

Diseases in nuclear breeding flock of Black Bengal Goat

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ABSTRACT

The objective of this study was to investigate the incidence of different diseases in a bio-secured goat farm at Bangladesh Agricultural University campus, Mymensingh. The diseases were recorded mainly on the basis of history, clinical signs and examination of organism. Higher incidence (%) of diseases was found for diarrhoea 17.4 followed by fever and anorexia (16.5), pneumonia (13.8), bloat (10.6), contagious ecthyma (8.3) and mixed parasitic infestation (7.0). Incidence of diseases had higher in adults (>1year) 40.0% than young goats (7-12months) 31.7% and kids (<6 months) 28.4, respectively. Higher incidences of diseases were found in rainy season (49.6%) and then winter (30.4%) and dry period (19.6%). The higher incidence of diseases in intensive rearing systems possibly due to increased stresses on animal, to which they responded by higher diseases incidence. Moreover, these animals were purchased from farmer level where they have lack of knowledge for preventive health care. This group of animals may act as carrier of many diseases and it might be the causes of higher incidence of diseases.

Keywords: Diseases, nuclear breeding flock, biosecured farm, goat, Bangladesh.

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INTRODUCTION

Bangladesh is a densely populated country in the world and the livestock has less attention in comparison to crop production. Though the number of Black Bengal goat in Bangladesh is in extinct condition, but its population is still 34.5 million (FAO, 2003).

Black Bengal goats are the potential genetic resource in Bangladesh. The productivity of goats is not outstanding in Bangladesh, but it is worldwide popular for its profound breeding value in terms of growth rate, adaptability, fertility, delicious meat (dressing percentage 55%), moderate milk yield (200-700gm), superior skin quality, and high prolificacy etc (Devendra and Burns, 1983; Devendra, 1985; Saadullah, 1991). Among the Asian countries, Bangladesh has the second highest population of the Black Bengal goat which accounted for about 7.40% of the total population in Asia (FAO, 1999) and is the third

highest repository of goat possessing (4.90%) of the world (Amin et al., 2000).

Goat is considered as the integral component of rural subsistence farming that play a key role for contribution of livestock improvement program for the alleviation of poverty and to improve the economic status of the rural people through self employment. Rearing of goats plays a vital role to poor, landless and marginal farmers as they required minimum management attention, very small financial investment, risk involvement is much less as compared to large ruminants, serve as a definite source of regular income, the demand and unit price of goat meat is much higher as compared to others and women and children can easily rear goat.

Having all these positive sites of goat rearing the major impediments in this sector are the diseases of this small ruminant. Scientific breeding, feeding, management and disease control are the

key points of success in livestock development. Keeping in view the important role of goats in rural farming of Bangladesh, a biosecurely nuclear breeder of Black Bengal Goat Farm has been established at Bangladesh Agricultural University campus through United States Department of Agriculture (USDA).

Under the preventive health care of this farm included, bio-security, health management (medication and treatment, vaccination and parasite control program) dipping, supplement of good nutrition and feeding management and predator management, the present work had been undertaken with a view to investigate the incidence of different diseases of goat in that bio-secured farm, to explore the diseases in different age, sex and seasons, to examine the clinical pathology of diseases and to study the morphological lesions (gross and microscopic) of the organs arising from different diseases.

MATERIALS AND METHODS

In order to investigate the incidence of various diseases of goat, a total number of 114 goat population of different age groups and sexes were examined during the period of October, 2007 to October, 2008 in this nuclear breeding flock of Black Bengal Goat. The percent of incidence of different diseases was calculated on the basis of animals suffered out of total number of diseased animals. The following materials were used and methods were followed in this experiment.

Experiment

Out of 114, there were 72 female and 42 male goats of different ages in the farm. All animals were neckband tagged to maintain individual identity. Separate data sheet for each animal was maintained for recording data. The influence of the age of goat, sex and seasonal variation on the incidence of diseases was studied by dividing the infected goat into three age groups (Group-1 up to 6 months, Group-2 above 6 to 12 months, Group-3 above 12 months) and also seasonal variation by dividing Season-1(March-June) dry period and Season-2 (July-October) rainy season and Season-3 (November-February) winter. In this farm, the biosecurity procedures strictly maintained. The

farm also maintained the health management programmed (medication and treatment, vaccination and parasite control program) dipping, supplement of good nutrition and feeding management and predator control.

Biosecurity of the farm

The bio-security was maintained as per in routine procedure to maintain the farm to reduce the incidence of diseases.

