%) fascioliasis 77(15.78%), diarrhoea 35(7.17%), dysentery 30(6.15%), ectoparasitism 30(6.15%), paramphistomiasis 25(5.12%), gastrointestinal nematodiasis21 (4.3%), fever 20(4.1%) were recorded major disease problems in goats. Among the gynaeco-obstetrical cases, retained placenta 5(1.02%) and repeat breeding 12(2.46 %) were recorded as major gynaeco-obstetrical problems in goats. Abscess 9(1.84 %), castration 4(0.81%), myiasis 10(2.05%), navel-ill 7(1.43%), gid disease 2(0.41%), urolithiasis 5(1.02%) and fracture 6(1.23%) were recognized as the main disorders which required surgical interventions. It may conclude that a number of diseases have been occurring in goats at study area and this report may help to develop strategies against major diseases reported in this study.

Tariba *et al.*, (2015) prevalence of Caprine Arthritis Encephalitis Virus (CAEV) and occurrence of clinical arthritis were investigated on 543 goats of French Alpine breed on six intensive production farms in North-Western Croatia. The aim of the study was to determine seropositivity to CAEV and to examine the occurrence of clinical arthritis in relation to CAEV seropositive goats. All goats were examined clinically and presence of arthritis was noted. The blood samples were tested for antibodies against CAEV using the immunoenzyme test. All collected data were cross-classified in two-way contingency tables. Of the total number of goats, CAEV was serologically confirmed in 50.8% and 31.6% of all goats were diagnosed with clinical arthritis. CAEV seropositive goats were 21.9% and they also expressed clinical signs of arthritis. Statistical tests confirmed positive association between clinical arthritis diagnosis and seropositivity to CAEV with Phi coefficient of 0.25 ($P<0.01$). Results suggest that serious eradication programs should be introduced in north western Croatian goat herds, but also that further investigations in all Croatian herds should be conducted and measures should be applied on all herd.

Teshome and Samuel (2015) carried out a cross sectional study was carried out during the period between November, 2013 to April, 2014 to determine the prevalence of major skin disease and to identify the dominant risk factors for this disease in Gondar university veterinary clinic. A total of 1296 ruminants that came to the Clinic were involved in the study. Out of this 513(39.6%) cattle, 631(48.7%) sheep and 152(11.7%) goat was included. Skin scraping, morphological identification and clinical presentation were the methods employed for identification of mange mites and Dermatophilosis, gross ectoparasites and viral skin disease respectively. 468(36.1%) were infested with one or more skin diseases. The prevalence of skin diseases in cattle, sheep and goats were 142(27.68%), 268(42.47%) and 58(38.12%) respectively. The difference in the prevalence of skin diseases among the three host species was statistically significant ($p<0.05$). The major skin diseases identified on ruminants were tick 116(8.95%), mange 31(2.39%), lice 91(7.02%), sheep ked 72(5.56%), lumpy skin disease 29(2.24%), Dermatophilosis 9(0.69%), orf 45 (3.47%) and sheep and goat pox 77(5.94%).The prevalences of ectoparasites at genus level were tick (Boophilus Hyalomma, Amblyomma and Rhipicephalus), mange mite (Demodex, Sarcoptes and Psoroptes) and Lice (Damalina and Linognathus). The difference in the prevalence of skin disease infestation between poor and good body condition was statistically significant in

ruminants (P<0.001).The predilation site of skin disease were tick in hairless area, mange mite and lice in neck and head areas, Dermatophilosis on the back, orifice in face region of, sheep ked in hairy parts of sheep, lumpy skin disease and sheep and goat pox in whole body parts of cattle and small ruminants. The study demonstrates that skin disease is among the most important health constraints of ruminants in and around Gondar town, hence requires immediate attention and control interventions.

Suryawanshi *et al.*, (2014) studied the prevalence of brucellosis in sheep and goats, a total of 181 and 164 serum samples were collected from apparently healthy sheep and goats respectively of different age and sex from fmy districts of Maharashtra. All the samples were screened for brucella antibodies by employing RBPT test. An overall prevalence of 7.32% and 17.68% was observed in goats and sheep respectively. District wise prevalence indicated 15.00 % prevalence of brucellosis in goats in Akola district followed by Sangli (7.50%), Nagpur (5.00%) and Nashik (2.30%) and 20.00% prevalence of brucellosis in sheep in Nashik district followed by Nagpur (19.50%), Akola (18.33%) and Sangli (12.50%).Age wise prevalence indicated 21.43% prevalence in sheep between 2-3yrs and10.17% in goats above 3 yrs of age. Sex wise seroprevalence indicated prevalence of 25.00% and 24.00% in male sheep and goats respectively and 17.16% and 4.32% in female sheep and goats respectively. From the present study it is concluded that brucellosis is endemic in India. Further studies are required to reveal the complete scenario of sero prevalence of the brucellosis in Maharashtra.

Rahman *et al.*, (2014) prevalence of parasitic diseases in Pirgonj of Rangpur district was studied from January to December 2010. One hundred and forty goats of different ages in different seasons were investigated for parasitic diseases. The disease was diagnosed by clinical and physical examinations. The faeces were examined by direct smear method following concentration by sedimentation and floatation techniques in order to identify gastro intestinal parasites. Other endoparasitic diseases were diagnosed on the basis of specific symptoms. The goats were also examined for ectoparasitic infestation. The ectoparasites were collected by hand picking or by using hair brush and examined under microscope for morphological studies. The results revealed that the overall prevalence of endoparasitic diseases was60.71% and ectoparasitic diseases 15.71%. Adults are more susceptible for both ecto and endo parasitic infestation. Overall prevalence of endoparasitic diseases was found higher in rainy season and ectoparasitic infestation in summer season. The study make attention that the goats in Pirgonj

suffering from a number of parasitic diseases and suggests that treatment and control measures should be taken to keep the goat population out of parasitic diseases.

Parvez *et al.*, (2014) teaching Veterinary Hospital (TVH) in Chittagong Veterinary and Animal Sciences University (CVASU) played an important role of public service to animal welfare since the period of 1996. There are lots of goats and cattle are recorded in this hospital every year but previously no report published on it. So this research was conducted 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 (goats3.99% 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 orthopaedic (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. So that an appropriate control strategy has to be designed and applied, which helps to prevent of these disease conditions in study area.

Nath *et al.*, (2014) goat is an important source of nutrition and integral part of rural economy in Bangladesh. Goats are affected by several infectious diseases which can affect their growth. This study was conducted to investigate the prevalence of common infectious diseases of goat in Chittagong district of Bangladesh. The study was carried out in S.A Quaderi Teaching Veterinary Hospital, CVASU, and Chittagong in between November 2011 to October 2012. The diseases were diagnosed on basis of clinical signs,

owner's statement and laboratory diagnosis. The prevalence of Peste des Petis of Ruminant (PPR) was highest (11.33%) whereas babesiosis was less common (0.40%). The prevalence of infectious disease was highest in 13-18 month age group (68.00%) and lowest at 19-24 month age group (53.73%). The prevalence of infectious disease was highest at Black Bengal breed (64.23%) and lowest in Jamunapari cross (57.39%). Prevalence of PPR was found highest both for male and female goat. Highest percentage was observed in case of mixed infection (49%) and lowest in case of fungal infection (4%). Occurrence of various infectious diseases was higher in rainy season (36.43%) followed by winter season (34.94%) and summer season (28.62%). Female goat was found to be more susceptible (64.22%) than the male animal (35.77%). These results indicate the high incidence of various infectious diseases in the goats of Chittagong region. Thus, there is a need for an immediate action by the veterinary workers, development partners to come forward in order to prevent and minimize the loss caused by infectious diseases in goats.

Soundararajan *et al.*, (2014) prevalence of tick infestation and their predilection sites was studied in goats (non-descript, Kanni and Boer x non-descript crossbred) under different system of management at Livestock Research Station, Kattupakkam, Tamil Nadu, India. The ticks were recovered only on the goats under semi-intensive system (100%) whereas the goats under intensive system were free from the tick infestation. The most abundant species found in this study were Haemaphysalis bispinosa (100%), Hyalomma marginatum isaaci (7.29%), Rhipicephalus haemaphysaloides (3.13%) and H.anatolicum anatolicum (2.08%). Among the infested goats, females were heavily infested (78.64%) than the males (51.52%). Among the age groups, the hogget animals were heavily infested (83.87%) followed by adults (71.43%). Among the breeds, non-descript goats were heavily infested (94.29%) followed by Kanni goats (90.91%) and Boer x non-descript cross breeds (51.56%). Ticks were located mostly on the ears (69.79%) than the other parts of the body (30.21%).

Desalegn *et al.*, (2014) studied around Kombolcha, south wollo, north east Ethiopia from November 2007 to April 2008 to determine the extent of ectoparasite problem in small ruminants. A total of 1638 (685 sheep and 983 goats) were examined for the presence of skin lesion that is indicative of ectoparasites. The relation between prevalence rate of ectoparaites in relation to species, sex and age was determined. Different species of ectoparasites were identified in both sexes and different age groups in sheep and goats.

Out of these examined animals 460 (190 sheep and 270 goats) were found with skin lesion of a total 190 sheep with skin lesion 88.4% were positive for one or more species of ectoparasites which out 270 goats with skin lesion 100% were infested with various ectoparasites. The major ectoparasites prevailing in the area and registered in this study were mange 2.7% in sheep and 5.7 in goats, tick 7.35 in sheep and 13.7% in goats, lice 21.7% in sheep and 34% in goats and flea 7.3% in sheep and 8.2% in goats. There was no significant ($p>0.05$) difference in the prevalence rate of all the ectoparasites infestation between sheep and goats although higher infestation rate was found in goats than sheep in all ectoparasites. The prevalence rate of mange in goats and lice and flea in sheep was significantly ($p<0.05$) associated with age. No statistically significant ($p>0.05$) difference in the prevalence of all the ectoparasites between male and female. Based on the questionnaire summery 126 (84%) of the 150 respondents considered ectoparasite as an important problem in small ruminant production in the study area. Out of which 107(71.3%) were found to know problems caused by ectoparasites, 66(44%) have knowledge on seasonal occurrence of ectoparasites and 124 (827%) were found to explain made of transmission of ectoparasites. Based on the findings, effort should be made to control ectoparasites so as to ensure quality of skin and prevent economic loss attributable to skin lesions.

Tsegaye *et al.*, (2013) designed the study to investigate economically important goat diseases in Hararghe Zone, Eastern Ethiopia. A stratified single-visit multiple subject formal survey was conducted indifferent agro ecological zones in Daro-labu districts of western Hararghe using structured questionnaires together with PRA tools to collect information. One hundred eighty households were randomly selected for this study. The data were analyzed using descriptive statistics and ranking techniques. The study indicated that Pest des Petit Ruminants, pasteurellosis and anthrax were the first, second and third top devastating diseases causing high mortality and morbidity with an index of 0.42, 0.25 and 0.20, respectively. Disease, predators and abortion were the top three causes of goat death with indices of 0.45, 0.3 and 0.13, respectively. Preweaning mortality of male and female kids in last 12 months were 2.1 and 2.5, respectively in local areas; whereas in midland it was 0.6 for male and 1.5, for female and in highland the corresponding pre-weaning mortality was 0.3 and 0.4 for male and female, respectively. Mortality was significantly higher in lowland agro ecologies where there

are minimal infrastructures. The higher mortality rates observed in this study directs the need for better management and disease control practices.

Farougou *et al.*, (2013) aimed the study to determine the prevalence of peste des petits ruminants in the arid zone (Niamey, Tillabéry and Tahoua) of the Republic of Niger. A serological survey was conducted and 519 serum samples were collected from 253 unvaccinated sheep and 266 unvaccinated goats. The sample included 340 female animals (168 sheep and 172 goats) and 160 kids and lambs (78 lambs and 82 kids). A competitive enzyme-linked immunosorbent assay yielded an overall seroprevalence of 45.0%. The prevalence in sheep was 42.0% compared with 47.9% in goats. The seroprevalence observed amongst small ruminants in Tahoua (49.8%) and Tillabéry (46.6%) was significantly higher ($p = 0.001$) than that observed in animals from Niamey (25.1%). It was also higher ($p = 0.04$) in sheep younger than two years (51.8%) than in adults (37.6%). Conversely, the seroprevalence showed no significant difference between male animals (35.8% in sheep; 50.1% in goats) and female animals (45.1% in sheep; 46.4% in goats). The prevalence of the disease observed amongst the sheep and goat populations confirms the continued danger of this disease in the areas studied. It is therefore necessary to develop strategies such as improving livestock services, providing effective vaccines and implementing a vaccination programme for an effective control of the disease in sub-Saharan Africa.

Mulabbi *et al.*, (2013) presence of bluetongue virus (BTV) in indigenous goats from the Karamoja region of northern Uganda was investigated. A total of 300 goats were sampled (serum and whole blood) from five districts within the Karamoja region. The samples were analysed for the presence of bluetongue (BT) antibodies using a commercial Enzyme-linked immunosorbent assay (ELISA) and for the presence of BTV viral RNA by real-time Reverse transcription polymerase chain reaction (RT-PCR), because BTV is an RNA virus. Of the 300 goats tested, 269 (90%) were positive for BTV antibodies, indicating high levels of BTV circulation within the region. Out of the 150 whole blood samples tested for the presence of the virus by real time RT-PCR, 84 (56%) were positive for BTV RNA. This study, which is the first of its kind in Uganda, showed a high seroprevalence of BT antibodies and active circulation of BTV in a high proportion of goats in the Karamoja region.

Sachan and Nautiyal (2013) identified a total of 1500 blood samples from animals including 725 of cattle, 393 of buffaloes, 180 of goats, 202 of dogs and 100 from veterinarians of Rohilkhand region, U.P., India were screened for seroprevalence of brucellosis. Of the two tests employed, STAT detected comparatively higher percentage of seropositive animals (10.2%) as compared to RBPT (9.5%) and 6 veterinarians by RBPT (6%)and 18 by STAT(18%). Highest seroprevalence was found in cattle (11.6%) followed by buffaloes (10.9%), goats (5.0%) and dogs (2.5%). Demographically, the highest seroprevalence of animal brucellosis was seen in Moradabad district (12.4%) followed by Shahjahanpur (11%), Badaun (10%), Pilibhit (9.4%), Rampur (8.6%) and Bareilly (8%) whereas veterinarians of Pilibhit district showed highest seroprevalence rate (25%). Cattle, buffalo and goats showed highest seroprevalence during rainy season whereas dogs during summer season (3.6%). Seasonal pattern of seroprevalence among veterinarians was same as that of animals. In all the animals, seroprevalence was higher in females in comparison to males. In contrast more number of male veterinarians (18.6%) were found positive than the female veterinarians (11.1%). In cattle, buffaloes and goats seroprevalence was higher in adults in comparison to young animals but it was more in young dogs in comparison to adult dog.

Islam *et al.*, (2012) conducted the study was at Upazila Livestock Office from 1st January to 31th March, 2010 to observe the prevalence of PPR in goat at Mirzaganj upazila in Patuakhali District. A total of 183 goats were examined based on the clinical signs and gross pathological lesions of which 92 were PPR affected makes up 50.27%. After categorizing the animals according to their breed, age and vaccination history it was revealed that Black Bengal goats were more susceptible (54.93 %) than Jamunapari (31.38 %). The prevalence of PPR was maximum 63.33% at age category of 7-12 months, in compare with 44.68%, 41.87%, 45.45% at age category of $\leq$ 6 months, 13-18 months and $\geq$ 19 months respectively. Non-vaccinated goats were more susceptible (66.40%) to PPR infection than vaccinated goats (19.56%).Parental (I/M) Oxytetracycline was more effective (64%) than parental (I/M) Sulphadimidine (44%) along with symptomatic treatment. PPR causes higher mortality and heavy economic losses in every year which may be reduced substantially by proper vaccination and other managemental approaches.

