

Chapter 1: Introduction

Being an agriculture-based country in the world, livestock has been an important component of the mixed farming system practiced in Bangladesh for centuries. Livestock plays an important role on the agricultural economy of Bangladesh. About 80% of our population is employed in agriculture and livestock farming. 20% people are involved in livestock sector for their livelihood. The contribution of livestock in the magnitude of Gross Domestic Product (GDP) is about 16.23 % in Bangladesh (BBS, 2008).

Goats, as far as known, were probably the first domesticated animals (Herre and Rohrs, 2001). And in Bangladesh goats are called the poor man's cow. Hence steps has been taken to persuade rural poor people to rear goats more previously Goat Rearing Campaign was run by the Bangladesh government. Rural women generally find rearing goats easier than other animals as goats are smaller in size and easier to handle. In Bangladesh mainly indigenous Black Bengal Goats are reared in 80% cases (DLS, 2010).

Livestock is considered to be an efficient tool for poverty reduction throughout the world. It is recorded that about 75% of the World's 1.5 billion poor live in country side of the developing world and 66% of these people keep livestock (Thornton *et al.*, 2002). Goats contribute 48% of the total livestock population of Bangladesh. The magnitude of contribution of the livestock sector to the GDP is 2.6% in Bangladesh and 80% rural people rear indigenous animals. The present population of cattle, goat and sheep are 23 million, 22.4 million and 2.8 million respectively (DLS, 2010).

The management practices of animals and geo-climatic condition of Bangladesh are suitable for the occurrence of various diseases and disorders in goats. The prevalence of diseases in goats sometimes varies with the species, ages, sex of the goats and season of the year (Haque and Samad, 1997)

Livestock disease is one of the main important hindrances towards the development of the livestock. PPR is said to be the most dangerous disease in case of goats which being highly contagious cause great loss to farmers especially during cold months (Sill *et al.*, 1995).

Consequently the direct impacts of diseases in goats include loss of productivity, through the death or slaughter of the animals, meat and reduce productive capacity. Parasitism is said to be the main obstrucater in livestock rearing in Bangladesh. Goats suffer from various internal and external parasitic diseases. Qadir (1967) observed *Haemonchus contortus*, *Oesophagostomum columbianum*, *Strongyloides spp.*, *Trichuris spp.*, and *Trichostrongylus spp.* in goats. Incidence throughout the year was high with *Haemonchous contortus* and *Oesophagostmum* without any significant seasonal variations. Rahman *et al.*, (1975) studied goat diseases of Mymensingh and reported 8.3% Fascioliasis among goat population. Rahman and Razzak (1973) examined fecal samples of 833 goats where a total of 16.3% animals were positive for *Fasciola* infection. In Bangladesh, Bhuyan (1970) investigated Fascioliasis in which 12.92% of goats were infested with *Fasciola gigantica*.

Besides parasitic diseases, some other important infectious diseases like FMD, PPR, mastitis and non-infectious diseases like milk fever, dystocia, acidosis, pregnancy toxemia etc. causes a great loss of export market, effect on human health, effect on social status etc. Banerjee *et al.*, (1985) recorded 5.8% and 42.22% prevalence rates of pneumonia and other lung affections in goats detected at slaughter and postmortem examination respectively. Reader and Obi (1999) reported that PPR was not clearly recognizable up to 1972, but the true extend of the disease has become apparent in recent years and is still being clarified. Sill *et al.*, (1995) reported PPR spread throughout the country and had devastating effects in organized Goat Farms.

Rahman and Samad (1984) studied the diseases of goat in some areas of Bangladesh and reported 12% mastitis, 10% Colibacillosis, 5% Salmonellosis and 7% Otitis externa. Ali *et al.*, (1987) recorded 2.17% incidence of respiratory disorders in Black Bengal goats and 24.24% mortality in Bengal goat due to pneumonia.

Along with the common diseases sometimes some other diseases like naval ill, actinomycosis etc are seen in goat. Both external and internal parasites make goats suffer, cause loss to the farmers (Rahman *et al.*, 2000). Different skin diseases along with myiasis are commonly seen and dangerous for goats (Rashid *et al.*, 1996). Nooruddin *et al.*, (1987) reported higher prevalence of skin disease (26.80%) in Black Bengal goats under rural condition of Bangladesh. Huq and Mollah (1969) reported that the prevalence of lice on sheep and goats in Mymensingh and Dhaka were found 36.20% in goats.

