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## RETROSPECTIVE STUDY OF FOOT AND MOUTH DISEASE IN CATTLE AT BABUGONJ UPAZILA OF BARISAL DISTRICT

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### ABSTRACT

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The present study was conducted in Babuganj Upazila Veterinary Hospital, Barisal during the period from September 2015 to August 2017 to observe the prevalence of Foot and Mouth Disease (FMD). A total of 727 animals were examined during this period and 158 cases were found positive to FMD, so the proportionate prevalence of FMD was 21.73% (n=158) at Babuganj Upazila. The effect of age, sex, breed and season on the prevalence of the disease was discussed. The proportionate prevalence of FMD was highest in the month of December and January. The males (432 males, 109 affected, prevalence 25.23%) were more susceptible than females (295 female, 49 affected, prevalence 16.61%). The Older cattle (more than 4 years old) were more susceptible to FMD (29.88%) compared to adult (2 to 4 years; 19.53%) and younger (less than 2 years old; 8.62%). Moreover, FMD is more frequent among indigenous breeds (27.90%) than crossed breeds (13.91%). The findings from this study can be used as baseline epidemiological data for further research to understand the epidemiology of FMD in Barisal.

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## INTRODUCTION

Bangladesh is one of the most densely populated countries in the South Asia of the world. Livestock is an important sub-sector in this country, considered to be the backbone of agriculture. There are about 25.7 million cattle present in Bangladesh (DLS, 2015). About 20% of the human population is directly and 50% is partly dependent on the livestock sector (Bangladesh Economic Review, 2009). Livestock is one of the most important components for rural agricultural farming system in Bangladesh and it has been playing an important role in economy by providing food, draft power, transport, hides, bone, biogas etc. Although cattle are performing a vital role, maximum of them are moderate to very thin condition and frequently affected with several types of diseases due to poor management practices and geo-climatic condition of Bangladesh. Diseases are one of the most important limiting factors that cause significant mortality of adult cattle and neonatal calves each year (Debnath et al., 1990). It was reported that variation in different cattle breed, their sex, season and environmental factors greatly influence the disease prevalence in cattle (Alim et al., 2011; Sarker et al., 2011; Juli et al., 2015).

Among infectious disease in Bangladesh, FMD is an endemic disease which is found round the year, although highest incidence occurs mainly at the end of rainy season (Rahman et al., 1985). The main impacts of FMD in terms of animal production are the following: reduced milk yields and increased probability of mastitis due to damaged teats in dairy animals, abortions and delayed conception in breeding stock, perinatal mortality, as a direct result of the disease in young animals, and aggravated by reduced milk production and unwillingness to allow suckling in the dam, lameness in draught animals, which reduces their ability to work in terms of cultivation and transporting goods and loss of weight in growing animals due to reduced feed intake resulting from foot and mouth lesions (Davies G. 1988).

Foot and Mouth Disease (FMD) is an important viral disease of various cloven-footed animals. Seven immunologically distinct serotypes are recognized- A, O, C, Asia-1 and South African Territories (SAT-1, SAT-2 and SAT-3). In Bangladesh types A, O, C, Asia-1 and subtypes A-5 and A-22 are prevalent (Khan et al., 2002). FMD appears in cattle of Bangladesh either generally in endemic or sometimes in epidemic form. Amongst the livestock diseases FMD is thought to be the most dreadful one owing to its fierce pathogenicity and complexity in controlling it. Once the outbreak starts, it continues round the year affecting large number of cattle herd. The incidence of the disease was recorded highest in 1990. Out of 64 districts FMD epidemic was broken out in 55. During that period the economic loss was disastrous due to all out production loss of cattle by the outbreak of FMD (Alim et al., 2011). An average of 130 incidents (outbreak) of FMD every year has been reported from Bangladesh (Domingo et al., 2002).