Sajib *et al.*, (2012) conducted the present study to investigate the prevalence of pox infection in goats in Pakistan. The skin samples were collected from different locations

of Northern, Arid and Southern regions of Punjab. From northern region, the total number of samples collected from slaughter houses, tanneries, goats and hide markets were 3438, 5038, 2841 and 4135 respectively. From arid regions the total samples number collected were 1873, 935, 3313 and 1110 respectively. From southern regions the total samples collected were 2243, 1758, 3745 and 1045 respectively. The prevalence of capripox virus was highest in arid region followed by southern region and northern regions. The data were analyzed by age and sex on the basis of clinical manifestation and postmortem lesions found in the infected animals. Prevalence was more in adults as compared to the kids. Female goats were more sensitive than male goats. The histopathological examination was performed and the characteristic changes were recorded. For goat pox the prevalence between the regions and samples collecting spots was highly significant ($P<0.05$).

Tesfaheywet *et al.*, (2012) carried out during the period between November, 2011 to March, 2012 to determine the prevalence of sheep and goat mange mite infestation and identify the dominant mange mite in and around Nekemte town, Oromia Regional state, Northwest Ethiopia. A total of 200 sheep and 184 goats that came to Nekemet Veterinary Clinic were included in the study. Skin scraping was the method employed to collect mange mites for identification. Out of 384 sheep and goats examined, 20(5.2%) were infested with one or more mange mites. The overall prevalence of mange in sheep and goats were 4.5% and 9.24% respectively. The difference in the prevalence between the two host species was not statistically significant ($p>0.05$). The major mange mite identified on sheep and goats were genus Sarcoptes and Demodex with prevalence of 3.9% and 2.08%, respectively. Sarcoptes scabiei var caprae (5.43), Sarcoptes scabiei var ovis (2.50) and Demodex caprae (2.70%) and Demodex ovis (1.50%) were the most important species identified in a decreasing order. There was no statistical significance difference ($p>0.05$) in the prevalence of mange mite infestation between age and sex groups in both host species. The difference in the prevalence of mange mite infestation between poor and good body condition was statistically significant in both sheep ($P =23.613$, $p=0.000$) and goats ($P =20.113$, $p=0.000$). 2 2 The lesion of mange mite infestation was observed concentrated on the face and head areas and the dominant lesions were formations of nodules and crusts and also loss of hair and ragged wool/hair. The study demonstrates that mange mite is among the most important health constraints of sheep and goats in and around Nekemte, hence requires immediate attention and

control interventions. Moreover, further epidemiological investigations that consider the agro-ecology and other non-host related risk factors should be carried out for appropriate control of mange mites.

Abunna *et al.*, (2012) conducted to identify tick species and determine the prevalence of tick infestation in small ruminants of Bedelle District, West Oromia Region. Collection and identification of the ticks were undertaken from November 2010 to March 2011. All visible individual adult ticks were collected from the body of 121 goats and 330 sheep. The prevalence of tick infestation in goats and sheep was found to be 66.12% and 80.7%, respectively. In this study, six species of ticks which grouped under three genera were identified. The most abundant species found in this study were Amblyomma coherence (35.25%), *Amblyomma gemma* (17.07%) and *Amblyomma lepidum* (18.48%), *Amblyomma variegatum* (15.96%), *Rhipicephalus evertsi* (2.44%) and *Boophilus decoloratus* (0.89%) *Boophilus decoloratus* is the minor species of tick observed on sheep and none these ticks were recorded in goats in the study area. The difference in the prevalence of tick infestation between sheep and goats was statistically significant (x =9.43, p=0.002) but found to be statistically 2 significant between male and females (x =2.83, p=0.071). Attention should be given to the control and 2 prevention of ticks, since they cause severe damage to the skins of small ruminants and thereby reduce the foreign exchange of the country; they also transmit some diseases which can cause severe loss to the productivity of these animals.

Sarker and Islam (2011) studied was carried out to investigate the prevalence of Peste des petitis ruminants (PPR) in goats in Rajshahi District of Bangladesh, and its relation to age, sex, breeds and seasonal influence. In total, 627 goats were examined where 305 were males and 322 were females. The overall prevalence of PPR in goats was found to be 20.57% (n=129). From the various risk factors analysed, age categories of goats, sex, breed and seasonal influence were found to be significantly associated ($p<0.01$) with the prevalence of PPR. Findings suggested that the seasonal influence on outbreaks of this disease was significantly higher. The clinical prevalence of PPR was highest in the month of December (31.68%) and lowest in June (9.52%). The influence of sex on PPR outbreaks was found to be higher in male (28.52%) than female (13.04%) goats. As regards to age, PPR was significantly higher in young (31.06%) compared to sucklers (13.14%) and adult (10.15%). The susceptibility of Black Bengal goats to PPR was higher than other breeds. The results of this study showed that PPR is an important goat

disease in the studied areas. Thus, an appropriate control strategy has to be designed and applied, which could involve prevention of contact with infected goats and vaccination against the PPR virus.

Hoque *et al.*, (2011) investigated was carried out to measure the prevalence of ecto and endopatasites in semi scavenging black Bengal goat (*Capra hircus*) at Pahartali Thana under Chittagong district, Bangladesh during the period of February to May/2006. The overall prevalence of gastrointestinal helminths in goat were 63.41% (N=317). In these positive samples, *Strongyloides* spp. (51.74%) was more prevalent and *Moniezia* sp. and *Capillaria* sp. were least prevalent (n=201). The gastrointestinal parasitic load of goats varied from egg per gram (epg) 0 to 1600. Faecal sample evaluation shows, 36.95% and 13.56% goats were loaded epg 0 and 300, respectively. Age was evident as risk factor where older goats (> 24 month) were more infected by endoparasites than younger ones (< 24 month) in this study ($p < 0.05$). Irrespective of factors, the prevalence of ecto and endoparasites has been quite high. So, the preventive measurement should be adopted for this goat population. As goats are infected with ecto and endoparasites, broad spectrum anthelmintics might be judicious choice. As older goats are more susceptible than younger ones for endoparasites, the grazing habit should be restricted.

Aguiar *et al.*, (2011) reported the occurrence and epidemiology of outbreaks of foot rot and other foot diseases in goats and sheep in the semiarid region of Paraíba, northeastern Brazil. Fmy farms were inspected for the presence of foot lesion in sheep and goats and for environmental conditions, general hygiene, pastures, and disease control measures. The prevalence of foot lesions was 19.41% (170/876) in sheep and 17.99% (52/289) in goats, ranging between 5.77% and 33.85% in different farms. Foot rot was the most common disease, affecting 12.1% of the animals examined (141/1165), but with significantly higher ($p<0.05$) prevalence in sheep (13.69%) than in goats (7.27%). The frequency of malignant foot rot was also significantly lower ($p<0.05$) in goats (9.53%) than in the sheep (40.83%). On one farm, Dorper sheep showed significantly higher ($p<0.05$) prevalence of foot rot (17.5%) than Santa Inês sheep (6.79%), and the number of digits affected was also higher in the former. *Dichelobacter nodosus* and *Fusobacterium necrophorum* were isolated from cases of foot rot. White line disease was found in 3.95% of the animals, sole ulcers in 1.29%, foot abscess in 1.03% and hoof overgrowth in 0.5%. The high rainfall at the time of occurrence, grazing in wetlands, clay soils with poor drainage, presence of numerous stony grounds, closure of the flocks

in pens at night, and introduction of affected animals were considered predisposing factors for the occurrence of foot diseases.

Kabir *et al.*, (2010) investigated the general clinical prevalence and comparative prevalence of diseases and disorders in cattle and goats at the Upazilla Veterinary Hospital (UVH), Ulipur under Kurigram district during mid October to mid December, 2008. Total animals were 463, among them cattle were 348 and goats were 115. Diagnosis on the basis of general examination, physical examination clinical examination, mycroscopic examination and using common laboratory techniques. Clinical examinations detected 17 different types of diseases and disorders in 348 (75.16% of total animals) cattle. Whereas fever 27 (7.76%), digestive disorders 40 (11.5%), respiratory disorders 21 (6.03%), skin disease 23 (6.6%), foot & mouth disease 125 (35.92%), dysentery 5 (1.44%), black quarter 2 (0.57%), papillomatosis 16 (4.5%), clinical mastitis 4 (1.14%), uterine prolapse 2 (0.57%), Humpsore 10 (2.87%), repeat breeding 4 (1.14), anaestrus 5 (1.44%), fascioliasis 47 (13.51%), paramphistomiasis 5 (1.44%), post castrational complications 1 (0.29%) and anorexia 11(3.16%) were recorded. Age wise prevalence in young and adult cattle were 115 (33.45%) & 233 (66.96%) respectively. Sex wise prevalence in male and female cattle were 160 (45.98%) and 188 (54.20%) respectively. In goat 115 (24.84% of total animal) 11 different types of digestive disorders such as fever 13 (11.30%), PPR 33 (28.69%), digestive disorders 10 (8.69%), respiratory disorders 8 (6.965), corneal opacity 9 (7.84%), fascioliasis 12 (10.44%), skin disease 11 (9.56%), arthritis 4 (3.48%), subcutaneous cyst 3 (2.61%), urolithiasis 5 (4.34%), and anorexia 7 (6.09%) were recorded. Age wise prevalence in young and adult goat were 36 (31.30%) &79 (68.7%) respectively. Sex wise prevalence in male and female goat were 46 (40%) & 69 (60%) respectively. Diseases and disorders of cattle and goats which were recorded more or less present in both young and adult animals but some of the specific diseases and disorders were in animals due to age susceptibility such as black quarter, coccidiosis in young cattle.

Ahmed *et al.*, (2010) studied a prospective of Brucella seroprevalence was conducted in north-western Libya (western mountains region). Blood samples collected over 13 months in the period December 2006 to January 2008 from 561 animals (goats, sheep, cattle and camels) and 546 human volunteers were tested for Brucella using the Rose Bengal test, tube agglutination test and ELISA assays. Amongst livestock, 31% of goats and 42% of cattle were seropositive. Human samples showed a high seropositivity of

40%, with 95 (43%) of the 221 positive samples positive for IgM, indicating active or recent infection. Control measures are needed to reduce this high prevalence of brucellosis in Libya.

Ahmadi and Meshkehkar (2010) liver fluke infections in herbivores are common in many countries, including Iran. Meat inspection records in an abattoir located in Ahwaz (capital of Khuzestan Province, in southwestern Iran), from March, 20, 1999 to March, 19, 2008 were used to determine the prevalence and long term trend of liver fluke disease in sheep, goats and cattle in the region. A total of 3186755 livestock including 2490742 sheep, 400695 goats and 295318 cattle were slaughtered in the 9-year period and overall 144495 (4.53%) livers were condemned. Fascioliasis and dicrocoeliosis were responsible for 35.01% and 2.28% of total liver condemnations in this period, respectively. Most and least rates of liver condemnations due to fasciolosis in slaughtered animals were seen in cattle and sheep, respectively. The corresponding figures from dicrocoeliosis were goats and sheep, respectively. The overall trend for all livestock in liver fluke was a significant downward during the 9- year period. The prevalence of liver condemnations due to fasciolosis decreased from 7.37%, 1.80%, and 4.41% in 1999–2000 to 4.64%, 1.12%, and 2.80% in 2007–2008 for cattle, sheep and goats, respectively. Dicrocoeliosis was less prevalent than fasciolosis, but similarly declined from 0.35 % and 0.15% in 1999–2000 to 0.00% and 0.08 % in 2007–2008 in cattle and sheep, respectively. Data showed significant seasonal pattern for *Dicrocoelium dendriticum* in sheep and goats, but for Fasciola spp. in different animals there were no statistically significant differences with respect to season. Liver condemnations due to fasciolosis and dicrocoeliosis were more prevalent in cattle slaughtered during summer, whereas they were higher in winter for both sheep and goats. The odds ratio showed a slightly different pattern in some years; however, the overall declining trend was still observed. This survey provides baseline data for the future monitoring of these potentially important parasitic infections in the region, and demonstrating possible long term trends.

Subhasish *et al.*, (2010) studied was conducted regarding the level of burden of gastrointestinal Parasites in goat slaughtered for human consumption in Shillong, Meghalaya during June, 2001 to June, 2006. A total of 250 gastrointestinal tract were examined for adult parasites. The intensity of parasitic infection was recorded maximum in rainy season and least during winter. The parasite recorded was O. venulosum, O.

columbianum, Haemonchus contortus, Bunostomum trigonocephalu, Trichuris species, Trichostrongylus colubriformis, Moniezia expansa, Moniezia benedeni, Gaigeria pachysalis, and Amphistom species. One of the interesting finding was the prevalence of Haemonchus contortus in reticulum in 76.8% cases.

Irshad *et al.*, (2010) studied carried out to determine the prevalence of tick infestation and theileriosis in small ruminants maintained at National Agricultural Research Centre (NARC) Islamabad and Barani Livestock Production Research Institute (BLPRI) Kherimurat district Attock, Pakistan. A total of 662 animals (219 sheep and 443 goats) were screened for the presence of ticks. Of these, 95(43.37%) sheep and 184(41.53%) goats were found infested with different species of ticks. The difference in prevalence of ticks between two farms in sheep and goats (combined) was statistically significant ($P \leq 0.01$). Difference in the prevalence during different months of study at NARC was non significant ($\chi 2=0.95596$), whereas at BLPRI this difference was significant ($P \leq 0.01$). Ticks were identified on the basis of their morphological features. *Rhipicephalus* spp was found to be the most abundant tick infesting both in sheep and goats. Prevalence of theileriosis in sheep was 7.36% (7/95), while in goats it was 3.8% (7/184), the difference being statistically non significant ($\chi 2=0.6427$).

Yacob *et al.*, (2008) conducted during the period between November 2006 to May 2007 to identify ectoparasites and to determine their prevalence in small ruminants in and around Wolaita Soddo (Southern Ethiopia). A total of 214 sheep and 102 goats of both sexes (169 females and 147 males) divided in young and adult animals (72 and 244 respectively) were examined for the presence of ectoparasites or skin lesions. The overall ectoparasite prevalence was 55.7% (147 infested sheep and 29 infested goats) and sheep were significantly more often infected than goats. Within the sheep population, the ectoparasite frequency was significantly higher in females than in males. The main ectoparasites identified in this geographic area were ticks (Rhipicephalus, Boophilus and Amblyomma) and fleas (*Ctenocephales felis* and *canis* at a lesser extend). The tick infestation was significantly more frequently observed in sheep (31.78%) than in goats (18.63%) and was unaffected by the sex or the age. By contrast, the flea prevalence was similar in the 2 ruminant populations, the females (particularly in goats) or the young animals (particular in sheep) being significantly less resistant to the flea infestation. Only one case of mange (*Demodex caprae*) was diagnosed in a goat and pediculosis (*Damalinia ovis*) was only observed in sheep with a relative high frequency (25.70%).

Although these results emphasize the relative higher resistance of goats compared to sheep towards ectoparasites and the low tick prevalence in Southern Ethiopia whereas the pediculosis infection rate would considerably vary according to the climatic conditions during the experimental period, this study demonstrates that ectoparasites greatly affect ruminant health and require an urgent control intervention.

Singh and Prasad (2008) carried out a simple mathematical model has been formulated to assess the losses due to a disease in goats in India. The losses due to important diseases in goats have been computed for a 15-year period (1991- 2005) based on published reports. The rank analysis has revealed that number of incidence was maximum for PPR, followed by FMD and sheep and goat pox. These three diseases have accounted for 54 per cent of the total incidences. The maximum deaths on per year average basis for the period 1991-2005 have been due to PPR, followed by sheep and goat pox, enterotoxaemia and CCP. These fmy diseases have accounted for about 74 per cent of deaths. The overall order with respect to the number of incidences has been found as: PPR > FMD > sheep and goat pox > CCP > fascioliasis / distomatosis > enterotoxaemia > anthrax. The corresponding ranking order with respect to number of deaths was: PPR > sheep and goat pox > enterotoxaemia > CCP > anthrax > fascioliasis / distomatosis > FMD. The total annual average loss due to all diseases in goats has been found of Rs 264.8 lakh. The PPR disease has accounted for the maximum (34.5%) loss, followed by FMD (14.3%), sheep and goat pox (14.1%), CCP (6.4%), enterotoxaemia (6.1%), facioliasis / distomatosis (5.0%) and anthrax (2.0%). Thus, PPR, foot and mouth disease and sheep and goat pox diseases harm goat population on a largescale. Therefore, necessary preventive measures are required to control these diseases of goats.

