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|  |  |
| --- | --- |
| Abbreviation and symbol | Elaboration |
| BB | Black Bengal |
| CAE | Caprine Arthritis Encephalitis |
| CAEV | Caprine Arthritis Encephalitis Virus |
| DLS | District Livestock services |
| FAO | Food and Agriculture Organization |
| GDP | Gross Domestic Product |
| JP | Jamunapari |
| L | Local |
| PPR | Peste des Petis Ruminants |
| PPRV | Peste des Petis Ruminants Virus |
| URTI | Upper respiratory tract infection |
| www | World Wide Web |

## List of Abbreviations

## Abstract

Goat is an important source of nutrition and integral part of rural economy in Bangladesh. Goats are infected by several infectious diseases which can affect their growth. This study was conducted to investigate the prevalence of common infectious diseases of goat in Panchlaish thana, Chittagong, Bangladesh. The study was carried out in Thana veterinary hospital, Panchlaish, Chittagong in between February 2014 to March 2014. The diseases were diagnosed on basis of clinical signs and owner's statement. The prevalence of Peste des Petis of Ruminant (PPR) was highest 21 (31.34%) whereas babesiosis was less common 1 (1.49%). The prevalence of infectious disease was highest in 7-12 month age group 9 (90%) and lowest at >24 month age group 3 (33.33%). The prevalence of infectious disease was highest at Black Bengal 10 (90.9%) and lowest in Jamunapari breed 14 (45.15%). Prevalence of PPR was found highest both for male and female goat. Female goat was found to be more susceptible 13 (72.96%) than the male animal 27 (43.33%). These results indicate the high incidence of various infectious diseases in the goats of Chittagong region (Panchlaish Thana). 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.

**Keywords:** Prevalence, Infectious, Goat, Bangladesh

## PLAGIARISM CERTIFICATE

Myself Rifatul Erfan strongly assures that I have performed all works furnished here in this report. The Information’s have been collected from books, national and international journals, websites and other references. All references have been acknowledged duly.

Therefore, I hold entire responsibility of collection, compilation, preservation and publication of all data accumulated here in this report.

----------------------------

 **The Author**

 **January, 2015**

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# CHAPTER 1

## INTRODUCTION

Goats are reared by farmers mostly as a subsidiary occupation or by poor people in Bangladesh. It is more a way of life rather than a commercial enterprise and goat herds provide substantial part of farmer's income. Goat meat and skin ranked 38.0% and 28.0% respectively, of the total meat and skin produced from livestock in Bangladesh (FAO, 1997).

Goats participate in a vital position with lasting agricultural farming, employment generation as well as enhance the traditional economy of Bangladesh. Goats husbandry is one of the most important sources of incomes for rural families, marginal farmers, children, landless laborers and distress women who cannot afford to rear cattle, hence, goat is called "The cow of poor people" in Bangladesh. They provide mainly milk, meat, hides and skins as important export item. There are about 20.75 million goats in Bangladesh. This goats acquired second placement with regards to meat, milk along with skin manufacturing addressing information about 38.0%, 23.0% in addition to 28.0% respectively around the overall contribution involving livestock in Bangladesh (Devendra, 2007).

The disease is endemic in the Arabian Peninsula (Taylor *et al.* 1990), the Middle East and in the Indian subcontinent (Shaila *et al.* 1996).

 But there is no well organized goat farm in Bangladesh. People rears goat in backyard system. Goats are highly susceptible to many diseases, and backyard farming system is most responsible for this. Ravages caused by diseases act as one of the prime production limiting factors in goats all over the world. Effective disease management plays an integral part of goats development programme to optimize the productivity of these animals. Infectious diseases are significant impediments to the economical rearing of small ruminants (Radostits *et al.* 2000). Even though goats are considered as a minor species in the Bangladesh, the goat industry is recognized as one of the fastest growing Bangladesh livestock sectors. However, caprine diseases have not received much attention in the Bangladesh compared with the degree of attention that bovine diseases have received in recent years. No studies have been conducted to provide valid estimates of prevalence of diseases in goat at Chittagong region of Bangladesh. Valid estimates of prevalence of diseases in goats at both the animal and herd level are needed by industry stakeholders to determine whether the disease warrants interventions to mitigate its negative impact on herd profitability. In affected goat herds, possible intervention goals could include eradication efforts in the event of very low prevalence, institution of a long-term risk-based control program that emphasizes management changes in high prevalence herds, and surveillance in the event of likely absence of infection.