FMD does not cause high mortality in adult animals; the disease has debilitating effect on animal health which includes reduced milk production, loss of draft power, decrease in body weight and reproductive failure. FMD virus causes myocardial degeneration in young animals, known as Tiger Heart Disease which causes mortality (Gleeson et al., 2003). About 17% of the cattle are affected in Eastern and Southern Asia. Studies conducted by Bangladesh Livestock Research Institute (BLRI) revealed that the morbidity in cattle to be around 36%, in buffaloes 23% and in goats/sheep 5%. Mortality rate, especially in calves, has been found to be about 51% in outbreak areas (BLRI, Ministry of Fisheries & Livestock, 2006). Howlader et al., (2004) estimated an economic loss of taka 4168.4 thousand for 4750 FMD affected cattle and recorded 61.2% prevalence in cattle and 19.5% calf mortality due to this disease in Bangladesh. The occurrence of the disease in draft cattle during land preparation has been contributing to a lot of sufferings of the farmers that lower crop production in locality due to loss of drafting power. However, the present study was conducted to determine the occurrence and potential risk factors associated with FMD in Cattle at Babujanj Upazila Veterinary Hospital, Barisal.

## MATERIALS AND METHODS

### Study area and period

The study was conducted in Babuganj Upazila Veterinary Hospital, Barisal, during the period from September 2015 to August 2017.

### Data collection

All the sick animals brought for treatment to the Veterinary Hospital were first registered in the patient registered book. The description of each registered animal and owner's complaint were recorded. A total of 727 patients were available during the two year period and the general clinical examinations were conducted on the basis of disease history and owners complaint. The clinical signs were observed in each affected animal. The diagnosis of FMD based on clinical signs like lameness, reduced milk production, salivation, vesicles on the feet sometimes in nostrils, lesion around the oral cavity and on the mammary glands. Proprtinate prevalene was calculated by dividing the number FMD cases with the total number of cases attended during the study period.

### Data analysis

Descriptive analysis was conducted in Excel (Microsoft® Office Excel 2007) and statistical tests were undertaken in SPSS 18.0 for Windows (SPSS Inc., Chicago, IL, USA) to observe the significant influence of different months, sex, age and breeds on the disease (Coakes et al., 2006).

## RESULTS AND DISCUSSIONS

A total of 727 animals were examined and 158 cases were found positive to FMD. So the overall proportiante prevalence of 21.73% (n = 158) reported in this study which is very similar to the findings in South Asia (Melo et al., 2003) where the prevalence was 22.89%. Conversely, the finding of this study was slightly lower than the prevalence of 24.51% was reported in Mannan et al., (2009), 25.07% in Rajshahi (Sarker et al., 2011), 23.88% in Matiranga, Khagrachhari (Real et al., 2015).

### Feet lesions (Vesicles/blisters)

The vesicles in the interdigital space are usually large due to stress on the epithelium caused by movement and weight. The lesion at the coronary band at first appears blanched then there is separation of the skin and horn (Figure 1). When healing occurs, new horn is formed, but a line resulting from the coronitis is seen on the wall of the hoof.



Figure 1. Ruptured vesicles in the interdigital cleft of a steer.

### Clinical cases of FMD in different age groups of cattle

The distribution of FMD in different age groups of cattle is presented in table 1. The older cattle (more than 4 years old) were more susceptible to FMD (29.88%) compared to adult (2 to 4 years; 19.53%) and younger (less than 2 years old; 8.62%). The age-specific clinical cases study revealed increasing cases as the age increases, which is in agreement with the report of (Gelaye et al., 2009; Sorwar et al., 2016 and Real et al., 2015). This may be attributable to the young cattle being herded in homestead areas and hence having less chance of exposure. Those animals aged >4 years may have acquired the infection from multiple serotypes and/or infections.