Gadahi *et al.*, (2008) investigated from August 2004 to May 2008, a total of 400 submitted faecal samples comprising of 90 samples from sheep and 310 from goats of Rawalpindi and Islamabad were analyzed to confirm the presence of gastrointestinal parasitic infection. 254 (63.50%) samples were found positive for endoparasites. Among the samples from sheep 48 (53.33%) and 206 (66.45%) from goats were detected positive for gastrointestinal parasites. Trichuris, Haemonchus, Coccidia, Nematodirus and Fasciola were found with prevalence of 40.00, 28.88, 27.77, 11.11 and 4.44 per cent respectively in sheep. In case of goat the incidence of Haemonchus, Coccidia, Trichuris, Nematodirus, Trichostrongylus, strongyloides and Fasciola were 64.19, 43.87, 35.48, 13.00, 4.51, 3.22 and 0.66 % respectively

Ershaduzzaman *et al.*, (2007) carried out the research work was from July 2004 to June 2005 and the place of research work was Bangladesh Livestock Research Institute (BLRI). The objectives of this work were to investigate the diseases and mortality pattern of goats and some factors affecting mortality and survivability rates of Black Bengal goats under intensive and semi-intensive management, in permanent house. Goats were only vaccinated with Peste des Petits Ruminants (PPR), administered with anthelmintics and dipped in 0.5% Malathion or 0.02% Diazinon solution to control endo- and ecto-parasites, respectively. They were allowed to graze 6-7 hours along with supplemental concentrate and green forages whereas *ad libitum* green grasses and concentrate were supplied to the goats managed under intensive management. The diseases were recorded mainly on the basis of clinical symptoms shown by animals and some by laboratory diagnosis; mortality was confirmed by some laboratory tests and clinical findings before death if any. Adult goats (>1 yr of age) died mostly due to suspected enterotoxaemia in the dry season (October to March) when there were shortages of green grasses in the grazing lands, which were confirmed by Gram's staining and ELISA tests, and female goats died significantly more than male. Growing goats (3-12 months of age) mortality was about 22%, died mostly due to diarrhoea and pneumonia and mortality was higher (nearly 40%) in hot and wet season (July to October). The overall kid (0-3 months of age) mortality within study period was about 29%, of which the major causes were infectious (63%) i.e., diarrhoea, pneumonia, ecthyma and enterotoxaemia. Excluding accidental causes (predators and mechanical) mortality was reduced to about 18%.Kid mortality was affected by birth weight which was just opposite to mortality. It was also affected by birth seasons, litter size, sex of kids, dam's body weight at kidding but parity was no significant effect on kid mortality Kids like growing goats, also died significantly more during hot and wet season. Morbidity was higher in female goats where mostly diarrhoea and pneumonia and some sorts affected all age groups of goats by ecthyma. There were seasonal differences.

Uddin *et al.*, (2006) investigated the prevalence of amphistome parasites in Black Bengal goats slaughtered at different slaughterhouses of Mymensingh district, a total of 144 gastro-intestinal tracts were examined during the period of July 1998 to June 1999 in the Department of Parasitology, Bangladesh Agricultural University, Mymensingh. Out of 144 Black Bengal goats, 105 (72.92%) were infected with a single or multiple species of amphistomes. In present investigation, three species of amphistomes viz

Paramphistomum cervi, Cotylophoron cotylophorum and *Gastrothylax crumenifer* were identified. The highest infection was observed with *Paramphistomum cervi* (65.28%) and lowest infection with *Cotylophoron cotylophorum* (36.11%). Mixed infections with two or more species of amphistomes were found in 60.42%. Age had a significant ($p<0.01$) influence on the prevalence of amphistomes in goat. A higher prevalence (89.58%) was observed in older animals followed by young animals (78.57%), whereas a lower prevalence (45.0%) in growing animals. However, the prevalence increased with the increase of age. The females (75.0%) were found more (1.44 times) susceptible to amphistomes infection than the males (67.5%). The prevalence of amphistomes was very high all the year round and the rate of infection was 83.64%, 69.23% and 64.0% during monsoon, winter and summer season respectively. The present study concluded that Black Bengal goats are susceptible to amphistome infection irrespective of age, sex and season of the year. So, control of these parasites is essential and the further investigation is needed, focusing on control procedures of amphistomes infection in goats.

Omoike (2006) collected the clinical records of small ruminant (Sheep and Goat) diseases treated the veterinary clinics, Ministry of Agriculture and Natural Resources of three Local Government areas in Edo state, for a period of five years (1997-2002). To identify the disease occurrence and prevalence as it militates against the growth of these animals in these sub- humid areas. The total numbers of small ruminants treated were 316 having 25 cases of Sheep and 291cases of goats. Diarrhoea accounted for 20 & 12.4%; helminthiasis 20 & 13.4% and Pneumonia 16 & 20.3% for sheep and goat respectively. Pneumo-enteritis, mange, anorexia, wound and kata were common among goat while, pneumo-enteritis; helminthiasis and wound were among sheep. Goat diseases prevalence showed much occurrence of pneumonia, helminthiasis and diarrhoea. The statistical analysis of the clinical treatment data using a three factor analysis of variance revealed that animal type and disease were significant ($p<0.05$), while, the diseases occurrence due to the local government area was not significant ($P<0.05$). The disease occurrence strictly depended on the type of disease and species of the small ruminant. Profitable and efficient animal development in these local government areas and other areas with similar conditions, call for re-sensitization towards adequate small ruminants' health care management programmes especially semi-intensive method with regular deworming; both governmental and non governmental contribution by funding research on the improvement of indigenous breed.

Shabih and Juyal (2006) paramphistomosis is one of the most pathogenic diseases in domestic ruminants having considerable significance in Africa, Asia, Eastern Europe, Russia and several areas of the other country including Punjab state. It causes heavy economic losses to livestock industry to the tune of several thousand crores of rupees annually. Incidence of amphistomosis in cattle, buffaloes, sheep and goats has been reported in different states of India from time to time. The epidemiological survey of paramphistomosis in ruminants in some district of Punjab and adjoining state was conducted under DST sponsored project on paramphistomosis. A total of 2628 faecal samples (651 cattle, 1608 buffaloes, 213 sheep and 156 goats) were collected randomly from different village(s)/area(s) of the district of Punjab and adjoining areas in Jammu (J&K) during the period July 2004 to June 2005. The samples were screened microscopically for paramphistome eggs by sedimentation methods. Out of the total, 167 faecal samples (122 buffaloes, 22 cattle, 14 sheep and 9 goats) were found positive for paramphistome eggs with an incidence rate of 6.35 percent. The highest incidence was found in buffaloes followed by sheep, goats and cattle. District-wise incidence rate was observed to be highest in Gurdaspur followed by Amritsar, Kapurthala and Jammu. After pooling all the data seasonal epidemiological observation of paramphistomosis revealed highest incidence rate of buffaloes in monsoon, followed by goats in monsoon and summer, sheep in winter, and cattle in postmonsoon. The lowest incidence rate of cattle was observed in winter, buffaloes in postmonsoon and summer where as sheep during monsoon. Overall, seasonal epidemiology of paramphistomosis revealed highest incidence during monsoon followed by summer, post-monsoon and winter. During monson months, goats and buffaloes showed highest incidence as compared to cattle and sheep. The transmission is through the ingestion of grass with encysted metacercariae which is abundant during monsoon and postmonsoon season, the snails specially *Indoplanorbis exustus* and *Gyraulus convexiou* sculus were established as main source of infection in endemic areas. There is a need to develop suitable management strategies for the diagnosis of paramphistomosis.

Kato (2000) conducted a cross-sectional study in 1998 on goat health and management was conducted in eastern and western Uganda. This study involved 1518 goats which were distributed in 145 herds in 5 districts, namely Kumi, Masaka, Mbarara, Soroti and Ssembabule. Cluster sampling was used to select farms across the two regions. A questionnaire on goat health, management and constraints to production was

administered to 145 goat owners. Blood and nasal swabs were collected from a random sample of goats. For each goat a physical examination was performed to detect presence of clinical conditions. Serological assays for contagious caprine pleuropneumonia (CCPP), peste des petits ruminants (PPR) and brucellosis were performed. Bacterial cultures were done to isolate the genera of bacteriain goats with clinical respiratory conditions (CRC). Another aspect of this study involved collection of gastro-intestinal tracts from the abattoir to determine the prevalent nematode worm types and corresponding burdens as assessed through worm and fecal egg counts. *Brucella melitensis* was detected in 9.8% (141/1446) of the goats and these were distributed in 43.4% of the farms. Abortions were reported in 52% of the herds. Asimulation model for transmission dynamics and control options for brucellosis in goats was developed and is described. Considering individual goats, CCPP, PPR, mange, hoof conditions, abscesses, CRC, and infestation with ticks were detected in 29.7% (246/827), 0.5% (8/1466), 0.7% (10/1506), 3.2% (47/1475), 15.7% (237/1509), 2.2% (33/1508), 17.5% (262/1493) and 28.7% (1423/1509) of the goats, respectively. The corresponding distributions of CCPP, PPR, mange, hoof conditions, and CRC at herd level were 55.1% (38/69), 2.1% (3/142), 4.1% (6/145), 10.3% (15/145), 51% (74/145) and 29.7% (43/145), respectively. Putative risk factors for diseases detected were identified through multivariable logistic regression models. These results have revealed a need for active disease surveillance in goats in Uganda and a need for educating farmers on biosecurity and modem goat management practices. This study was done in only two regions of the country and is prone to biases associated with cross-sectional designs, thus more studies, preferably longitudinal, are needed to further investigate diseases and production constraints of farmers along with possible intervention measures.

Ndegwa *et al.*, (2000) performed california mastitis test (CMT), direct leukocytes counts and bacteriological examination were performed on 630 milk samples from apparently healthy mammary glands of dairy goats comprising a mixed population of German Alpine, Toggenberg, Saanen and Galla crosses to find the prevalence of subclinical mastitis. The prevalence of subclinical mastitis was 9.8 % according to CMT, 9.7 % according to direct leukocyte counts and 28.7 % by bacterial isolation during a 3-month period. The proportion of the bacteriologically positive milk samples was significantly (P <0.01) higher than that positive for CMT and direct leukocyte counts. There was a significant (P < 0.01) correlation between CMT and direct leukocyte counts. There was

no significant direct relationship between bacterial isolation and CMT. Bacterial organisms were isolated in 22.5 % of the 568 CMT-negative milk samples. The results suggest that bacterial organisms isolated from the CMT-negative milk samples were either latent infections or did not stimulate any significant increase in somatic cell counts that could be detected by either the CMT or direct leukocyte counts. The observations of this study indicate that the mere presence of bacteria in goat's milk does not mean that the udder is infected and so does not warrant antibiotic therapy.

Moshi *et al.*, (1998) evaluated the prevalence and significance of the mastitis problem in dairy goats where have been introduced in Tanzania. A total of103 goats with 206 quarters from Magadu, Mgeta' and Tengeru were screened for mastitis using the California mastitis test (CMT) reagent. A total of 177 quarter milk samples were available for bacteriological examination; Somatic cell count (SCC) was performed on 94 samples. Statistical analyses were carried out on the logarithm of SCC for the effects of location, parity, stage of lactation, exotic blood level and CMT score. The overall prevalence of subclinical mastitis on animal and quarter basis was 80.5 % and 72.8%, respectively. Infectious organisms were isolated in35.5% of the cultured samples. Organisms isolated included *Staphylococcus* spp (49.2%), *Streptococcus* spp (14.2%), *Bacillus* spp (4.8%), *Escherichia coli* (26.9%), *Candida albicans* (3.2%) and *Klebsiella* spp 0.6%). The overall agreement between the CMT and bacteriological examination was 34.6%. Somatic cell count increased with increasing CMT score. SCC for CMT score negative was 1.06 x 106 while for the CMT score of trace and above the SCC was above 2.0 x 106. It is concluded that subclinical mastitis in dairy goats is a serious problem.in the surveyed areas.

CHAPTER III

MATERIALS AND METHODS

3.1 Study area

On the basis of animal population Bagherpara upazila in Jessore District was selected for this study. Location of research site was shown in figure 1.

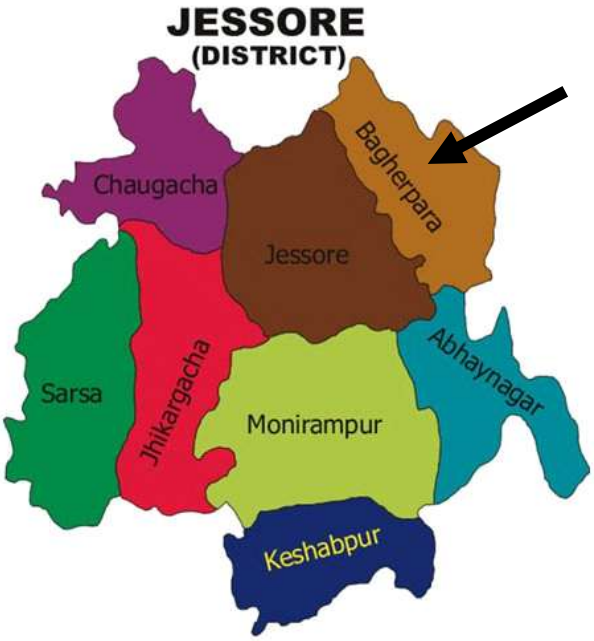

Fig. 1: Study area at Bagherpara upazilla in Jessore district is shown by arrow

3.2 Study period and animals

The study area was conducted over a period of one year from January 2017 to December 2017. A total of 2650 (2200 cattle and 450 goat clinical cases of goats were studied for diagnosis of diseases. During the study period all the data of each animal were collected and recorded. The study period was divided into three seasons namely summer (July to October), rainy (March to June) and winter (November to February). The proportional prevalence of diseases and disorders were calculated in percentage of the total records.

3.3 Procedure of disease diagnosis

The clinical cases were recorded during the physical visit of the animals against owner's complain. The clinical diagnoses of the diseases were made based on history, presenting clinical signs, physical examination, laboratory diagnosis and response to treatment.

3.3.1 General examination

Animal behaviour, posture, gait, superficial skin, elevation, nasal discharge, defecation and urination disturbance were observed by visual examination of the patients.

Fig. 2: General examination of the animals

3.3.2 Physical examination

Examinations of different external parts of the body of each animal were done during field visit by using various close observation techniques.

3.3.3 Clinical examinations

The animals were examined during field visit and temperature, pulse, respiration rate from each of animal were recorded. The presented clinical manifestation of various diseases of goat were recorded and the farmers complain was recorded.

3.3.4 Clinical sign

All clinical signs of cattle and goat diseases under study were studied according to the causal agent described in below:

3.3.5 Bacterial diseases and viral diseases

3.3.5.1 Black quarter

Black Quarter (BQ) is caused by *Clostridium chauvoei*. It is a gram positive, spore forming, rod shaped bacteria. It is a toxin producing anaerobic bacterium. Stiff gait, disinclined to move, severe lameness either unilateral or bilateral. Painful walking, discoloration of skin with no necrosis and gangrene. Extensive local lesion in vulva and vagina occurs through skin wounds. Head swelling leads to haemoptysis, high fever, anorexia, depression and quick death. Short course of the disease, dyspnoea and recumbence in 3 to 4 days occurs.