Baghaichari Upazilla under Rangamati district is also known for its own diversity and scope for livestock farming. Goats are here the second best livestock after cattle. The approximate population of goat in Baghaichari is 26,000 according to the locals. Baghaichari Upazilla Veterinary Hospital plays a vital role through providing the best possible service in terms of treatment with modern equipments to cure and control diseases as much as possible. Therefore, a study was conducted at Baghaichari for 8 months during the internship training program with following objectives:

- i) To determine the prevalence of different diseases and disorders in Goat.
- ii) To find whether there is any seasonal influence in disease invasion.

Chapter 2: Materials and Methods

Study area:

The study was conducted at Upazilla Veterinary Hospital, Baghaichari, Rangamatito determine the prevalence of diseases and disorder in Goat. The study period was 8 months starting from January to August of 2015.

Methods of data collection:

The sick or injured animals brought for the treatment to this hospital were registered at first in the registered book of the Veterinary Hospital. The owners' complains as well as signs and findings were recorded in the registered book.

Reference population

All the livestock that were brought in Baghaichari Upazilla Veterinary hospital were considered to be the reference population.

Source of population

Household raising at least one goat with history and clinical sign of diseases or disorders were considered to be the study population.

Study population

Baghaichari Upazilla is a hilly area where communication and transportation facilities are shocking, less number of cases is found in the Upazilla Veterinary Hospital. In total 199 cases of goat were recorded in that period.

Population and tools used for data collection

The sick animals brought for the treatment to this hospital were registered at first in the registered book. There were two ways of to have attended patients, one was clinic at which farmers willingly came with the patient with their complaints and another was at field where veterinary surgeon along with me went to the field for registration of diseased animals. The age and other clinical history of sick animal

were determined by asking the owner. A total of 199 goats were brought to the UVH during my internship period and general clinical examinations were conducted according to the merit of the cases. Sick animals are considered significantly for the diagnostic purposes were collected.

Table 1 : Registration form

Case no:	Owner's address	Species	Sex	Age	Body weight	Owner's Complain	Diagnosis	Prognosis	Remarks

Detection of diseases either by clinically or physical examination

P.P.R (Peste des petits Ruminants):

P.P.R is very common and fetal diseases of goat. The main features of this disease are-

- High fever (106-107°F)
- Necrotic erosion with ulceration on the lips and tongue
- Oculo-nasal discharge and Respiratory distress.
- Profuse diarrhea

Tetanus:

Tetanus is caused by the toxin *Clostridium tetani*. It is clinically characterized by-

- Hyperesthesia
- Convulsion
- Stiff gait
- Lock jaw

Retained placenta:

Retained placenta most commonly found in cows, buffaloes and goats. Animal was considered to have her placenta retained if she was unable to expel it within 12 hours of parturition.

Goat Pox:

Pox is very highly infectious and contagious viral zoonotic disease of goats characterized by sequential skin lesion -

Macule > papule > vesicle > pustule > scar.

Prognosis of goat pox was recorded to be grave.

Abscess:

Abscess is the circumscribed cavity containing pus. It was diagnosed by the palpation and needle puncture.

Simple Indigestion:

Simple indigestion which is very common in poor feed management system is actually diagnosed by the following characteristics -

- Absence of ruminal motility
- Swollen belly
- Anorexia and then total off-fed
- No rise in temperature

Parasitic Infestation:

Being a poor and illiterate country, here farmers lack the knowledge about how the parasitic infestation reduces the productivity and profitability in farming. Parasitic infestation can be of two types in gross- a. Internal and b. External. Internal parasitic infestation is often detected by laboratory and microscopic examination whereas external parasitism can be diagnosed by observing clinical signs as following-

- Rough hair coat
- Skin lesions and itching
- Loss of body weight and unthriftiness
- Emaciation

Common cold:

Common cold in goats was diagnosed by the general mild respiratory distress, nasal discharge and slight raise in the temperature.

Navel ill:

Inflammatory lesions on the umbilicus in calves within three months of age were considered as navel ill and is characterized by –

- Swollen and pain on umbilicus
- Draining of pus

Myiasis:

Due to poor management and unhygienic condition of the farm house, Myiasis is often seen in goats with following signs-

- Skin lesion with bad odour
- Larvae of fly are sometimes found

Malnutrition:

Following signs define malnutrition in goats

- Poor BCS
- Retarded growth

Mastitis:

Inflammation of mammary gland is characterized by physical, chemical and bacteriological changes in milk and pathological changes in mammary gland. It was diagnosed by-

- Anorexia
- High fever
- Curd like consistency in milk
- Swollen udder

Statistical Evaluation:

Data obtained were entered into Microsoft Excel 2010 for analysis. Descriptive analysis was performed. Results were expressed as frequency and percentage.