**Table 1.** Age-wise distribution of FMD cases attended at Babuganj Veterinary Hospital during September 2015 to August 2017

Age	Animals Examined	Clinical Cases	Prevalence (%)
Young (< 2 Years)	174	15	8.62
Adult (2 to 4 years)	215	42	19.53
Old (> 4 years)	338	101	29.88
Total	727	158	21.73

### Gender-wise distribution of FMD cases

Table 2 shows the distribution of FMD in male and female cattle. The association between sexes with prevalence of FMD cattle was also observed whereby male cattle showed the highest prevalence (25.23%) than female (16.61%). This finding is in agreement with the reports of other authors (Remond *et al.*, 2002; Rahman *et al.*, 2012; Real et al., 2015).

**Table 2.** Sex-wise distribution of FMD cases attended at Babuganj Veterinary Hospital during September 2015 to August 2017.

Sex	Animals Examined	Clinical Cases	Prevalence (%)
Male	432	109	25.23
Female	295	49	16.61
Total	727	158	21.73

### Breed-wise distribution of FMD cases

The breed-wise distribution of FMD cases is shown in Table 3. The breed specific prevalence depicts that the FMD affects mostly indigenous cattle which is in agreement with the report of other authors (Samuel and Knowles, 2001; Real et al., 2015). The higher incidence of the disease in indigenous cattle compared to cross breeds might be due to the suboptimum management practices implemented on indigenous cattle as they were supplemented with minimum inputs due to their low production and body weight gain. Indigenous cattle are usually let to graze at the periphery of the center; therefore, the higher level of incidence might be due to higher frequency of contact with infected animals of the nearby farmers which increase the degree of acquiring FMD (James and Rushton, 2002 and Rahman et al., 2012).

**Table 3.** Breed-wise distribution of FMD cases attended at Babuganj Veterinary Hospital during September 2015 to August 2017

Breed Name	Animals examined	Clinical Cases	Prevalence (%)
Indigenous	418	117	27.90%
Cross	309	41	13.91%
Total	727	158	21.73%

### Month and season-wise distribution of FMD cases

The association between seasons with prevalence of foot and mouth disease in cattle was also observed whereby showed the highest prevalence in the month of December-January and then declined in the month of February and March is presented in Figure 2. This finding is in agreement with the report of (Mannan et al., 2009). Other authors also reported higher prevalence in winter season (Sarah et al., 2002; Rahman et al., 2012)

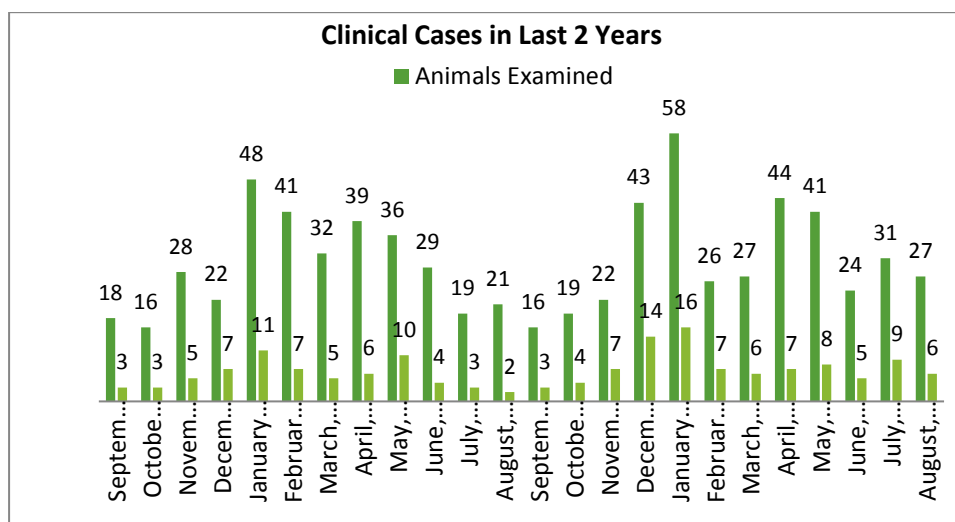


Figure 2. FMD cases in different months

## CONCLUSION

Indigenous breed, male cattle, and cattle older than 4 years should get priority for vaccination. Vaccination should be started at least once in November as the prevalence is higher in December and January.

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