3.3.5.2 Mastitis

Mastitis is an inflammation of the mammary gland (udder) that causes a chemical and physical reaction in milk produced by cattle and goats. The acute systemic form of mastitis comes on suddenly with an elevated fever above 105° F and an accelerated pulse. A doe may move slowly, experience depression, and lose its appetite. Typically, the mammary gland is hard, swollen, and reddish in color. It may also be hot and sensitive to touch. Milk secretions are watery and yellowish in color. The milk may also flake and clot. In most severe cases, mastitis can be fatal. The acute form, however, can be easily diagnosed by the signs and presence of white blood cells in the milk. The chronic form of mastitis occurs as a persistent and incurable infection. The udder may

have hard lumps as a result of bacteria forming colonies and reactions occurring in the mammary tissues. In chronically affected calves, agalactia, which is the lack of milk, may occur. The subclinical mastitis causes the most concern among producers and veterinarians because there are no visible signs of the disease. There is no swelling of the udder or detectable abnormalities in the milk to indicate the presence of mastitis. The sub-clinical form can eventually develop into the chronic clinical form of mastitis.

3.3.5.3 Haemorrhagic septicemia

The disease is caused by certain serotypes of Pasteurella multocida, a Gram-negative cocco *Bacillus* residing mostly as a commensal in the nasopharynx of animals. Widespread haemorrhages, oedema, and hyperaemia, consistent with severe sepsis. Oedema consists of a coagulated serofibrinous mass with straw-coloured or bloodstained fluid. Swelling of the head, neck, and brisket occurs in nearly all cases. Similar swellings can also be found in the musculature. Subserosal petechial haemorrhages may occur throughout the body, and the thoracic and abdominal cavities often contain blood-tinged fluid. Scattered petechiae may be visible in the tissues and lymph nodes, particularly the pharyngeal and cervical nodes; these nodes are often swollen and hemorrhagic. Pneumonia or gastroenteritis occasionally occurs, but usually is not extensive.

3.3.5.4 Tetanus

Infection of wounds by bacterium *Clostridium tetani* results in tetanus when the bacterium produces its potent toxin. Wounds can include those caused by humans when live tissues are injured and blood drawn during hoof trimming. The organism is sensitive to oxygen, so deep puncture wound are of the most concern. Signs of illness can include muscle stiffness, unsteady gait, drooping eyelids, changed voice, erect ears and tail and inability to eat or drink. The signs often get progressively worse and convulsions may occur. Death occurs from asphyxiation secondary to respiratory paralysis.

3.3.5.5 Foot and mouth disease

Foot-and-mouth disease or hoof-and-mouth disease (*Aphthae epizooticae*) is an infectious and sometimes fatal viral disease that affects cloven-hoofed animals, including domestic and wild bovids. The virus causes a high fever for approximately two to six days, followed by blisters inside the mouth and on the feet that may rupture and cause lameness. The incubation period for foot-and-mouth disease virus has a range between

one and 12 days. The disease is characterized by high fever that declines rapidly after two or three days, blisters inside the mouth that lead to excessive secretion of stringy or foamy saliva and to drooling, and blisters on the feet that may rupture and cause lameness. Adult animals may suffer weight loss from which they do not recover for several months, as well as swelling in the testicles of mature males, and in cows, milk production can decline significantly. Though most animals eventually recover from FMD, the disease can lead to myocarditis (inflammation of the heart muscle) and death, especially in newborn animals. Some infected ruminants remain asymptomatic carriers, but they nonetheless carry FMDV and may be able to transmit it to others.

3.3.5.6 Rabies

Rabies is a fatal viral disease of the nervous system caused by a rhabdovirus which can affect all mammals including humans. The virus is usually spread through contact with saliva via the bite of an infected animal, but can be transmitted through an open wound or a mucous membrane such as those in the mouth, nasal cavity or eyes. Early clinical signs of rabies include behavimy changes - friendly animals may become cautious, shy animals may become bold, hypersensitivity to noise or light, increased aggression - dogs may try to break free and attack objects, animals and handlers, eyes taking on a staring expression, drooping lower jar and more saliva than normal produced - appears like something is stuck in the throat, itching, thirst. The final stages of rabies includes weak muscles, especially legs and tail, difficulty swallowing, drooping eyelids, saliva frothing at the mouth, general paralysis followed by convulsions and coma before death.

3.3.5.7 Actinobacillosis

Actinobacillus ligniersi (normal commensal organism in the oral flora of the cattle), Gram negative coccobacilli or pleomorphic rods, grow on blood and serum containing media at 20-43^{o}C and need increase in Co_2, sticky colonies, non-hemolytic on blood agar.The onset of glossal actinobacillosis is usually acute, the affected animal being unable to eat for a period of about 48 hours. There is excessive salivation and gentle chewing of the tongue. On palpation the tongue is swollen and hard, particularly at the base, the tip often appearing to be normal. Nodules and ulcers are present on the side of the tongue and there may be an ulcer at the anterior edge of the dorsum. In the later stages when the acute inflammation is replaced by fibrous tissue, the tongue becomes shrunken and immobile and there is considerable interference with prehension.

3.3.5.8 Foot rot

Foot rot is a contagious disease of the hooves of goats and sheep that occur most often during persistent periods of rainy weather along with temperatures above 50°F.The first symptoms of foot rot are limping, holding legs above the ground, reluctance to walk, and grazing on knees. The sole and the sidewall of the diseased foot appear ragged and rotten and have an extremely bad necrotic odor.

3.3.5.9 Contagious ecthyma

Contagious ecthyma is a highly contagious, zoonotic, viral skin disease that affects cattle, goats and some other domesticated and wild animals. The skin lesions are painful and often occur on the mouth and muzzle, where they can cause anorexia or starvation. Lesions on the udder may result in the abandonment of offspring, and foot lesions can cause transient lameness. Secondary bacterial infections can occur and, in rare cases, the lesions may extend into the internal organs.

3.3.5.10 Pneumonia

Pneumonia manifests in numerous ways in dairy cattle, depending on the age of the animal, and stage of the disease, among other factors. Early clinical signs: Fever, Depression, In appetence, Serous nasal and eye discharge, Purulent nasal discharge, Bloody nasal discharge, Stiff gait, Crusty muzzle, Salivation, Mild diarrhea Rapid, shallow breathing, Soft coughing.

3.3.5.11 Warts

Warts (infectious papillomatosis) are caused by papilloma viruses. In cattle at least 6 distinct strains of papilloma viruses have been recognized, each producing characteristic lesions. The virus is transmitted by direct contact, contaminated objects (e.g. equipment), and possibly by insects, with the virus gaining entry through skin abrasions or wounds. The incubation period—that is, the time a wart takes to develop after infection—is normally around 8 weeks but can be longer. Warts may last for up to twelve months or more before spontaneously regressing. In cattle, warts commonly occur on the head, neck and shoulders, but can be found anywhere on the body. The extent and duration of the lesions depend on the type of virus, area affected, and degree of susceptibility, with young cattle under 2 years of age being most susceptible. Papillomatosis becomes a herd

problem when the infection occurs in a large group of young, susceptible cattle. Immunity usually develops 3–4 weeks after initial infection, which persists for at least 2 years. Warts are usually small with a cauliflower-like appearance and cause little trouble. Occasionally, warts may infect large areas of the body and cause ill-thrift if they interfere with normal function or become infected or flyblown through trauma. Some types of warts may involve the venereal regions where they can cause pain, disfigurement, infection of the penis of young bulls, and dystocia when the vaginal mucosa of heifers is affected.

3.3.6 Gyneco-obstetrical cases

3.3.6.1 Retained placenta

Some signs and symptoms include: Postpartum hemorrhage after the placenta has been birthed, Foul smelling vaginal discharge, Fever, Painful cramping and contracting, Examination of the placenta shows possible tears or missing pieces, Delay in milk production.

3.3.6.2 Repeat breeding

A repeat breeder is a cow that is cycling normally, with no clinical abnormalities, but has failed to conceive after at least two successive inseminations. An **early repeater** is an animal whose luteal function has been shorter than normal or typical for the physiological oestrus cycle in non bred cow. In these cows the most probable event is either failure of fertilization (delayed ovulation, poor semen quality etc.) or early embryonic death (delayed ovulation, poor embryo quality, unfavourable uterine environment, precocious luteolysis). The cows will come into heat within 17-24 days after AI. A **late repeater** is a cow that comes into heat later than 25 days after AI. In these animals the luteal function was maintained for longer than the physiological luteal phase in non bred cows. Fertilization and initial recognition of pregnancy probably took place but for some reason (inadequate luteal function, inadequate embryo signaling, infectious diseases, induced luteolysis) luteolysis was induced and pregnancy lost.

3.3.6.3 Abortion

An abortion is a pregnancy that ends before the baby can survive outside the womb because it has not yet reached viability. An abortion may be early - during the first 14

weeks of pregnancy, or late. The vast majority are early - only about 1% of abortions are late. The first abortion symptom is vaginal bleeding, which can range from spotting to being heavier than a period. A little spotting may be an early sign of abortion although fortunately this may amount to no more than a threatened abortion and the pregnancy continues. The second abortion symptom is pelvic pain. The third abortion symptom is cessation of pregnancy symptoms including breast tenderness, morning sickness and having to pass urine more frequently than usual. Some women have no abortion symptom and the discovery is made at ultrasound examination. A threatened abortion occurs when there is vaginal bleeding but ultrasound confirms a viable pregnancy.

3.3.6.4 Dystocia

Specific signs of dystocia are: prolonged, non-progressive, first stage labor; the cow standing in an abnormal posture during fetal death .First stage labor-in case of uterine torsion the cow may stand with a dipped back in the saw horse posture and failure of the calf to be delivered within 2 hours of the amnion appearing at the vulva. Obvious made, the history of the case as well as certain other malpresentation, malposture, or maldispositions-for example the appurtenance of the fetal head but no forelimbs, the tail but no hind limbs, the head and a single forelimb, the appurtenance of detached chorioallantois, fetal meconium or blood stained amniotic fluid appears at the vulva . The usual clinical signs are the onset of labor without delivery of fetus and/or fetal membranes and later regression of parturition signs. The cow may show signs of mild discomfort. The animal may adopt a rocking horse stance and show mild colic pain. Partial anorexia, dullness and depression may be evident. One or both lips of the vulva are pulled in because of torsion of the birth canal. When the cervix is fully dilated it is not palpable as a separate structure and is continuous with the vagina. Incompletely dilated cervix is palpable through per rectum examination.

3.3.6.5 Pyometra

Pyometra is defined as an accumulation of pus in the uterus and is associated with infertility and postpartum anoestrus. In cows, it is usually associated with a persistent corpus luteum. In cattle, causes may be attributed to retained afterbirth following calving, secondary infections with *Campylobacter spp*, *Staphylococcus spp* and *Streptococcus spp* bacteria, as well as protozoa including *Tritrichomonas spp, Brucella spp*. Clinical signs may be missed in cattle as systemic illness is not as common with

other animals. Decreased milk yield, dullness or other signs of toxemia, including fever, a purulent vaginal discharge and laboratory tests showing a leucocytosis may help establish a diagnosis.

3.3.6.6 Anestrus

It is defined as absence of periodic manifestation of estrus, with the absence of palpable follicular or luteal structures (smooth ovaries) or absence of normal physiological signs of estrus associated with a corpus luteum (subestrus, physiological anestrus). Inactive or non-functional ovary is one of the most important causes of anestrus in cattle. Anestrus is one of the most commonly occurring reproductive disorders in cattle.

3.3.6.7 Vaginal prolapse

Factors that predispose to vaginal prolapse include over-conditioned obese cows, increased intra-abdominal pressure from increased size of the pregnant uterus, intra-abdominal fat or distention of fore-stomach superimposed with relaxed muscles and softening of soft tissues around the birth canal as a result of increased hormone (relaxin and estrogen) production during late pregnancy in preparation for calving. Grazing on pastures containing plants that produce high amounts of phytoestrogens (*Trifolium subterraneum)* and heifers implanted with growth implants containing estrogens increases the risk of getting a vaginal prolapse. Donor cows in embryo transfer programs are at risk to develop vaginal prolapse as a result of effect of the increased amounts of estrogen released during multiple follicle development. Stabled cows are more prone to develop vaginal and cervical prolapse than cows that are out on pasture.

3.3.6.8 Uterine prolapse

Uterine prolapse occurs immediately or within a few hours after calving. The uterus (calf-bed) is completely expelled out at the back of the cow and will hang along the back of hind legs when the cow is standing. Uterine prolapse is a life threatening condition for the cow, and the uterus must be replaced back to its normal position within the abdomen as quickly as possible. A cow with uterine prolapse can go into shock quickly and die from blood loss. Avoid chasing or moving a cow with uterine prolapse and consult ymy veterinarian for further instructions based on the location of the cow on the farm.

3.3.7 Metabolic and nutritional causes

3.3.7.1 Grass tetany

Progressive symptoms may include grazing away from the herd, irritability, muscle twitching, staring, incoordination, staggering, collapse, thrashing, head thrown back, and coma, followed by death. However, clinical signs are not always evident before the animal is found dead.

3.3.7.2 Downer's cow syndrome

Cow is inability to rise and remains in recumbent position. On stimulation the cow either makes little attempt or no attempt to rise or simply unable to rise even with treatment for milk fever. Cow remains bright and alert. Appetite, rumination, defecation and urination are usually normal. Temperature is usually normal but may turn towards sub-normal range in the terminal stage disease. The affected cow usually crawls around utilizing the forelimbs whereas hind limbs remain in flexed position. This type of stance is ascribed as "creeper cow". A downer cow which continues to remain down for more than 7 days ends fatally.

3.3.7.3 Acidosis

Some of the common symptoms of metabolic acidosis include the following: rapid and shallow breathing confusion**,** fatigue**,** headache**,** sleepiness**,** lack of appetite**,** jaundice**,** increased heart rate, breath that smells fruity, which is a sign of diabetic acidosis (ketoacidosis).

3.3.7.4 Ketosis

Symptoms include breath that smells fruity or like nail polish or nail polish remover, rapid breathing or shortness of breath, excessive thirst, frequent urination, stomach pain, nausea, vomiting, fatigue, weakness, confusion.

3.3.7.5 Milk fever

In typical cases cows show some initial excitement or agitation and a tremor in muscles of the head and limbs. Then they stagger and go down to a "sitting" position, often with a 'kink' in her neck, and finally lie flat on their side before circulatory collapse, coma and death. A dry muzzle, staring eyes, cold legs and ears, constipation and drowsiness are

seen after going down. The heart beat becomes weaker and faster. The body temperature falls below normal, especially in cold, wet, windy weather. These signs are due mainly to lowered blood calcium levels. Sometimes there are additional signs due to complicating factors. Bloat is common in cows unable to "sit up" because the gas in the rumen is unable to escape. Pneumonia and exposure may affect cows left out in bad weather.

3.3.8 Parasitic diseases

3.3.8.1 Fasioliasis

Fascioliasis can be symptomatic or asymptomatic. Symptomatic cases begin approximately 2 months following ingestion of metacercariae. During the acute phase (caused by the migration of the immature fluke through the hepatic parenchyma), manifestations include abdominal pain, hepatomegaly, fever, vomiting, diarrhoea, urticaria and eosinophilia and can last for months. In the chronic phase (caused by the adult fluke within the bile ducts), the symptoms are more discrete and reflect intermittent biliary obstruction and inflammation. Occasionally, flukes have been seen in ectopic locations of infection, including the intestinal wall, lungs, subcutaneous tissue and pharyngeal mucosa. Aberrant migration by immature *Fasciola* through the skin in human fascioliasis has been reported in Vietnam.

3.3.8.2 Tick infestation

Tick infestations are associated with decreased productivity, loss of blood and blood proteins, transmission of diseases, debilitation, and even death. Feeding sites on the host vary with the tick species. Ticks are associated with an acute paralytic syndrome called Tick Paralysis. This disease is characterized by ascending paralysis and may lead to death if the tick is not removed before the paralysis reaches the respiratory muscles. Diagnosis is based on identification of the species.