The objectives of this study were:

1. To know about common diseases in goat and their prevalence.
2. To know which sex, age and breeds of goat is most susceptible to infectious diseases.

# CHAPTER 2

## REVIEW OF LITERATURE

### 2.1 Incidence of disease in goat

Any disease which affects the well-being of a dairy goat will reduce milk production, either directly through the effects on the individual animals, or indirectly through a reduction in fertility of the herd and therefore in the initiation of new lactations (The wide range of diseases that can affect goats is illustrated below). The severity of the impact on milk production will depend on the severity and nature of the disease. Thus some diseases will have little effect on herd productivity, such as isolated cases of carcinoma (Rajan *et al.* 1982); or a more general effect, such as with pneumonia (Hidalgo 1987); or a specific effect on fertility, such as with toxoplasma (Dubey 1987); or an effect both on goats and humans, such as with brucellosis (Kolar 1987). However, seldom have the effects of these diseases been quantified in terms of a reduction of milk production. At times the effects are severe, as for example when a herd of 700 goats had to be destroyed in California because of an outbreak of mycoplasmosis (Damassa *et al.* 1987); or when a herd of dairy goats in Zimbabwe had to be slaughtered because they were infected with CAEV (Harrison 1988).

A wide range of diseases can affect goats, and dairy goats in particular (Williams 1981), and herd health programmes should be instituted to prevent these (Bliss 1984; Guss 1983; Lebbie *et al.*1996). However, goats kept extensively in communal grazing areas may be remarkably free of internal parasites and diseases (Obwolo 1991). Management and husbandry are particularly important during kid-rearing in intensive systems (Morand-Fehr 1985). This section of the review will only briefly consider various diseases.

###  2.1.1 Infectious Diseases

Any infectious diseases have been documented, including: brucellosis (Kolar 1987; Singh, Vihan & Lalwani 1992); tuberculosis (Bernabe *et al.* 1991); Johne's disease (Singh, Vihan & Gupta 1992); enterotoxaemia (Ayers 1984b; Harbola & Ratan 1992); mycoplasma (Damassa & Brooks 1987; Jones 1989; Wesonga *et al.* 1993); caseous lym- phadenitis (Dercksen *et al.* 1996; Gezon *et al.* 1991; Gonzalez & Tortora 1992; Olander & Brown 1987); toxoplasmosis (Dubey 1987); pox (Mallick, Das, Goswami & Kishore1992); foot-and-mouth disease (Shankar *et al.* 1992); pneumonia (Hidalgo 1987); mycosis (Chattopadhyay *et al.* 1992); coccidiosis (Smith 1984), and other diarrhoeal diseases (Ayers, 1984a), such as colibacillosis (Singh, Vihan & Tiwari 1992; Vihan 1992a,b). Recent reviews have listed diseases affecting goats: bacterial (Sherman 1992); viral (Mallick, Shankar & Bansal 1992); protozoal and metazoal (Dubey 1992). Foot-and-mouth disease (Shankar *et al.* 1992); pneumonia (Hidalgo 1987); mycosis (Chattopadhyay *et al.* 1992); coccidiosis (Smith 1984), and other diarrhoeal diseases (Ayers 1984a), such as colibacillosis (Singh, Vihan & Tiwari 1992; Vihan 1992a,b).

Recent reviews have listed diseases affecting goats: bacterial (Sherman 1992); viral (Mallick, Shankar& Bansal 1992); protozoal and metazoal (Dubey 1992).

### 2.1.2Coccidiosis

Coccidiosis is often considered to be a disease of intensification, affecting goat kids in particular (Vihan 1992b). However, it may also occur under more extensive conditions (Chhabra & Pandey 1992; Shrestha *et al.* 1992). One paper has reported cerebrocortical necrosis from treatment with amprolium (Lonkar & Prasad 1992). Monensin has been shown to reduce the effects of coccidiosis in lambs (Muwalla *et al.* 1994). Mortality rates of as high as 10% of does and 65% of kids have been reported (Sanchez *et al.* 1992). In another study, mortality from coccidiosis was 47% of a mortality rate of 9.9% of deaths from parasitic diseases (adults and kids), with most of the deaths occurring from three to six months of age (Sharma *et al.* 1992). It is possible that other infections may contribute to the effects ascribed to coccidiosis. In this regard, the identification of rotavirus in the MEDUNSA herd may be significant (DaCosta Mendes *et al.* 1994). Rotavirus has also been identified in goats in Spain (Munoz *et al.* 1994).