Animal health management

Supplement of good nutrition and feed was ensured here. The does and bucks are fed with Napier and/or German grass twice daily as per requirement. The feed was supplemented with commercial concentrate (crude protein content: 120g/kg DM and energy content: 10.4 MJ ME/kg DM) in the morning and again in the afternoon at the rate of 200gm/ buck and a concentrate mixture (45% wheat bran, 20% khesari bran. 20% Soyameal, 10% maize crushed, 2% protein concentrate, 1.5% salt, DCP 1.5% and 0.1% vitamin mineral premix) was provided twice daily in the morning and evening at the rate of 100gm/ doe. Clean and safe water was being made available at all times.

Herd health care

All does and bucks were vaccinated and deworming and dipping were also performed routinely in this farm. Regular vaccination schedule was maintained in this farm against Peste des Petits Ruminants (PPR). Vaccinations were performed that were not affected with diseases and pregnant.

Disease diagnosis

The farm was visited regularly and sick animal was identified through history and clinical examination. The history of the diseases including treatment and vaccination and clinical examination of affected animals were recorded on the basis of clinical signs such as weight loss, abortion, diarrhoea, hard udder, arthritis, pneumonia or neurological symptoms. To aid in diagnosis of different diseases blood examination, feces

examination and skin scraping were done. All protocol obtained from Coles EH (1986).

RESULTS AND DISCUSSION

Overall incidence of diseases

The identified diseases and incidence rate have been shown in Table 1. From the data, it appeared that highest incidence rate (%) of diseases was diarrhoea (17.4) followed by fever (16.5) pneumonia (13.8), bloat (10.6), contagious ecthyma (8.3), mixed parasitic infestation (6.9), Fascioliasis(6.0), Paramphistomiasis (4.6), corneal opacity (3.2), anuria (3.7), mange (2.3), caprine arthritis encephalitis(1.8), abscess (1.4), abortion (1.4), anoestrus (1.17), and retention of placenta (1.0).

Table 1
Overall incidence of diseases of goats in nucleus breeding flock.

List of diseases	Number of affected goats	Total Incidence (%)
Diarrhoea	38	17.4
tympani/Bloat	23	10.6
Pneumonia	30	13.8
Corneal opacity	7	3.2
Anuria	8	3.7
Mange	5	2.3
Abscess	3	1.4
Abortion	3	1.4
Retention of placenta	2	1.0
Anoestrus	3	1.4
Contagious Ecthyma	18	8.3
CAE	4	1.8
Mixed parasitic infestation	15	6.9
Fascioliasis	13	6
Paramphistomiasis	10	4.6
Fever and anorexia	36	16.5
Total	218	

Overall incidence of diseases was highest in group-3 (39.45%) than in group-2 (31.64%) and in group-1 (28.9%) respectively. The result is not similar to previous study. These groups (Group-1 and Group-2) of animals are purchased from farmer level (where they have lack of knowledge for preventive health care). This group of animals

may act as carrier of many diseases and it might be the causes of higher incidence of diseases whereas it was found that in Group-1 (own flock), by practicing management and preventive (vaccine) intervention, the incidence of diseases have decreased.

Incidence of disease based on sex and age of goats

Overall incidence of diseases was highest (40.0%) in group-3 than group-2(31.7%) and group-1(28.4%), respectively (Table-2 and Graph-1) where Group-3 was larger population than other groups. Overall incidence of diseases was highest in female (59.1%) than male groups (40.8%). Anorexia and fever ranked the highest portion among the infectious causes in all groups of goats. Female were highly susceptible to different diseases than male animals. In group-2, bloat was observed highest rate 16.0% but very low in group-1 (4.8%).Incidence of contagious ecthyma was found 14.5% in group-1 but in the group-2 and group-3 were 5.8% and 5.7% respectively. Incidence of fascioliasis was the highest (10.1%) in group-2 than group-3(5.7%) and group-1 (1.6%). Pneumonia was highest in group-1(22.6%) followed by in group-3 (11.5%) and group-2(8.7%). Animals < 6 months had high incidence of mange (skin disease) 6.5% than that of group-2 and no incidence were recorded in group-3 but incidence of alopecia was highest in group-2.