Chapter 3: Results

This study was carried out to determine the general clinical prevalence of diseases in goat in Baghaichari Upazilla Veterinary Hospital of Rangamati from January to August, 2015. A total of 16 diseases were recorded in 199 goat cases during the study period (Table 2).

Table 2: Prevalence of different diseases and disorder of goat (n=199)

Diseases and Disorders	Number of Cases	Prevalence (%)
Peste des petits	37	18.5
External Parasitism	9	4.5
Internal parasitism	23	11.5
Dermatitis	7	3.5
Mastitis	1	0.5
Goat Pox	31	15.5
Malnutrition	8	4
Dog Bite	6	3
Retained Placenta	2	1
Common Cold	12	6
Abscess	7	3.5
Myiasis	9	4.5
Simple Indigestion	13	6.5
Surgical cases	32	16
Tetanus	2	1
Naval Ill	1	0.5
Total	199	100

The results showed that 18.5% (n=37) goats are infected by PPR, 4.5% (n=37) with external parasitic infestation, 11.5% (n=23) with internal parasitic infestation, 3.5% (n=7) with Dermatitis, 0.5% (n=1) with Mastitis, 15.5% (n=31) with goat Pox, 4% (n=8) with Malnutrition, 3% (n=06) with dog bite, 1% (n=2) with retained placenta, 6% (n=12) with Common Cold, 3.5% (n=7) with Abscess, 4.5% (n=9) with Myiasis, 6.5% (n=Simple Indigestion), 16% (n=32) with surgical cases, 1% (n=2) with Tetanus and 0.5% (n=1) with naval ill. All the recorded diseases of cattle were

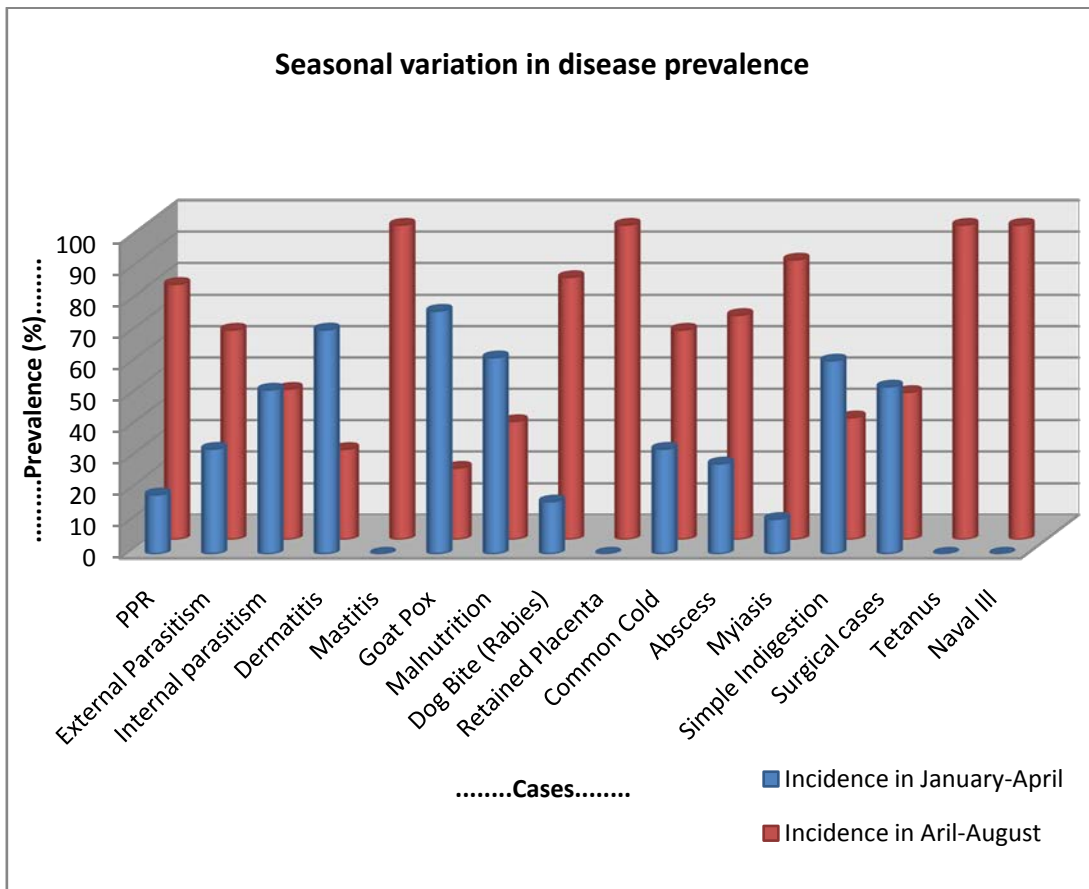
classified into groups like parasitic, bacterial, viral, reproductive diseases and other diseases and data entry was done month-wise.