3.3.8.3 Mite infestation

The surface mite is usually found on the neck, legs, and tail head. It produces limited hair loss, which only increases slowly in size. However, the lesions are obviously itchy which results in hide damage elsewhere as the cattle try to rub the affected areas. The burrowing mite prefers the neck and the loin area next to the tail (leading to the description of ‘neck and tail’ mange). As they burrow into and out of the skin they

produce a much more intense irritant reaction so that the skin damage rapidly develops with much larger areas being affected and the skin becoming very thickened and crusty. Infection of the damaged areas often develops and affected animals have much reduced production.

3.3.8.4 Hump sore

Ulceration, hyperkeratosis & alopecia and lesion rich in blood & Lesions become hard. Lymph & Itching lead to rubbing which may cause severe wounds covered with thick dry crust.

3.3.8.5 Bottle jaw

Lumpy jaw develops slowly, over a few weeks or months, and so may not be recognized in the early stages. The first sign is often an enlargement of part of the jawbone. The swelling would be hard, immoveable, maybe painful to touch, and would be slowly becoming larger. Later it may be discharging a clear, sticky, honey like material containing small granular particles. Because swallowing and eating are painful for affected animals, they gradually lose condition. There may be an associated swelling of the soft tissues under the jaw, commonly called "bottle jaw".

3.3.8.6 Maggot

Painful, slow developing ulcers or furuncle like sores that can last for a prolonged period.

3.3.9 Digestive problems

3.3.9.1 Bloat

In primary pasture bloat, the rumen becomes obviously distended suddenly, and the left flank may be so distended that the contmy of the paralumbar fossa protrudes above the vertebral column; the entire abdomen is enlarged. As the bloat progresses, the skin over the left flank becomes progressively more taut and, in severe cases, cannot be “tented.” Dyspnea and grunting are marked and are accompanied by mouth breathing, protrusion of the tongue, extension of the head, and frequent urination. Rumen motility does not decrease until bloat is severe. If the tympany continues to worsen, the animal will collapse and die. Death may occur within 1 hr after grazing began but is more common

~3–4 hr after onset of clinical signs. In secondary bloat, the excess gas is usually free on top of the solid and fluid ruminal contents, although frothy bloat may be seen in vagal indigestion when there is increased ruminal activity. Secondary bloat is seen sporadically. There is tympanic resonance over the dorsal abdomen left of the midline. Free gas produces a higher pitched ping on percussion than frothy bloat. The distention of the rumen can be detected on rectal examination. In free-gas bloat, the passage of a stomach tube or trocarization releases large quantities of gas and alleviates distention.

3.3.9.2 Diarrhoea

Signs and symptoms associated with diarrhea may include: Frequent loose, watery stools, Abdominal cramps, Abdominal pain, Fever, Bleeding, Lightheadedness or dizziness from dehydration .Diarrhea caused by a viral infection, such as a stomach virus, or bacterial infection also may cause vomiting. In addition, blood and mucus in the stools may appear with diarrhea caused by bacterial infections.

3.3.9.3 Dehydration

Sunken eyes, skin remains tented, dry nose, weakness, pale, dry gums, and a capillary refill time longer than 2 seconds are some of the more common signs of dehydration.

3.3.9.4 Anorexia

Loss of appetite, decreased food consumption, Slow or week ruminal movements, rumen may be doughy, Diminished milk yield, Loss of weight, Weakness and dehydration.

3.4 Prevalence

Prevalence were calculated as number of cases of disease divided by population at risk and multiply by 100.

$$\text{Prevalence rate (\%)} = \frac{\text{No. of cases of disease}}{\text{Population at risk}} \times 100$$

3.5 Grouping of animals for treatment purpose

A total of 15 animals (goat) were taken for treatment purposes against Peste des Petits Ruminants (PPR) and the animals were grouped as

Group-A: Contain 5 animals and treated with Gentasone plus (Gentamicin 30 mg + Sulphadimidine 125 mg + Trimethoprim 25 mg) @ 1ml per 10 kg body weight IM injection.

Group-B: Contain 5 animals and treated with Gentacin 5% (Gentamicin 50 mg) @ 1 ml per 10 kg body weight IM injection.

Group-C: Contain 5 animals and treated with Gentacin 10% (Gentamicin 100 mg) @ 1 ml per 10 kg body weight IM injection.

3.6 Statistical analyses

The collected data was analyzed by a statistical software namely, SPSS version 20. Associations between explanatory variables season and sex were done by chi-square test. In all analysis, the significance was observed through statistical data and $p<0.05$ were set to indicate significance.

CHAPTER IV

RESULTS

The study was conducted on prevalence of diseases and disorders in cattle and goats at Bagherpara upazilla in Jessore district for a period of one year from January, 2017 to December 2017. In this study a total of 2650 clinical cases were recorded.

4.1 Prevalence of diseases and disorders in cattle

The prevalence of diseases and disorders in cattle were shown in table 1. The highest prevalence were parasitic diseases (28.64%) followed by Bacterial and Viral diseases (27.04%), Digestive diseases (19.64%), Gyneco-obstetrical cases (16.27%) and lowest Metabolic and Nutritional diseases (8.41%).

Table 1: Prevalence of diseases and disorders in cattle at Bagherpara Upazila in Jessore District

Diseases (cattle)		Affected (n)	%
Gyneco-obstetrical	Retained placenta	18	5.03
	Repeat breeding	68	18.09
	Teat fistula	6	1.68
	Abortion	26	7.26
	Dystocia	85	23.74
	Pyometra	24	6.70
	Anestrus	90	25.13
	Uterine prolapse	30	8.38
	Vaginal prolapse	11	3.07
Sub total		**358**	**16.27**
Metabolic and nutritional	Grass tetany	30	16.21
	Downer's cow syndrome	25	13.51
	Acidosis	70	37.84.
	Ketosis	20	10.81
	Milk fever	40	21.62
Sub total		**185**	**8.41**
Bacterial and viral	Foot and mouth disease	200	33.61
	Rabies	100	16.81
	Haemorrhagic Septicemia	10	1.68
	Actinobacillosis	8	1.34
	Foot Rot	15	2.52
	Contagious Ecthyma	20	3.36
	Black Quarter	40	6.72
	Tetanus	15	2.52
	Pneumonia	55	9.24
	Mastitis	105	17.64
	Warts	27	4.53
Sub total		**595**	**27.04**
Parasitic	Fasioliasis	225	35.71
	Tick Infestation	170	26.98
	Hump Sore	30	4.76
	Bottle Jaw	45	7.14
	Maggot	105	16.67
	Mite Infestation	55	8.73
Sub total		**630**	**28.64**
Digestive	Bloat	85	19.68
	Diarrhea	150	34.72
	Dysentery	72	16.67
	Dehydration	60	13.88
	Anorexia	65	15.05
Sub total		**432**	**19.64**
TOTAL		**2200**	**100**

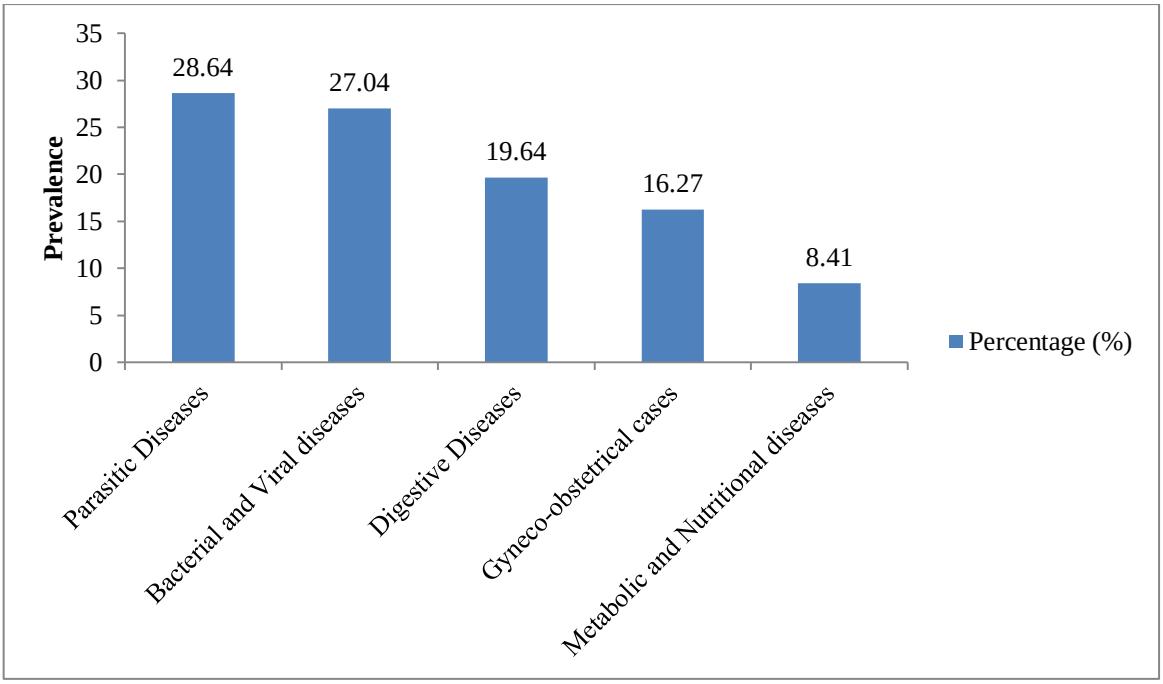

Fig. 3: Prevalence of diseases and disorders in cattle

4.2 Prevalence of diseases and disorders in goat

The prevalence of diseases and disorders in Goat were shown in table 2. The highest prevalence were Bacterial and Viral diseases (32.22%), followed by parasitic diseases (26.67%), Digestive diseases (17.33%), Gyneco-obstetrical cases (12.22%) and lowest Metabolic and Nutritional diseases (11.55%).

Table 2: Prevalence of diseases in goat at Bagherpara Upazila in Jessore District

Diseases (goat)		Affected (n)	%
Gyneco-obstetrical	Retained placenta	5	9.09
	Repeat breeding	5	9.09
	Teat fistula	4	7.27
	Abortion	5	9.09
	Dystocia	8	14.54
	Pyometra	7	12.73
	Anestrus	15	27.27
	Uterine prolapse	6	1.33
Sub total		**55**	**12.22**
Metabolic and nutritional	Acidosis	30	57.70
	Ketosis	22	42.31
Sub total		**52**	**11.55**
Bacterial and viral	Peste Des Petits Ruminants	30	20.69
	Rabies	15	10.34
	Foot Rot	15	10.34
	Contagious Ecthyma	20	13.79
	Tetanus	10	6.96
	Pneumonia	15	10.34
	Mastitis	40	27.58
Sub total		**145**	**32.22**
Parasitic	Fasioliasis	25	20.83
	Tick Infestation	45	37.5
	Maggot	35	29.16
	Mite Infestation	15	12.50
Sub total		**120**	**26.67**
Digestive	Bloat	24	30.77
	Diarrhea	25	32.05
	Dysentery	12	15.38
	Dehydration	3	3.85
	Anorexia	14	17.95
Sub total		**78**	**17.33**
TOTAL		**450**	**99.99**

$P<0.05$ means significant at 5% level of significance

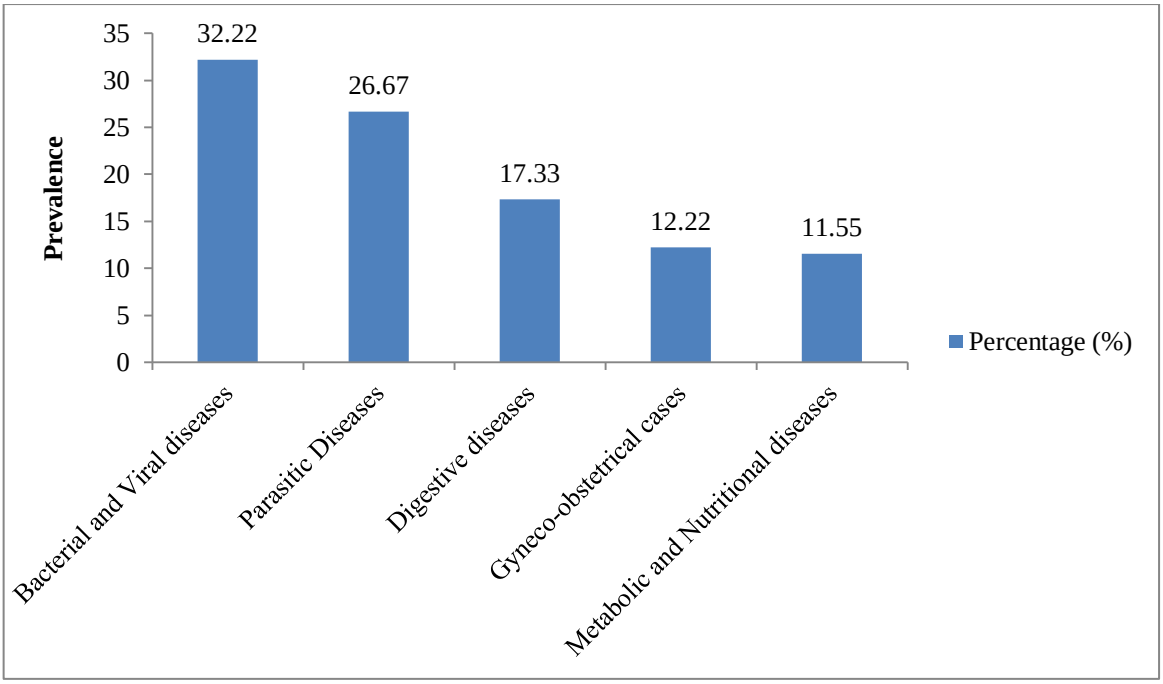

Fig. 4: Prevalence of Diseases and Disorders in Goat

4.3 Season wise prevalence of diseases and disorders in cattle

The prevalence of diseases and disorders in cattle based on season were shown in table 3. The highest prevalence were Digestive diseases (26.92%) followed by parasitic diseases (25.72%), Bacterial and Viral diseases (21.41%),), Gyneco-obstetrical cases (17.34%) and lowest Metabolic and Nutritional diseases (8.61%).In winter, the highest prevalence were Bacterial and Viral diseases (34.06%) followed by parasitic diseases (25.46%), Digestive diseases (15.0%), Gyneco-obstetrical cases (12.96%), lowest Metabolic and Nutritional diseases (12.5%) .In rainy season, the highest value were parasitic diseases (31.35%) followed by Bacterial and Viral diseases (28.59%), Gyneco-obstetrical cases (17.54%), Digestive diseases (14.78%) and the lowest value were Metabolic and Nutritional diseases (7.73%).