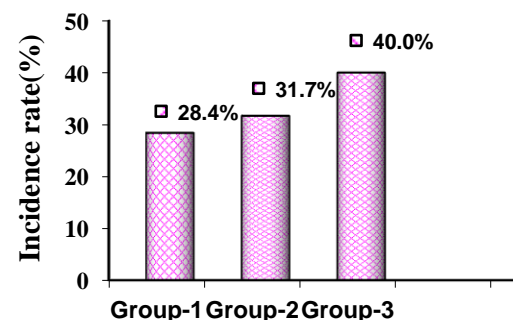


Figure 1
Age wise incidence of diseases in male and female.

Table 2
Incidence of diseases based on sex and age of goats.

Diseases	Group-1 (0- 6 months)		Group-2 (6 -12 months)		Group-3 (> 1 year)		Overall incidence in sex groups			
	Total	Incidence rate (%)	Total	Incidence rate (%)	Total	Incidence rate (%)	M	Incidence rate (%)	F	Incidence rate (%)
Fever and anorexia	11	17.7	15	21.7	10	11.5	15	16.9	21	16.3
Tympani/Bloat	3	4.8	11	16.0	9	10.34	9	10.1	14	10.9
Diarrhoea	9	14.5	12	17.4	17	19.5	14	15.7	24	18.6
Pneumonia	14	22.6	6	8.7	10	11.5	11	12.4	19	14.7
Corneal opacity	2	3.2	1	1.4	4	4.6	2	2.2	5	3.9
Anuria	5	8.1	2	2.9	1	1.1	8	9	0	0
Scabies	4	6.5	1	1.4	0	0	3	3.4	2	1.6
Abscess	0	0	1	1.4	2	2.3	3	3.4	0	0
Abortion	0	0	0	0	3	3.4	0	0	3	2.3
Retention of placenta	0	0	0	0	2	2.3	0	0	2	1.6
Anoestrus	0	0	0	0	3	3.4	0	0	3	2.3
Contagious Ecthyma	9	14.5	4	5.8	5	5.7	8	9	10	7.8
CAE	3	4.8	0	0	1	1.1	2	2.2	2	1.6
Mixed Parasitic Infection	1	1.6	6	8.7	8	9.2	5	5.6	10	7.8
Fascioliasis	1	1.6	7	10.1	5	5.7	5	5.6	8	6.2
Paramphistomiasis	0	0	3	4.3	7	8	4	4.5	6	4.7
Total	62	28.4	69	31.7	87	40.0	89	40.8	129	59.1

Total goat of different sex and ages=114; Group-1=32, Group-2=37, Group-3= 45

Overall incidence of goat diseases based on season

The incidences of diseases were highest (49.6%) in rainy season (season-2) than in winter season (season-3) (30.8%) and dry period (19.6%) season-1 (Table 3). In season-1, the incidence of diarrhoea, fever and anorexia, bloat and contagious ecthyma were 28.6%, 25.0%, 21.4% and 18.0% respectively, whereas diarrhoea (22.5%), fever and anorexia (19.71%) and

parasitic infestation was found major problems in that farm. Pneumonia (11.7%), fever, anorexia (34.1%) and diarrhoea (27.3%) were mostly found in season-3. The incidence of diarrhoea was major threat for all seasons. Contagious ecthyma was the highest incidence in season-1 than the others seasons. Most of parasitic infestation was observed at rainy season.

Table 3
Overall disease incidence of goats in season wise categories.

List of diseases	Season -1 (march-June) Summer/dry season		Season-2 (July- October) Rainy season		Season-3 (November- February) Winter season	
	Number of affected animals	Incidence rate (%)	Number of affected animals	Incidence rate (%)	Number of affected animals	Incidence rate (%)
Fever and anorexia	7	25.0	14	19.7	15	34.1
Tympani/ Bloat	6	21.4	10	14.1	7	16.0
Diarrhoea	8	28.6	16	22.5	12	27.3
Pneumonia	3	10.7	9	12.7	18	41.0
Corneal opacity	2	7.1	3	4.2	2	4.5
Anuria	2	7.1	2	2.8	1	2.3
Mange	1	3.6	4	5.6	0	0
Contagious Ecthyma	5	18.0	9	12.7	4	9.1
CAE	1	3.6	3	4.2	0	0
Mixed Parasitic Infection	3	10.7	9	12.7	3	6.8
Fascioliasis	2	7.1	8	11.3	3	6.8
Stomach worm	1	3.6	8	11.3	1	2.3
Total	28	19.6	71	49.6	44	30.8

In this study various incidences of parasitic infestations such as paramphistomiasis (5.85%), fascioliasis (5.07%), and mixed parasitic infestation (*Stomach worm, Trichuris, Hydatid diseases*) about (3.95%) which was confirmed by fecal examination. Datta et al. (2004) reported highest (75.5%) prevalent of *Strongyles* followed by *Paramphistomum* spp. (44.6%) *Fasciola gigantica* (12.4%) and *Toxocara vitulorum* (2.6%) in Bangladesh. This highest incidence may be due to lack of pasture management as faeces of different ages of goat were used as manure and goats were fed this contaminated grass which may be a cause of parasitic infestation even after regular deworming.