In table 3, seasonal variation of incidence of different diseases in Baghaichari presented what is again graphically presented in Graph 1, while total disease incidence variation shown in graph 2. This shows that the incidence of disease occurrence is 44.7% during January- April and 55.3% during May-August.

Table 3: Month-wise variations in Disease incidence

Diseases/Disorders	January-April		May-August		Total Number of Cases
	Number of cases	Incidence (%)	Number of Cases	Incidence (%)	
Pestis des petits	7	18.9	30	81.1	37
External Parasitism	3	33.3	6	66.7	9
Internal parasitism	12	52.2	11	47.8	23
Dermatitis	5	71.4	2	28.6	7
Mastitis	0	0	1	100	1
Goat Pox	24	77.4	7	22.6	31
Malnutrition	5	62.5	3	37.5	8
Dog Bite	1	16.6	5	83.3	6
Retained Placenta	0	0	1	100	1
Common Cold	4	33.3	8	66.7	12
Abscess	2	28.6	5	71.4	7
Myiasis	1	11.1	8	88.9	9
Simple Indigestion	8	61.5	5	38.5	13
Surgical cases	17	53.1	15	46.9	32
Tetanus	0	0	2	100	2
Naval Ill	0	0	1	100	1
Total	89	44.7	110	55.3	199

Graph 1: Seasonal variation in disease prevalence



Graph 2: Seasonal variation disease occurrence

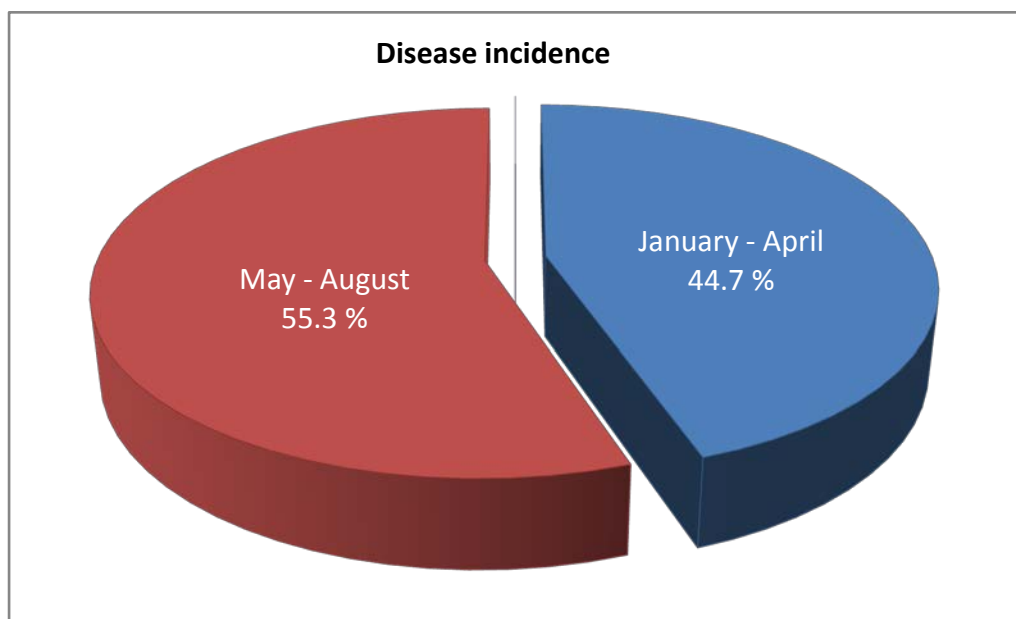


Figure: Seasonal variation in Disease

Chapter 4: Discussion

The prevalence of PPR was 18.5% which was highest among other diseases. This findings supports the findings of previous research (Sarker *et al.*, 2011), which was 20.57%. And prevalence of PPR during January-April is quite higher (81.1%) than that (18.9%) of May-August. This is assumed to be due to the rain during the month of July and August in Bangladesh, as goats are susceptible to rain and cold. This seasonal variation in incidence of PPR does not support the research findings of Sarker *et al.*, (2011) and Debnath (1995) where it was reported that PPR occurs mostly by December. May be it is due to the lack of data during December.