Table 3: Season wise prevalence of diseases and disorders in cattle

Diseases (cattle)		Summer		Rainy		Winter		P-value
		Affected (n)	%	Affected (n)	%	Affected (n)	%	
Gyneco-obstetrical	Retained placenta	4	2.75	12	9.44	4	4.82	0.045
	Repeat breeding	35	24.14	15	11.81	18	21.69	
	Teat fistula	5	3.44	2	1.57	3	3.61	
	Abortion	20	13.79	5	3.94	4	4.81	
	Dystocia	24	16.55	43	35.86	17	20.48	
	Pyometra	12	8.28	8	6.30	2	2.41	
	Anestrus	35	24.13	30	23.62	25	30.12	
	Uterine prolapse	4	2.75	12	9.44	6	7.22	
	Vaginal prolapse	6	4.14	-	-	4	4.81	
Sub total		**145**	**17.34**	**127**	**17.54**	**83**	**12.96**	
Metabolic and nutritional	Grass tetany	2	2.78	13	23.21	16	20.0	0.006
	Downer's cow syndrome	8	11.11	6	10.71	13	16.25	
	Acidosis	30	41.67	22	39.28	22	27.50	
	Ketosis	15	20.83	2	3.57	8	10.0	
	Milk fever	17	23.61	13	23.21	21	26.25	
Sub total		**72**	**8.61**	**56**	**7.73**	**80**	**12.5**	
Bacterial and viral	Foot and mouth disease	38	21.22	55	26.57	85	38.99	0.00
	Rabies	27	15.08	65	31.40	9	4.13	
	Haemorrhagic Septicemia	9	5.02	4	1.93	6	2.75	
	Actinobacillosis	5	2.79	6	2.90	-	-	
	Foot Rot	4	2.23	7	3.38	12	5.50	
	Contagious Ecthyma	6	3.35	9	4.35	8	3.67	
	Black Quarter	21	11.73	13	6.28	9	4.13	
	Tetanus	6	3.35	6	2.90	4	1.83	
	Pneumonia	14	7.82	3	1.44	28	12.84	
	Mastitis	42	3.91	4	16.91	7	3.21	
	Warts	7	23.46	35	1.93	50	12.94	
Sub total		**179**	**21.41**	**207**	**28.59**	**218**	**34.06**	
Parasitic	Fasioliasis	57	26.51	87	38.33	45	27.60	0.018
	Tick Infestation	85	39.53	41	18.06	42	25.77	
	Hump Sore	6	2.79	15	6.60	3	1.84	
	Bottle Jaw	3	1.39	11	4.85	23	14.11	
	Maggot	45	20.93	68	29.07	6	3.68	
	Mite Infestation	19	8.83	7	3.08	44	26.99	
Sub total		**215**	**25.72**	**227**	**31.35**	**163**	**25.46**	
Digestive	Bloat	51	22.67	14	13.08	15	15.63	
	Diarrhea	88	39.11	37	34.58	21	21.88	
	Dysentery	35	15.55	22	20.56	26	27.04	
	Dehydration	25	11.11	15	14.01	18	18.75	
	Anorexia	26	11.55	19	17.76	16	16.67	
Sub total		**225**	**26.92**	**107**	**14.78**	**96**	**15.0**	0.00
TOTAL		**836**	**100**	**724**	**99.99**	**640**	**99.98**	

P<0.05 means significant at 5% level of significance

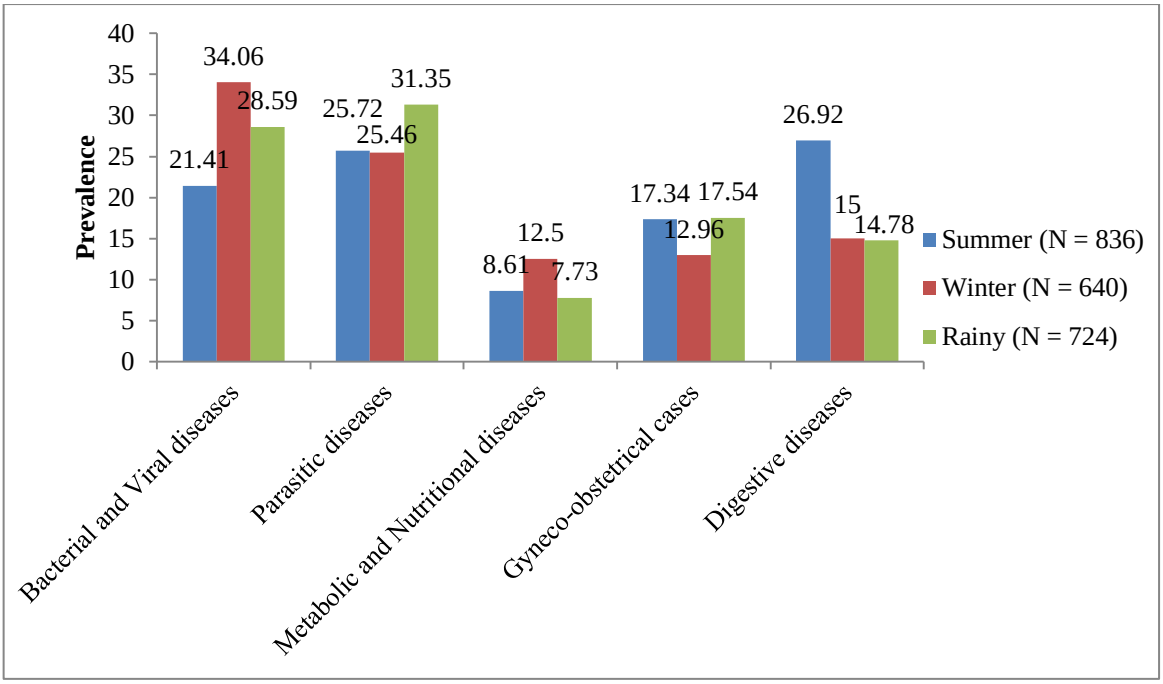

Fig. 5: Season wise prevalence of diseases and disorders in cattle

4.4 Season wise prevalence of diseases and disorders in goat

The prevalence of diseases and disorders in goat based on season were shown in table 4. The highest prevalence was Digestive diseases (23.46%) followed by Metabolic and Nutritional diseases (20.37%), Gyneco-obstetrical cases (19.75%), parasitic diseases (19.13%) and the lowest value were Bacterial and Viral diseases (17.28%). In winter, the highest prevalence were Bacterial and Viral diseases (39.86%), followed by Metabolic and Nutritional diseases (17.39%), parasitic diseases (17.39%), Gyneco-obstetrical cases (15.21%), and the lowest value were Digestive diseases(10.14%).In rainy season, the highest value were Bacterial and Viral diseases (36.66%) followed by parasitic diseases (35.33%), Digestive diseases(10.66%), Metabolic and Nutritional diseases (9.33%) and the lowest value were Gyneco-obstetrical cases (8.0%).

Table 4: Season wise prevalence of diseases and disorders in goat

Diseases (goat)		Summer		Rainy		Winter		P-value
		Affected (n)	%	Affected (n)	%	Affected (n)	%	
Gyneco-obstetrical	Retained placenta	5	15.63	1	8.33	1	4.76	0.012
	Repeat breeding	7	21.88	2	16.66	1	4.76	
	Teat fistula	1	3.13	1	8.33	4	19.04	
	Abortion	4	12.5	1	8.33	2	9.52	
	Dystocia	1	3.13	3	25.0	3	14.28	
	Pyometra	5	15.63	2	16.66	2	9.52	
	Anestrus	8	25.0	1	8.33	6	28.57	
	Uterine prolapse	1	3.13	1	8.33	2	9.52	
Sub total		**32**	**19.75**	**12**	**8.0**	**21**	**15.21**	
Metabolic and nutritional	Acidosis	20	60.61	6	42.96	14	58.33	0.023
	Ketosis	13	39.39	8	57.14	10	41.67	
Sub total		**33**	**20.37**	**14**	**9.33**	**24**	**17.39**	
Bacterial and viral	Peste Des Petits Ruminants	5	17.85	10	18.18	19	34.55	0.00
	Rabies	4	14.28	9	16.36	5	9.09	
	Foot Rot	6	21.43	6	10.90	8	14.54	
	Contagious Ecthyma	3	10.71	8	14.54	2	3.64	
	Tetanus	1	3.57	2	3.64	2	3.64	
	Pneumonia	2	7.14	7	12.73	5	9.09	
	Mastitis	7	25.0	13	23.63	14	25.45	
Sub total		**28**	**17.28**	**55**	**36.66**	**55**	**39.86**	
Parasitic	Fasioliasis	10	32.26	30	56.60	13	54.12	0.00
	Tick Infestation	8	25.81	12	22.64	7	29.17	
	Maggot	9	29.03	11	20.75	3	12.5	
	Mite Infestation	4	12.90	-	-	1	4.12	
Sub total		**31**	**19.13**	**53**	**35.33**	**24**	**17.39**	
Digestive	Bloat	8	21.05	3	18.75	3	21.43	0.001
	Diarrhea	12	31.57	4	25.0	3	21.43	
	Dysentery	7	18.42	5	31.25	1	7.14	
	Dehydration	6	15.79	1	6.25	4	28.57	
	Anorexia	5	13.15	3	18.75	3	21.43	
Sub total		**38**	**23.46**	**16**	**10.66**	**14**	**10.14**	
TOTAL		**162**	**99.99**	**150**	**99.98**	**138**	**99.99**	

P<0.05 means significant at 5% level of significance

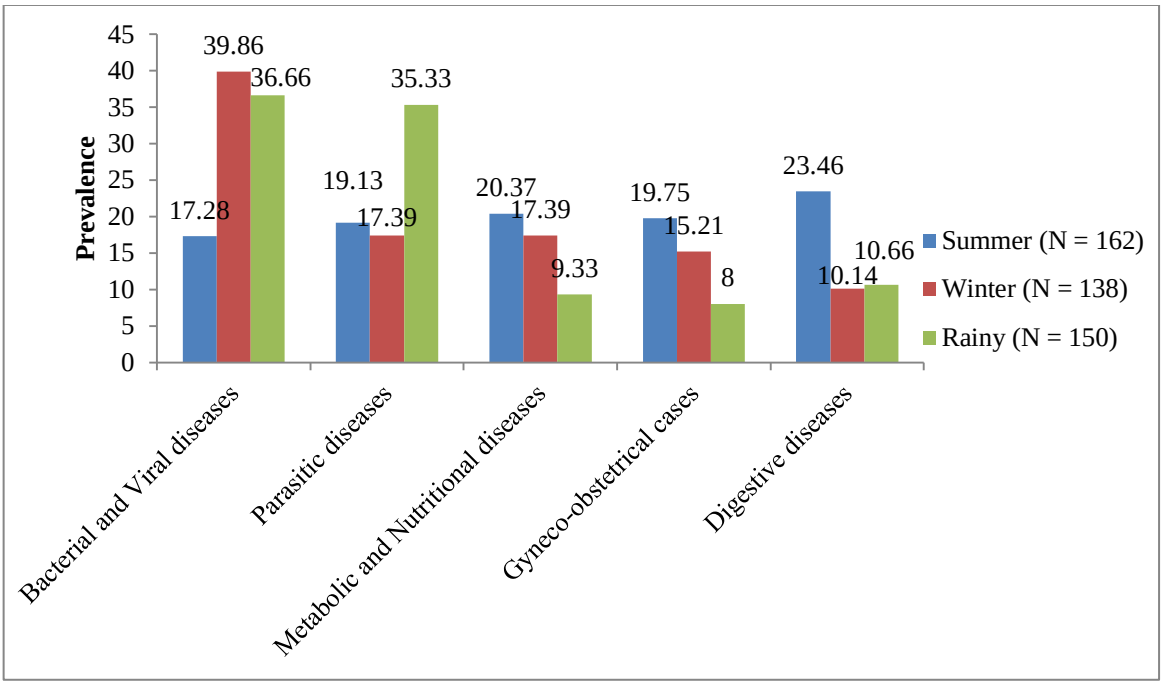

Fig. 6: Season wise prevalence of diseases and disorders in goat

4.5 Sex wise prevalence of diseases and disorders in cattle

The prevalence of diseases and disorders in cattle based on age were shown in table 5. In male, the highest prevalence were parasitic diseases (36.49%) followed by Bacterial and Viral diseases (32.10%), Digestive diseases (27.81%) and the lowest value were Metabolic and Nutritional diseases (3.59%). In female, the highest prevalence was Gyneco-obstetrical cases (28.23%) followed by Bacterial and Viral diseases (21.30%), parasitic diseases (18.29%), Digestive diseases (16.87%) and the lowest value were Metabolic and Nutritional diseases (15.28%).

Table 5: Sex wise prevalence of diseases in cattle at Bagherpara Upazila in Jessore District

Diseases (cattle)		Male		Female		P-value
		Affected (n)	%	Affected (n)	%	
Gyneco-obstetrical	Retained placenta			20	5.91	
	Repeat breeding			88	26.04	
	Teat fistula			11	3.25	
	Abortion			30	8.87	
	Dystocia			85	25.15	
	Pyometra			26	7.69	
	Anestrus			65	19.23	
	Uterine prolapse			8	2.36	
	Vaginal prolapse			5	1.48	
Sub total				**338**	**28.23**	
Metabolic and nutritional	Grass tetany	1	2.77	35	19.13	0.020
	Downer's cow syndrome	-	-	30	16.39	
	Acidosis	33	91.66	35	19.13	
	Ketosis	2	5.56	30	16.39	
	Milk fever	-	-	53	28.96	
Sub total		**36**	**3.59**	**183**	**15.28**	
Bacterial and viral	Foot and mouth disease	132	40.99	95	37.25	0.01
	Rabies	35	10.87	65	25.49	
	Haemorrhagic Septicemia	6	1.86	6	2.35	
	Actinobacillosis	12	3.73	3	1.18	
	Foot Rot	24	7.45	9	3.53	
	Contagious Ecthyma	32	9.94	8	3.14	
	Black Quarter	30	9.32	5	1.96	
	Tetanus	11	3.42	6	2.35	
	Pneumonia	25	7.76	7	2.75	
	Mastitis	-	-	8	3.14	
	Warts	15	4.66	43	16.86	
Sub total		**322**	**32.10**	**255**	**21.30**	
Parasitic	Fasioliasis	112	30.60	65	29.68	0.00
	Tick Infestation	85	23.22	70	31.96	
	Hump Sore	20	5.46	6	2.74	
	Bottle Jaw	28	7.65	9	4.11	
	Maggot	75	20.49	38	17.35	
	Mite Infestation	46	12.57	31	14.15	
Sub total		**368**	**36.49**	**219**	**18.29**	
Digestive	Bloat	46	16.49	25	12.38	0.024
	Diarrhea	115	41.22	70	34.65	
	Dysentery	35	12.54	35	17.33	
	Dehydration	55	19.71	55	27.22	
	Anorexia	28	10.04	17	8.42	
Sub total		**279**	**27.81**	**202**	**16.87**	
TOTAL		**1003**	**99.99**	**1197**	**99.97**	

P<0.05 means significant at 5% level of significance

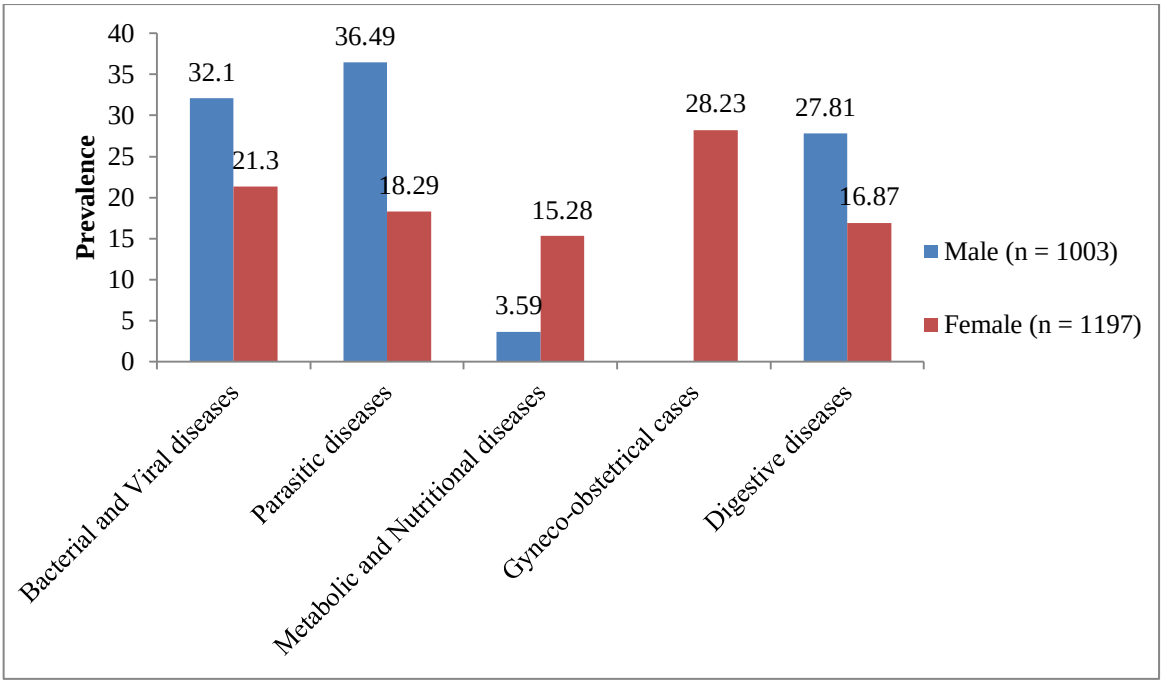

Fig. 7: Sex wise prevalence of diseases and disorders in cattle

4.6 Sex wise prevalence of diseases and disorders in goat

The prevalence of diseases and disorders in goat based on age were shown in table 6. The highest prevalence was Bacterial and Viral diseases (38.30%) followed by parasitic diseases (27.36%), Digestive diseases (20.39%) and the lowest value were Metabolic and Nutritional diseases (13.93%). In female, the highest prevalence Gyneco-obstetrical cases (26.10%) followed by Bacterial and Viral diseases (24.50%), parasitic diseases (21.28%), Metabolic and Nutritional diseases (16.87%) and the lowest value were Digestive diseases (11.24%).