The present finding on incidence of fascioliasis in goats substantiates the previous reports. The incidence of fascioliasis was more common in older animals than in young ones and insignificant difference was observed in *Fasciola* infestation between male and female animals. Similar results were observed by Eisa et al., (2011).

In this study the incidence of paramphistomiasis was about 5.85% whereas Uddin (1999) stated that

the prevalence of infection with amphistomes in black Bengal goat in Mymensingh area was 72.9%.

Diarrhoea was identified as another important fatal disorder in (14.06%) goats. Mixed infections due to microbial and parasitic causes of diarrhoeal syndrome are now more common than single infections (Blood et al. 1983; Braun et al. 2000; Soundararajan et al 2006; Haque et al. 2007). Diarrhoeic syndrome was found due to enterotoxaemia and colibacillosis about 1.56% and 2.34%, respectively. Haque et al. (2007) isolated and indentified the etiologic agents of diarrhoea in goats and found *Salmonella* sp. (5.0%), *Staphylococcus* sp. (10.0%), *Escherichia coli* (25.0%), *Bacillus* sp. (85.0%) and *Clostridium* sp. (65.0%) as single or mixed infection. Enterotoxaemia which is caused by *Clostridium perfringens* type-1 was observed in 6 goats and total incidence was 2.34% in all age groups. Characteristic signs revealed good body condition with severe diarrhoea.

The present investigation found that among viral diseases incidence of contagious ecthyma was

7.03% which was mostly found in young age. No death was recorded due to contagious ecthyma. This finding was similar to previous study of Ashok-Kumar et al. 2004 and Abeledo et al. 2002. Caprine arthritis-encephalitis (CAE) is one of the major infectious diseases occurring in goat breeding farm (Konishi et al., 2004 and Silva et al., 2005) whereas the present investigation identified a suspected case which was not confirmed. Clinical sign revealed pronounced lameness where animals were unable to extend the limbs and may walk on their knees whereas Konishi et al. (2004) reported arthritis of the carpal joints and occasionally by pneumonia was observed among goats.

Acidosis or bloat was found as one of the most important digestive disorders in goats. The intoxication of large amounts of highly fermentable carbohydrate diet feed causes this disease due to excessive production of lactic acid in the rumen (Blood et al., 1983).

Anuria, either complete or partial could be developed due to renal insufficiency and failure. There are varieties of causes for such disorder. Injury in penis and urethral obstruction by calculi is one of the most common causes of Anuria. There are many reports of such complications in farm as well as pet animals (Mia 1967; Brown et al. 1977; Bohonwych et al., 1978; Sato and Omori 1979; Matthews, 2006; Vathsala, M. 2006). However, all the goats were kept on enriched diet and special care for fattening. But this study failed to detect the presences of calculus. The relationship between nutritional factors and urolithiasis has been a subject for investigation for many year. it has been found that food that are either high in phosphate and magnesium low in calcium and chloride are be potentially calculus provoking (Lewis et al. 1978). Therefore, in order to prevent urolithiasis in fattening goats they should be allowed for free grazing because the incidence of such disorder is reported to be low in goats which are allowed to receive adequate amount of carotene (Schmidt, 1941). Furthermore, the concentrate feeding should be supplemented with sodium chloride because salt has inhibitory effect in prevention of calculus formation (Udall et al., 1965; Dewan and Das, 1988).

Anemia or debility was found in sixteen goats (6.25%) with a characteristic signs of malnutrition and cachexia. In this study anemia was found mostly due to parasitic infestation (stomach worm and fascioliasis). The rate of incidence of reproductive disorder and abscess, corneal opacity, mastitis observed in this study was in conformity with the studies of Kaba et al., (2004), Matthews (1999) and Pinheiro et al., (2000).

The present study was conducted in a relatively biosecured farm. The incidence of diseases in this farm was higher than other studied as these animals were purchased from farmer level (where they have lack of knowledge for preventive health care).. However, the incidence of the diseases in goat of this farm could be reduced to a substantial rate by improving the management system currently practicing in the farm.

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