External and internal parasitic infestation was recorded to be 4.5% and 11.5% respectively. No major seasonal fluctuation was seen, though external parasitism seemed to be higher (66.7%) in incidence during June-August. Confirmatory due to lack of Microscope in the UVH, so no confirmatory diagnosis was possible. Khajuria and Kapoor (2003) reported the same things about parasitic infestation in sheep and goat. The people of the Baghaichari are not only poor but also uneducated. There is lack of consciousness about the necessity of regular deworming of the livestock which leads to more parasitic infestation cases (Rajkova *et al.*, 2005).

The prevalence of Goat pox was found to be second highest (15.5%). Being a viral disease, goat pox is a very fatal disease with grave prognosis most of the times. Season plays role on the incidence of Pox. 77.6% of Pox was recorded in the cold months (January-April). This finding supports the research data of Rao *et al.*, (2000) where winter or dry season was claimed to be favorable for the Pox in goat.

The prevalence of surgical Cases was 16% (n=32) where 26 cases were of Castration and the rest 6 were brought for accidental injury. There was no significant role of season seen for surgical cases. As the market demand of castrated goat is higher than the non-castrated and castration also helps in weight gain, farmers are being more and more interested in castrating their goat kids. (Nadia, 2006).

There were some rare cases for a hilly area like Mastitis (0.5%), Tetanus (1%) and naval ill (0.5%). Tetanus was caused by the faulty castration produces in the Baghaichari UVH. Naval ill being a very rare in case goat was found 0.5%. Though mastitis is less common in goat, it is recorded to be in subclinical form in goat (Linzell and Peaker, 1972) and sometimes naval ill also seen in goats due to infection in naval (Shearer 1986). Only 1 case was found with retained placenta what was maybe from malnutrition, hormone imbalance as reported by Muller and Owens (1974) and Jooster *et al.*, (1988).

6.5% Simple Indigestion was recorded during the study. It is very common in educationally area due to lack of knowledge about proper feeding practices for goat. And 66.7% of those cases were recorded during January-April, as the animals can grass enough at pasture land in the spring after winter is over (Nema *et al.*, 2003).

12% of the total population were suffering from common cold, among whose 66.7% were recorded during May-August time period which is actually rainy season in Bangladesh. It is because goats are more susceptible to cold and rain.

In my study it was found that total number of diseases found in the January-April (44.7%) time period is less than that of May-August period (55.3%), which shows that rainy season (June-July-August in Bangladesh) affects the goat's immunity by causing environmental stress. This study supports the research findings of Kashem *et al.*, (2011) where authors reported that disease prevalence is higher during rainy season in Goat.

Limitations

The study area is located in a remote area of the Rangamati town having no good transport facilities. Moreover the hill people are not well off at all to carry their sick or injured animals from the hills to the UVH that is why the number of cases per day there is significantly less than other places. Only 199 cases of goats recorded in this 8 months duration of my study. Besides this, the register books are not properly maintained. Age, sex, breed etc. boxes are often left blank which hinders in proper analysis of the disease prevalence.

Conclusion

Poverty and lack of education among the rural people who mostly rear goats are the main hinders to the better profitability and productivity. It can be concluded that PPR and parasitism causing the greatest health issues in goats, and goats are more susceptible to diseases during monsoon (May- August) in Bangladesh.

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The Author

Biography

I am Sumadhu Chakrabarty, son of SuvashChakrbarty and Nany Chakrabarty. I was born and brought up in Chittagong, Bangladesh. I passed my Secondary School Certificate (SSC) examination in 2007 with CGPA 5 and then Higher Secondary School Certificate (HSC) in 2009. I am now doing my internship of my graduation under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University. I feel strong passion for reading books and writings and have special interest in Medicine, Sciences, Literature and Philosophy. I would like to do research on Pet medicine and have plans to works for the street dogs' betterment and to render services in order to develop veterinary field as a vet practitioner.