### 2.1.3 Caprine arthritis encephalitis (CAE)

Particular note in recent years has been the extent and severity of Caprine Arthritis Encephalitis Virus (CAEV) (Adams *et al.* 1984). Although no reactors were reported from South Africa, one case was documented in Mozambique (Lopes Pereira *et al.* 1989), and in a research herd in Zimbabwe (Harrison 1988). Transmission appears to be through body fluids, primarily colostrum (East *et al.* 1993). All breeds, age and sex is less or more susceptible to this disease, this disease is very important in many countries of the world (Perrin & Polack 1992). Extension programmes have had some success in eradicating CAE (Greenwood 1992).

### 2.1.4 Tick-borne Diseases

Tick-borne diseases of importance in South Africa include anaplasmosis (Barry & Van Niekerk, 1990) and heartwater (DuPlessis *et al.*1983; Stewart 1987). It is also a common disease of goat which may occur in any age and sex. These diseases are also important in other parts of Africa (Ilemobade 1982) and elsewhere (Matheron *et al.* 1987).

### 2.1.5 Heartwater

Heartwater is a disease caused by Cowdria ruminantium, transmitted by the tick Amblyomma hebraeum in South Africa (Walker & Olwage 1987). It affects cattle, sheep and goats in many parts of Southern Africa (van Winkelhoff & Uilenberg 1981) and elsewhere in the world (Matheron *et al.* 1987; Provost & Bezuidenhout 1987). Mortality has been reported to be high in Angora goats and Boer goats (Du Plessis *et al.* 1983; Du Plessis *et al.* 1986), but appears not to be well documented in other goat breeds in Southern Africa. Some degree of immunity can be induced by giving virulent heartwater blood and then blocking the disease with tetracycline when a temperature reaction is shown. However this procedure is risky, difficult to administer, and has a variable success rate (Poole, 1962; Du Plessis *et al.* 1983). Immunity is difficult to assess serologically, and may be of limited duration (Stewart 1987).

The disease is characterized by a temperature reaction, and by clinical signs that can be associated with pain, fluid accumulation, and with damage to the nervous system (Prozesky

1987), leading to rapid death. The pathogenesis is not well understood (Du Plessis *et al.* 1987). Du Plessis (1985) proposed a "reaction index" to grade the degree of reaction between animals. However, the ideal would be to identify a marker or indicator that would be a good predictor of potential resistance, without the risk of mortality inherent in the present system of a direct challenge with the disease. Such a marker would make it possible to select resistant animals and study the mode of inheritance, thereby expediting the development of a resistant breed at greatly reduced costs in terms of animal suffering and mortality. The mortality of this disease is too high, and this disease is greatly occurs in female. There is some indication that resistance to heartwater may be linked to the presence of serum conglutinin in cattle (Du Plessis 1985; Du Plessis & Bezuidenhout 1979; Du Plessis & Malan 1987; Lachman 1967).

### 2.1.5.1 Anaplasmosis

Far less research has been carried out on anaplasmosis in goats in South Africa than on heartwater (Barry & Van Niekerk, 1990). Females are most susceptible to this disease and all ages may infect. This is presumably because it is perceived to be a less significant disease in goats than in cattle (FAO 1994).

### 2.1.6 Mastitis

Although mastitis is usually an infectious disease, its importance in dairy goats as in dairy cattle justifies listing it separately. It can affect milk production through sub-clinical as well as clinical infections (East *et al.* 1987; Guss 1984).Only females are susceptible to this disease and it cannot occur before parturition. Losses are related, as with mastitis in dairy cows, to a reduction in milk production itself, as well as associated losses including the cost of treatment and the discarding of contaminated milk. However, such losses do not appear to have been quantified in dairy goat herds. Systems of controlling mastitis developed for dairy cows (Kingwill *et al.* 1979) should be applicable also dairy goats. Causative organisms documented include Mycoplasma (Hasso *et al.* 1993); and Staphylococci (Maisi & Riipinen 1991). Bacilli, coliforms, micrococci, streptococci, corynebacteria and Pseudomonas have also been isolated from goat milk samples, but were not necessarily associated with clinical signs (Kalogridou-Vassiliadou 1991).

### 2.1.7 Internal Parasites

Internal parasites can have a significant effect on the productivity of goats, especially in intensive management systems (Anderson 1982; Cabaret *et al.* 1989; Schillhorn VanVeen

1982), but infestation is not necessarily always high (Chartier *et al.* 1992). Mortality has been reported to be as high as 20% from haemonchosis (Sharma *et al.* 1992). Coenurosis may be high in some areas in India (Gogoi *et al.* 1992). Some evidence of genetic resistance to internal parasites has been reported (Gill *et al.* 1991; Pomroy 1996); in some circumstances, different breeds of dairy goats have responded differently to treatment, as illustrated by the report of Richard & Cabaret (1992), documenting the variation in response to fenbendazole used to treat lungworm.