Table 6: Sex wise prevalence of diseases in goat at Bagherpara Upazila in Jessore District

Diseases (goat)		Male		Female		P-value
		Affected (n)	%	Affected (n)	%	
Gyneco-obstetrical	Retained placenta			5	7.69	
	Repeat breeding			11	16.92	
	Teat fistula			6	9.23	
	Abortion			12	18.46	
	Dystocia			7	10.77	
	Pyometra			2	3.08	
	Anestrus			18	27.69	
	Uterine prolapse			4	6.15	
Sub total				**65**	**26.10**	
Metabolic and nutritional	Acidosis	20	71.43	25	59.52	0.393
	Ketosis	8	28.57	17	40.48	
Sub total		**28**	**13.93**	**42**	**16.87**	
Bacterial and viral	Peste Des Petits Ruminants	21	27.27	18	29.51	0.002
	Rabies	13	16.88	8	13.11	
	Foot Rot	11	14.29	6	9.83	
	Contagious Ecthyma	15	19.48	9	14.75	
	Tetanus	7	9.09	3	4.92	
	Pneumonia	10	12.98	5	8.20	
	Mastitis	-	-	16	26.22	
Sub total		**77**	**38.30**	**61**	**24.50**	
Parasitic	Fasioliasis	9	16.36	9	16.98	0.191
	Tick Infestation	28	50.91	17	32.07	
	Maggot	14	25.45	22	41.51	
	Mite Infestation	4	7.27	5	9.43	
Sub total		**55**	**27.36**	**53**	**21.28**	
Digestive	Bloat	9	21.95	6	21.43	0.007
	Diarrhea	12	29.27	11	39.28	
	Dysentery	5	12.20	3	10.71	
	Dehydration	4	9.76	2	7.14	
	Anorexia	11	26.83	6	21.43	
Sub total		**41**	**20.39**	**28**	**11.24**	
TOTAL		**201**	**99.98**	**249**	**99.99**	

$P<0.05$ means significant at 5% level of significance

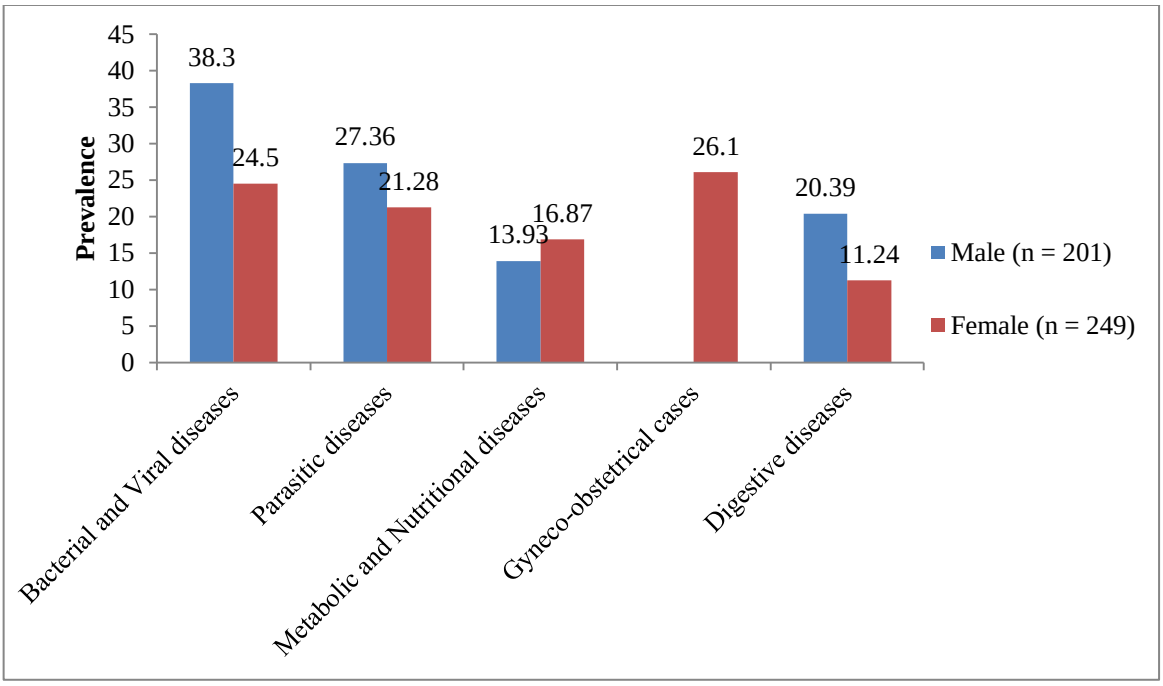

Fig. 8: Sex wise Prevalence of Diseases and Disorders in Goat

4.7 Results of commercial drugs against PPR (Peste des Petits Ruminants) in goat

In this study, 15 animals were taken and divided into three groups (Group-A, Group -B, Group-C). Among this Group -A Contain 5 animals and treated with Gentasone plus (Gentamicin 30 mg + Sulphadimidine 125 mg + Trimethoprim 25 mg) @ 1ml per 10 kg body weight IM injection. Group-B Contain 5 animals and treated with Gentacin 5% (Gentamicin 50 mg) @ 1 ml per 10 kg body weight IM injection. Group-C Contain 5 animals and treated with Gentacin 10% (Gentamicin 100 mg) @ 1 ml per 10 kg body weight IM injection. The result of PPR recovery time of Group-A animals were significantly ($p<0.05$) earlier on 4.6±0.40 than animals of Group-C (6.2±0.38) and Group-B (6.8±0.37) respectively.

Table 7: Results of commercial drugs against PPR affected goats (Peste des Petits Ruminants)

Name of the group	No.of animals treated	Name of anti-bacterial drug	Dose and route of administration	Result of recovery (Days)	Level of significance
Group-A	5	Gentasone plus (Gentamicin +Sulphadimidine +Trimethoprim)	1 ml per 10 kg body weight IM	4.6 ± 0.40^{a}	*
Group-B	5	Gentacin 5% (Gentamicin 50 mg)	1 ml per 10 kg body weight IM	6.8 ± 0.37^{b}	
Group-C	5	Gentacin 10% (Gentamicin 100 mg)	1 ml per 10 kg body weight IM	6.2 ± 0.38^{b}	

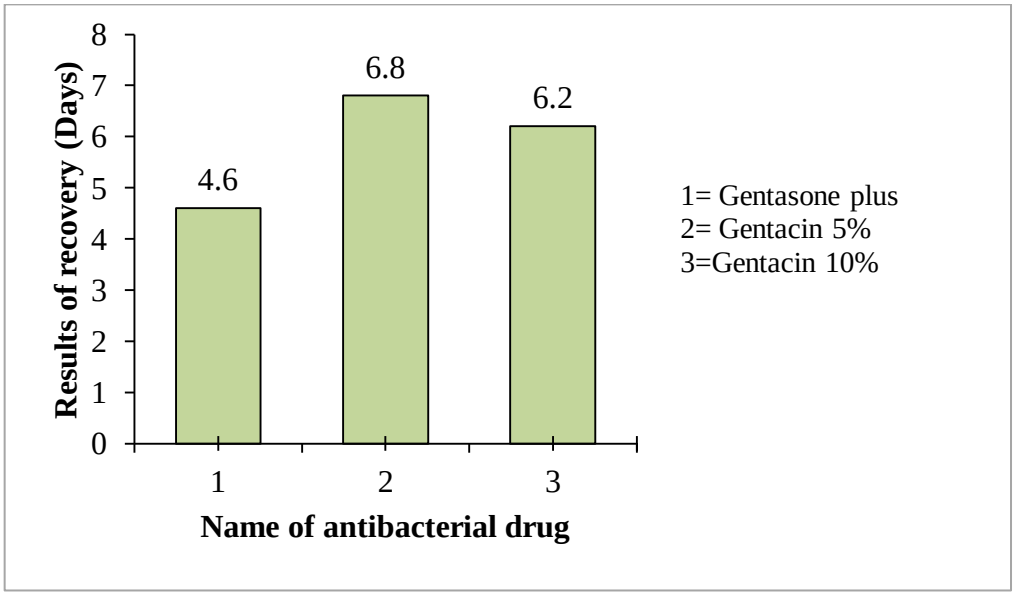

Fig. 9: Results of commercial drugs against PPR (Peste des Petits Ruminants) in goat

CHAPTER V

DISSCUSSION

5.1 Gyneco-obstetrical cases

In this study the overall prevalence of gyneco-obstetrical cases were recorded 16.27% and 12.22% in cattle and goats respectively. Diseases were recorded in different seasons in this study was 12.96% in winter, 17.54% in rainy, 17.34% in summer season in cattle where in goat 15.21% in winter, 8.0% in rainy and 19.75% in summer season. Female cattle 28.23% and female goat 26.10% were affected in present studies. All the findings are in close agreement with the findings of Karim *et al.,* (2014), Rahman *et al.*, (2012), Samad (2001), Kabir *et al.,* (2010) and Moktar *et al.*, (2017).

5.1.1 Repeat breeding

Repeat breeding was found in 18.09% in cattle and 9.09% in goats which is much higher than the findings of Samad (2001) found repeat breeding in 1.26% cattle and 0.24% goats. The variation might be due to geographical and dietary variation. In the present study, repeat breeding in cattle was recorded as 21.69% in winter followed by summer (24.14%) and rainy seasons (11.81%). On the other hand, in goats, the rate was 4.76 in winter, 21.88% in summer and 16.66% in rainy seasons. The disease in female cattle was 26.04% and 16.92% in female goat. Rahman *et al.,* (2012) recorded repeat breeding case in 16.2% cattle and 20% goats which slightly higher than present study. They also reported that the highest rate of repeat breeding in cattle was found in winter (20%) as compared to summer (15.8%) which is slightly lower from my study and rainy seasons (12.5%). At Upazilla Veterinary Hospital, Ulipur, Kurigram, Kabir *et al.,* (2010) found only 4 (1.15%) repeat breeding cases among 348 investigated cattle.

5.1.2 Anestrus

The disease was recorded in 25.13% in cattle and 27.27% in goats. The anestrus in cattle was during winter (30.12%), followed by summer (24.13%) and rainy seasons (23.62%) in the present study and in goat was (28.57%) in winter followed by summer (25.0%) and (28.57%) in rainy seasons. Anestrus in cattle was in female (19.23%) and (27.69%) in goat. This disorder was observed in cattle 59.5% during the study period of Rahman *et al.,* (2012) and during winter (80%) was recorded which followed by rainy (75%) and

summer (42.1%) seasons. Samad (2001) worked on anestrus case and reported 0.86% in cattle and 0.47% in goats. The present result was lower than the result of Rahman *et al.,* (2012) but higher than Samad (2000) and Moktar *et al.,* (2017) due to geographical distribution.

5.1.3 Retained placenta

The disease was found in cattle 5.03% and in goats 9.09% (in this examination. The retained placenta in cattle was (4.82%) during winter, followed by summer (2.75%) and rainy seasons (9.44%) and in goat was (15.63%) in summer, followed by winter (4.76) and rainy seasons (8.33). This disease in cattle was in female (5.91%) and in female goat was (7.69%). The disorder was only 8.1% recorded in cows by Rahman *et al.,* (2012). They also reported that the cases of retained placenta were 10.5% and 12.5% in summer and rainy season respectively. Karim *et al.,* (2014) recorded this disorder only 30% in cows and 50% in does. My study result is similar with Rahman *et al.,* (2012) but dissimilar with Karim *et al.,* (2014) due to dietary variation.

5.1.4 Abortion

In the current study abortion was recorded 7.26% in cattle and 9.09% in goats. The disease in cattle was (4.81%) in winter, followed by summer (13.79%), (3.94%) in rainy seasons and in goat was during winter (9.52%), followed by (12.5%) in summer season and (8.33) in rainy season. This case in cattle was (8.87%) and in goat (18.46%) in female.

5.1.5 Teat fistula

The circumstance is 1.68% in cattle and 7.27% in goats was recorded. The teat fistula in cattle was (3.61%) during winter, (3.44%) in summer and 1, 57% in rainy season and in goat was (19.04%) in winter season, followed by (8.33%) in rainy season and (3.13%). The disease in cattle was (3.25%) and in goat was (9.23%) in female in present study.

5.1.6 Pyometra

Pyometra was identified in cattle 6.70% and in goats 12.73% .The disease in cattle was (2.41%) during winter, followed by summer (8.28%) and (6.30%) in rainy seasons and in goat was (15.63%) in summer, (16.66%) in rainy seasons and (9.52%) in winter season

.The case in cattle was (7.69%) and in goat was (3.08%) in female .Sheldon *et al.,* (2006) worked on pyometra cases in animal.

5.1.7 Uterine prolapse

In the present study, 8.38% cattle and 1.33% goats were affected with uterine prolapsed. The disease in cattle was during winter (7.22%), followed by summer (2.75%) and rainy seasons (9.44%) and in goat was (9.52%) in winter season, followed by (8.33%) in rainy season and (3.13%) in summer season. This case was in female (2.36%) in cattle and (6.15%) in goat. Ishii *et al.,* (2010) also studied on uterine prolapse.. The cases of uterine prolapse were found only in summer season both in cows and does and that was in 2.7% and 20.0% in respectively (Rahman *et al.,* 2012) which is dissimilar from my study.

5.1.8 Vaginal prolapse

In the current study the disease was recorded 3.07 % in cattle and was (4.14%) during summer and (4.81%) in winter seasons. This case was not found in goat during the study period. Vaginal prolapse deliberated by Miesner and Anderson (2008) and Ahmed *et al.,* (2005) which is similar with my study. The occurrence in beef cattle has been recorded 39% vaginal and 45% uterine prolapse which have been allied with dystocia.

5.1.9 Dystocia

The prevalence of dystocia was 23.74% in cattle and 14.55% in goats. The disease in cattle was 20.48% in winter followed by summer (16.55%) and rainy seasons (35.86%), and in goats, the rate was 14.28% in winter, followed by 3.13% in summer and 25.0% in rainy seasons. The rate of dystocia in cattle was 25.15%, and in goats, it was 10.77%. Rahman *et al.,* (2012) described the disease of dystocia was recorded in 1.1% cows which is higher than my study and 20% does nearly similar with my study.

5.2 metabolic and nutritional diseases

5.2.1 Grass tetany

This disease was recorded in 16.21% in cattle. The grass tetany in cattle was recorded as 20.0% in winter, followed by rainy season (23.21%) and summer season (2.78). It was found in 19.13% female cattle and in male cattle 2.77%.

5.2.2 Downer's cow syndrome

This disease was recorded in 13.51% cattle, and it was 16.25% during winter followed by summer (11.11%) and (10.71%) rainy seasons. On the other hand, it was 16.39% in female. Karim *et al.,* (2014) stated that the cows during the dry period and fed a ratio of 15% crude protein had a 69.4% incidence of metabolic diseases and a 31% incidence of the downer cows syndrome which is higher than my study.