### 2.1.8 Other Diseases

Other diseases documented include those related to external parasites (Murray 1982); malignant melanoma (El-Hassan & Ramadan 1982); and ethmoid carcinoma (Rajan *et al.* 1982). Digital lesions and lameness can be significant (Mgasa & Arnbjerg 1993). Footrot can also be caused by Bacteroides and Fusobacterium (Duran *et al.* 1990).

# CHAPTER 3

## MATERIALS AND METHODS

###

### 3.1 Study Area and Time

The study was conducted in Thana veterinary hospital, Panchlaish, Chittagong during the period of February and March, 2014. The diseases were diagnosed on basis of clinical signs and owner’s statement.

### 3.2 Sample Size

During this study period disease incidence of goats were recorded in hospital from which prevalence of infectious diseases were made. And they were categorized into breed, sex and age.

### 3.3 Physical Examination

Information of affected goats was recorded according to age, sex and breed. Body condition score, temperature, consistency of feces and any prominent clinical signs were also recorded. The body surface of calves and goat was examined for any swelling, wound or hernia ring or any outgrowth. The hindquarter and thigh muscles were observed to see lameness crepitation on palpation. The animals were palpated to detect any enlargement, reddening of udder or pain. In animals, mouth and feet were observed to detect any vesicle wound or salivation. Different joints of the animals were observed through palpation and were examined to detect any swelling or pain. Abnormal sound of respiratory tract was detected through stethoscope. The preputial mucosa and glans penis were examined for the presence of any purulent discharge or ulceration.

### 3.4 Clinical apparatus

Common clinical equipments were used during the study period. Those equipments are not enough to diagnose the diseases confirmly. So this study is made on the basis of tentative diagnosis. The equipments were used are:

1. Clinical thermometer
2. Stethoscope
3. Magnifying glass
4. Torch light etc.

|  |  |
| --- | --- |
| http://upload.wikimedia.org/wikipedia/commons/9/93/Clinical_thermometer_38.7.JPG | C:\Users\RAKIB\Downloads\stt.jpg |
| Clinical thermometer (mercury) | Stethoscope |
| C:\Users\RAKIB\Downloads\mg.jpg | C:\Users\RAKIB\Downloads\torc.JPG |
| Magnifying glass | Clinical torch |

Figure 1: Instruments used for physical examination

### 3.5 Disease Diagnosis

The viral, bacterial, protozoal, fungal and mixed infections were diagnosed by owner’s complaint & specific clinical signs of the diseases described by Kahn (2000) and Jones *et al.* (1998). The symptomatic signs used to presumptive diagnosis were made. The long-term and short-term history of the herd and patient should be considered. Environmental factors were carefully checked. The goat was observed as unobtrusively as possible respiratory rate and character was assessed before restraint, temperature and pulse (from the femoral artery) was taken immediately after the animal was restrained. The mucous membrane color was assessed in the conjunctival or vulval mucosa. Skin thickness and mobility was checked and any variation in temperature noted for evidence of local inflammation. Lymph node enlargement was palpated. The two sides of the head were compared to see if there was any disparity between them. The animal was examined for identifying difficulty of breathing, coughing and other signs of respiratory distress as per methods described by Jackson and Cockcroft (2002).

# CHAPTER 4

## RESULTS

The clinical investigation of infectious diseases was conducted in different breeds of goats registered at the Thana Veterinary Hospital, Panchlaish, during February and March 2014. Every goats registered here was clinically examined during the course of study. The investigation was carried out to determine the prevalence of infectious diseases in relation with breeds, age and sex.. A number of 67 goats of different breeds were brought to the hospital. Those 67 goats reported to the hospital 40(59.70%) was infected.The highest prevalence of infection was shown by PPR 21 (31.34%) and lowest was by Babesiosis 1 (1.49%). Occurrence of upper respiratory tract infection, pneumonia & diarrhea was recorded 8.95%, 5.97% and 11.94% respectively. According to age, 7- 12 month aged group was found to be more susceptible for various contagious diseases (90%). In 13-18 month and 7-12 month age group, highest prevalence was recorded in case of PPR (40%).