5.2.3 Acidosis

Acidosis was documented 37.84% in cattle and in goats 57.70%.During winter the disease in cattle was (27.50%), followed by summer (41.67%) and (39.28%) in rainy seasons and in goat was (58.33%) in winter, followed by summer (60.61%) and (42.86%) in rainy seasons. In the present investigation, it was (91.66%) in male and was (19.13%) in female in cattle and was (71.43%) in male and was (59.52%) in female in goat .Duffield (2000) worked on acidosis and declared that the acidosis is produced when oxygen levels in the body was fallen.

5.2.4 Ketosis

This disease 10.81% in cattle and 42.31% in goats was evidenced .Ketosis in cattle was 10.0% in winter, followed by 20.83% in summer and 3.57% in rainy season. Similarly, in goats, the rate was 39.39%, 41.67% and 57.14% in summer, winter and rainy seasons, respectively. In cattle, ketosis was 5.56% in male and 16.39% in female, and in goats, it was 28.57% in male and 40.48% in female. An occurrence of 34% ketosis has been reported by Duffield *et al.,* (2000) and Moktar *et al.,* (2017) which is dissimilar from my study.

5.2.5 Milk fever

Milk fever was recorded as 21.62% in cattle. However, it was 26.25% during winter followed by summer (23.61%) and (23.21%) in rainy seasons in cattle. In cattle, Milk fever was 28.96% in female. Bar and Ezra (2005) observed clinical hypocalcemia before, during or after calving caused by milk fever. Thirunavukkarasu *et al.,* (2010) reported that among the 3774 cows in five milk sheds at the State of Tamil Nadu, 516 (13.67%) were affected with milk fever. Hutjens (2003) studied on Israeli Holstein cows and reported that 8% of the pretentious animals died and culled were 12% of them due to milk fever which is comparatively lower from my study.

5.3 Bacterial and viral diseases

5.3.1 Foot and mouth disease

In the current study, FMD was found in 33.61% cattle, and was 38.99% in winter, followed by summer (21.22%) and rainy (26.57%) seasons in cattle. The rate of FMD in male was 40.99%, and in female, it was 37.25% in cattle. Rahman *et al.,* (2012) stated 1.79% cases of FMD in cattle and 0.08% in goats which is significantly lower from my study.

5.3.2 Rabies

Rabies was recorded in cattle (16.81%) and goats (10.34%).In cattle, the disease was 4.13% in winter followed by summer (15.08%) and rainy (31.40%) seasons, and in goats, it was 9.09% in winter followed by summer (14.28%) and rainy (16.36%) seasons .The rabies in cattle was 10.87% in males and 25.49% in females and was 16.88% in males and 13.11% in female goats. Tekki *et al.,* (2014) explained that the rabies in cattle, sheep and goats is a deadly disease caused by a virus that attacks the nervous system.

5.3.3 Mastitis

Mastitis found in cattle was 17.64% and in goats 27.58% .The case in cattle was (22.94%) during winter, followed by summer (23.46%) and (16.91%) in rainy seasons and in goat was (25.45%) during winter, followed by summer (25.0%) and (23.63%) in rainy season .Mastitis was (16.86%) in cattle and in goat was (26.22%) in female. Mastitis in cows 1.1% and in doe 1.6% was recognized and by Karim *et al.,* (2014). Rahman *et al.,* (2012), Samad (2001) and Moktar *et al.,* (2017) accounted the clinical mastitis in cows as 0.89% and 0.9%, respectively which is lower than my findings.

5.3.4 Hemorrhagic septicemia

This disease was recorded 1.68% in cattle and was (5.02%) in summer, (1.93%) in rainy seasons and (2.75%) in winter season. It was in male (1.86%) and female (2.35%) in cattle. The prevalence of this disease has been well renowned (Shivachandra *et al.,* 2011). The case of HS was also worked by Shafarin *et al.,* (2009) on goat which is similar with my study.

5.3.5 Actinobacillosis

Actinobacillosis was recorded 1.34% in cattle and was (2.79%) in summer and (2.90%) in rainy seasons. The disease was (3.73%) in male and female (1.18%) in cattle. Vadillo *et al.,* (2002) and Radostits *et al.,* (2007) reported that actinobacillosis is an infectious disease with a worldwide distribution that often affects the soft tissues of cattle and sheep. In cattle, the classical presentation of infection affects by actinobacillosis diseases described by Taghipmy *et al.,* (2010), Angelo *et al.,* (2009) and Moktar *et al.,* (2017).

5.3.6 Foot rot

Foot rot was found in cattle (2.52%) and goats (10.34). The disease was 5.50% prevalent in cattle during winter, followed by summer (2.23%) and rainy (3.38%) seasons, and in goats, it was 14.54% in winter, followed by summer (21.43%) and rainy (10.90%) seasons. In cattle, it was 7.45% in males and 3.53% in females, and in goats, it was 14.29% in males and 9.83% in females. John and Webb (2005) stated that the foot rot is an transferable disease of cattle, sheep and goats and in the medium to high rainfall areas it was the mostly found.

5.3.7 Contagious echthyma

This disease was identified (3.36%) in cattle and (13.79%) in goat. In cattle the disease was (3.67%) during winter, followed by summer (3.35%) and (4.35%) in rainy seasons and in goat was (3.64%) during winter followed by summer (10.71%) and (14.54%) in rainy seasons .The disease in cattle was in male (9.94%) and female (3.14%) and in goat was (19.48%) in male and (14.75%) in female.

5.3.8 Black quarter

This disease was recorded in 6.72% cattle .The black quarter (BQ) in cattle was 4.13% in winter, followed by summer (11.73%) and rainy (6.28%) seasons, and was 9.32% in males and 1.96% in female cattle. BQ was recorded in 1.4% cattle, as reported by Karim *et al.,* (2014) which is significantly lower from my findings.

5.3.9 Tetanus

Tetanus was documented in 2.52% cattle and 6.96% goats. In cattle, the disease occurrence was 1.83% in winter, followed by summer (3.35%) and rainy (2.90%)

seasons, and in goats, it was 3.64% in winter, followed by summer (3.57%) and rainy (3.64%) seasons. The disease in cattle was in male (3.42%) and female (2.35%) and in goat was (9.09%) in male and (4.92%) in female. Karim *et al.,* (2014) confirmed 0.5% tetanus cases in goats which is dissimilar from my study. This variation might be due to difference is geographical location, host and management practices.

5.3.10 Pneumonia

Pneumonia was found 9.24% in cattle and in goats 10.34%.The case in cattle was (12.84%) during winter, followed by summer (7.82%) and (1.44%) rainy seasons and in goat was during winter (9.09%), followed by summer (7.14%) and (12.73%) rainy seasons .In cattle, it was 7.76% in males and 2.75% in female, whereas in goats, it was 12.98% in males and 8.20% in females .Similar results were reported by Rahman *et al.,* (2012) and Moktar *et al.,* (2017), who reported 5.1% pneumonia in cattle and 16.8% in goats. My reports are relatively higher than the reports of Samad (2001) who accounted 0.84% in cattle and 1.24% in goats, respectively.

5.3.11 Warts

Warts were recorded in 4.53% cattle. The rate of wart during winter was 3.21%, followed by summer (3.91%) and rainy (1.93%) seasons in cattle. The disease in cattle was in male (4.46%) and in female (3.14%). In cattle, 0.7% cases of papillomatosis were observed by Karim *et al.,* (2014) which is lower than my findings. In cattle, Samad (2001) showed 0.58% and Rahman *et al.,* (2012) showed 0.19% occurrence of warts in Bangladesh which is dissimilar with my study.

5.3.12 Peste des petits ruminants (PPR)

PPR was found 20.69% in goats. In goat PPR was (34.55%) during winter, followed by summer (17.85%) and rainy seasons (18.18%) and was in male (27.27%) and (29.51%) in female. These results did not sustain the result of Rahman *et al.,* (2012) who stated that the PPR case was 5.2% in goats. Kabir *et al.,* (2010) recorded total 11 diseases and disorders in 115 clinical cases and observed at the Upazilla veterinary hospital, Ulipur, Kurigram 33 (28.69%) goats affected with PPR which is similar with my findings. In Magura, Karim *et al.,* (2014) documented 5.3% cases of PPR in goats at the Mohammadpur Upazilla veterinary hospital which is lower than my study. Samad (2001); Rahman *et al.,* (2012) also reported the PPR cases were 1.1% and 5.2% in goats,

respectively which is significantly lower than my study due to geographical distribution and dietary variation.

5.4 Parasitic diseases

5.4.1 Fasioliasis

In cattle, the rate was 35.71% and in goats, it was 20.83%. The fasioliasis in cattle was 27.60% in winter, followed by summer (26.51%) and rainy (38.33%) seasons, and in goats, it was 54.12% in winter, followed by summer (32.26%) and rainy (56.60%) seasons. The fasioliasis in cattle was 30.60% in males and 29.68% in females, whereas in goats, it was 16.36% in males and 16.98% in females. Kabir *et al.,* (2010) and Moktar *et al.,* (2017) studied and established that 10.44% goats were affected with fascioliasis which is lower than my study.

5.4.2 Tick infestation

Tick infestation was found in cattle 26.98% and 37.5% in goats. In cattle, the rate was 25.77% during winter, followed by summer (39.53%) and rainy (18.06%) seasons, and in goats, it was 29.17% in winter, followed by summer (25.81%) and rainy (22.64%) seasons. The Tick infestation in cattle was 23.22% in males and 31.96% in females, whereas in goats, it was 50.91% in males and 32.07% in females. Rony *et al.,* (2010) conducted a study in Gazipur of Bangladesh and recorded 68.49%, 65.5%, 65.4% and 64.07% prevalence of tick infestation in cattle respectively which was higher than my result.

5.4.3 Hump sore

Hump sore was recorded in 4.76% cattle. During winter, hump sore in cattle was 1.84%, followed by summer (2.79%) and rainy (6.60%) seasons. The disease in cattle was 5.46% in males and 2.74% in females. Singh *et al.,* (2014) recorded hump sore in indigenous cattle as 22.60%, whereas in exotic cattle and crossbred, it was 36.64%. The infection rate was 29.25% in males and 21.84% in females. They also established that the prevalence was maximum (47.13%) in rainy season, followed by summer (21.64%) and winter (8.76%) seasons which is significantly higher than my findings due to geographical distribution.

5.4.4 Bottle jaw

Bottle jaw was recorded 7.14% in cattle. It was (14.11%) during winter, followed by summer (1.39%) and (4.85%) in rainy seasons in cattle. This case was (7.65%) in male and (4.11%) in female. Bottle jaw that has been documented in 2.27% in cattle and 3.48% in calves up to one year old (Samad, 2001) which is lower than my study.

5.4.5 Maggot

Maggot was found 16.67% in cattle and in goats 29.16%.In cattle the maggot infestation was during winter (3.68%), followed by summer (20.93%) and (29.07%) in rainy seasons and in goat was during winter (12.5%), followed by summer (29.03%) and (20.75%) in rainy seasons .It was in cattle (20.49%) in male and female (17.35%) and in goat was in male (25.45%) and (41.51%) in female .In the cross bred cattle 53% of the affected cases were found (Rahman *et al.,* 2009) which is higher than my result.

5.4.6 Mite infestation

Mite infestation 8.73% in cattle and 12.50% in goats was recorded .It was in cattle during winter (26.99%), followed by summer (8.83%) and rainy seasons (3.08%) and in goat was (12.90%) in summer and (4.12%) in winter seasons. This case in cattle was (12.57%) in male and female (14.15%) and in goat was in male (7.27%) and (9.43%) female. Baker (2003) worked on the mite infestation which causes ulcerative dermatitis and skin damaged.

5.5 Digestive diseases

5.5.1 Bloat

Bloat was recorded in 19.68% cattle and 30.77% goats. In cattle, bloat was found in winter (15.63%), followed by summer (22.67%) and rainy (13.08%) seasons and in goat was 21.43% during winter, followed by summer (21.05%) and rainy (18.75%) seasons. This case in cattle was (16.49%) in male and female (12.38%) and in goat was in male (21.95%) and (21.43%) female. The observation recorded by Karim *et al.,* (2014) was 2.5% in cattle and 2.6% in goats which is lower than my findings. The incidence of bloat was 2.2% in cattle and in goat it was 2.5% (Rahman *et al.,* 2012). My study is higher than Rahman *et al.,* (2012) and Moktar *et al.,* (2017).

5.5.2 Diarrhea

Diarrhea was presented 34.72% in cattle and 32.05% in goats. This case in cattle was (21.88%) during winter, followed by summer (39.11%) and (34.58%) in rainy seasons and in goat was (21.43%) during winter, followed by summer (31.57%) and (25.0%) rainy seasons. It was (41.22%) in male and female (34.65%) in cattle and in goat was in male (29.27%) and (39.28 %) in female .The cases of diarrhea were in cattle 7.6% and in goats 12.1% found at the veterinary clinics of Patuakhali Science and Technology University by Rahman *et al.,* (2012). They also reported the highest percentage was recorded (8.4%) during summer season, followed by (7.5%) in winter and (7.3%) in rainy season which is dissimilar from my study.

5.5.3 Dysentery

Dysentery was recorded 16.67% in cattle and 15.38% in goats. The disease in cattle was (27.08%) during winter followed by summer (15.55%) and (20.56%) in rainy seasons and in goat was during winter (7.14%), followed by summer (18.42%) and (31.25%) rainy seasons. The dysentery in cattle was in male (12.54%) and female (17.33%) and in goat was in male (12.20%) and (10.71%) female .This case was recorded in cattle (1.1%) and goats (6.3%), as reported by Karim *et al.,* (2014) which is lower than my study. Samad (2001) stated in cattle it was 1.76%, and in goats it was 1.87% which is significantly lower than my findings.

5.5.4 Dehydration

Dehydration was found in 13.88% cattle and 3.85% goats, as mentioned in the. In cattle, dehydration was 18.75% during winter, followed by summer (11.11%) and rainy (14.01%) seasons, and in goats, the rates were 28.57% during winter, 15.79% in summer and 6.25% in rainy season .In cattle, it was 19.71% in males and 27.22% in females, and in goats, it was 9.76% in males and 7.14% in females. Smith (2005) studied on clinical signs of dehydration in cattle and goats and found almost similar results.

5.5.5 Anorexia

Anorexia was recorded in cattle 15.05% and 17.95% in goats. Cattle were affected by the anorexia during in winter (16.67%), followed by summer (11.55%) and (17.76%) rainy seasons and in goat during winter (21.43%), followed by summer (13.15 and (18.75%) rainy seasons. The anorexia in cattle was in male (10.04%) and female (8.42%) and in goat was in male (26.83%) and (21.43%) in female. Within 348 cattle and 115 goats anorexic condition observed in cattle 11 (3.17%) and 7 (6.09%) in goat (Kabir *et al.*, 2010 and Moktar *et al.*, 2017) which is lower than my findings.

CHAPTER VI

CONCLUSIONS

On the basis of present finding the following conclusions may be inferred:

- In cattle, the highest prevalence was seen by parasitic diseases (28.64%) and lowest metabolic and nutritional diseases (8.41%). In goat, the highest prevalence was by bacterial and viral diseases (32.22%) and lowest metabolic and nutritional diseases (11.55%).

- Bacterial and viral diseases (34.06%) were found higher in winter season where as digestive diseases (26.92%) in summer season and parasitic diseases (31.35%) in rainy season in both cattle and goats.

- Metabolic and nutritional diseases were higher in female animals whereas infectious diseases, parasitic diseases and digestive diseases were higher in male animals.

- In therapeutic efficacy of drugs against PPR affected goats Gentasone plus is more effective followed by 5% Gentacin and 10% Gentacin due to synergistic reaction of antibiotics that exert more effective action against the secondary bacterial infection.

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