Table 1: Prevalence of diseases in relation to breed and age

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disease**  | **Breed** | **Sex** | **Age in months** | **Percent Prevalence (n=67)** |
| **JP (n=31)** | **BB (n=11)** | **L (n=25)** | **Male** **(n=30)** | **Female****(n=37)** | **0-6 (n=12)** | **7-12 (n=10)** | **13-18 (n=15)** | **19-24 (n=21)** | **>24 (n=9)** |
| **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** | **No. (%)** |
| **PPR** | 8 (25.80)  | 4 (36.36) | 9 (36.00) | 7 (23.33) | 14 (37.83) | 4 (33.33) | 4 (40.00) | 6 (40.00) | 4 (19.04) | 3 (33.33) | 21( 31.34) |
| **Pneumonia** | 2 (6.45) | 0 (0) | 2 (8.00) | 1 (3.33) | 3 (8.11) | 3 (25.00) | 1 (10.00) | 0 (0) | 0 (0) | 0 (0) | 4 (5.97) |
| **Babesiosis** | 0 (0) | 1 (9.09) | 0 (0) | 0 (0) | 1 (2.70) | 0 (0) | 0 (0) | 1 (6.67) | 0 (0) | 0 (0) | 1 (1.49) |
| **Diarrhoea (infectious)** | 3 (9.67) | 2 (18.18) | 3 (12.00) | 3 (10.00) | 5 (13.51) | 2 (16.67) | 2 (20.00) | 3 (20.00) | 1 (4.76) | 0 (0) | 8 (11.94) |
| **Upper respiratory tract infection** | 1 (3.23) | 3 (27.27) | 2 (8.00) | 2 (6.67) | 4 (10.81) | 2 (16.67) | 2 (20.00) | 1 (6.67) | 1 (4.76) | 0 (0) | 6 (8.95) |

Figure 2: Prevalence of diseases in relation to breed

Figure 3: Prevalence of diseases in relation to sex

Figure 4: Prevalence of diseases in relation to age

# CHAPTER 5

## DISCUSSION

Across the developing world, viral pathogens such as peste des petits ruminants virus (PPRV) place a huge disease burden on livestock production, in particular affecting small ruminant production and in turn increasing poverty in some of the poorest parts of the world like Bangladesh. PPR is a highly infectious viral disease of goat that can occur any time. The prevalence of PPR was highest 21 (31.34%). Occurrence of PPR was recorded highest in 7-12 month and 13-18month age group 4 (40%) and lowest in 19-24 months age group 4 (19.04%). Young goat found to be more susceptible for PPR than the adult. PPR outbreak was found to be higher in female 27 (27.83%) than male 13 (23.33%) goats. These results were almost similar to the findings of Abubakar (2008), Razmi et al. (2006) and Sarkar and Islam (2011).

Jumuna pari breed was found to be good in response to disease resistance. It was found that the prevalence of various infectious diseases was highest In BBG than other goat breeds. Breed susceptibility of various infectious diseases of this study is supported by the findings of Dey et al. (2007), Kashem et al. (2011) and Amir et al. (2001).

Female goats were more susceptible than the male. The present study further supports the observation of Greenwood et al. (1995) who found 58% of female goats were infected with infectious diseases.

# CHAPTER 6

## CONCLUSION

Infectious diseases are a global problem and considered as a major obstacle in the health and product performance of livestock specially goats. This study represents the prevalence of common diseases of goats in Bangladesh which has significant impact in overall production. The study documented high incidence of various infectious diseases in the goats of Chittagong region (Panchlaish thana). This is very alarming for the farmer. Veterinary inspection should pay attention for these all farm animals to detect the infectious diseases that may hamper the production of animals and make loss of the farmer. Government and private sectors should come forward to prevent and minimize the losses caused from the infectious disease. The present study will be helpful to control the diseases in the farm. Further investigation on infectious disease should be conducted to find out the source of various diseases.

# CHAPTER 7

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## ANNEX

**Thana Veterinary Hospital (Metro)**

**Panchlaish, Chittagong**

**Date:**

**Name of the Owner:**

**Address:**

**Duration of illness:**

**Species: Sex: Age:**

**Weight: Breed: BCS:**

**Physiological status: Grazing system: Colour:**

**Total No of animal: Feeding habit:**

**Owner’s complain:**

 **Temp.: Feces: Mouth lesion: Lacrimation:**

**Skin & Hair coat: Dehydration: Vaccination: Deworming:**

**Nasal discharge:**

**Diagnosis:**

**Treatment:**

**Advice:**

**Signature of TLO:**