

## **Prevalence of lameness in cattle in selected areas of Bangladesh**

**ML Ali, M Hasan, MAH Miah, SM Hanif, NS Juyena and MA Hashim\***

Department of Surgery and Obstetrics, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

### **Abstract**

Prevalence of lameness was investigated in 1000 randomly selected cattle in Veterinary Teaching Hospital, Bangladesh Agricultural University (BAU) and different dairy farms in Boira Union, Mymensingh during January to December 2015. The aetiology, age [1 year, 1 - 3 years, 3 - 5 years and >5 years], sex (male, female), different stages of cattle [Calves, Heifers, Pregnant cows, Lactating cows, Dry cows, and Bulls] and floor type (concrete, muddy floor, pavement, straw yard) were studied. Out of 1000 cattle examined, 111 (11.1%) showed lameness in different grades, with 82.0% slightly, 14.4% moderately and 3.6% severely lame. The aetiologies of lameness are upward fixation of patella, traumatic injury, foot and mouth disease (FMD) complications, arthritis, interdigital hyperplasia, interdigital dermatitis and interdigital necrobacillosis. Higher percentages of lameness were in hind limbs than fore limbs. Left hind limbs were more frequently affected than right hind limbs. Animals over 5 years of age were most vulnerable to lameness. Female especially high yielding cows were at higher risk (69.4%) than the male cattle (30.6%). Prevalence of lameness was higher when cattle were confined to the concrete floor than the muddy floor. Pregnant cows were the most vulnerable to lameness. It is suggested that aetiology, age, sex, different stages of cattle and floor type could be considered as risk factors causing lameness in cattle. (*Bangl. vet.* 2017. Vol. 34, No. 1, 1 – 8)

### **Introduction**

Lameness is a painful condition and causes economic losses (Esslemont *et al.*, 1997) through early culling (Booth *et al.*, 2004) and reduced milk yield (Amory *et al.*, 2008). A variety of reasons for lameness have been reported, including heritable defects, congenital defects, developmental defects, growth abnormalities, trauma, infection, management and environmental factors (Greenough *et al.*, 1972), poor hygienic and nutritional practices (Blowey, 1993). Age, sex and breed of the animals also influence the type and cause of lameness. In dairy cattle, main cause of lameness is pain in the limb, especially in the foot; hind limbs are more affected than forelimbs (Blowey, 2005). Economic loss can result from reduced milk yield, weight loss, disposal, deaths and replacement cost, sub-fertility, prolonged calving interval, veterinary expenses and additional farmer's time (Weaver *et al.*, 2005). Lameness in dairy cattle causes crippling economic losses to the industry with up to 52% (average 20-25%) of dairy cows becoming lame each year (Clarkson *et al.*, 1996; Warnick *et al.*, 2001). Lameness is

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\*Corresponding author:- E-mail: mirza\_sarah1959@yahoo.com

caused by many diseases being the clinical manifestation of an animal attempt to relieve pain. Pain causes stress and, therefore, the attendant suffering is a highly important animal welfare issue (Whay *et al.*, 1998; 2003). Diagnosis of lameness is complex as it affects animal's ability to move and may be due to musculoskeletal, nervous and integumentary lesions independently or in combination. In spite of the serious apparent impact of lameness on the performance of cattle, there has been little work done in Bangladesh. The extent of lameness in organized farms requires extensive study to identify the problems, so that appropriate preventive measures can be taken. With this goal in view, the present study was conducted to determine the prevalence of lameness in cattle dairy farms.

## **Materials and Methods**

### *Experimental animals*

This study was conducted in 1000 randomly selected cattle in the Bangladesh Agricultural University (BAU) Dairy Farm, Veterinary Teaching Hospital, BAU and different dairy farms in Boira Union, Mymensingh during January to December 2015. The parameters studied were aetiology, age [Calf  $\leq$  1 year (n = 23), 1 - 3 years (n = 24), 3 - 5 years (n = 31) and  $>$ 5 years (n = 33)], sex [male (n = 34) and female (n = 77)], different stages of cattle [Calves (n = 23), Heifers (n = 20), Pregnant cows (n = 15), Lactating cows (n = 35), Dry cows (n = 10), and Bulls (n = 8)] and floor type [concrete, muddy floor, pavement and straw yard]. Here 'n' denotes number of cattle with lameness in respective groups.

### *Management*

#### *Feeding and housing*

The animals were allowed to graze for 2 hours daily. They were also supplied with fodder and concentrates. All animals had access to adequate amount of water. They mostly ate straw, green grass, silage, wheat bran and oil cake. Concentrates were provided twice a day. Dairy cow were reared in indoor farming system and allowed exercise for optimum time. Feeding and milking was carried out in the same barn. The barn was completely roofed well ventilated. The floor was non-slippery, hard and impervious, which were either brick-on-edge or concrete. A reinforced cement concrete trough was provided for watering the animals. Maternity pens were provided for cow nearing parturition. Adequate lighting arrangement was provided. A manger and water trough of proper size was constructed for each pen. Ambient temperature was required for calf rearing. The shed was adequately lighted. The calves were supplied with forage, concentrates and minerals and had access to sufficient water.

### *Data collection*

The following steps were performed for data collection

- i. Collection of relevant epidemiological data. For each animal age, sex, breed,

feeding 30- = 099; habit, housing system, floor condition, affected site and season were recorded.

- ii. Determination of the sensitivity to hoof testers.
- iii. Recording of all limbs with claw and foot lesions according to scoring system.

### ***Diagnosis of lameness***

The limbs were examined by inspection, palpation and percussion to diagnose upward patellar fixation, traumatic injury, foot and mouth disease (FMD) complications, arthritis, interdigital hyperplasia, interdigital dermatitis and interdigital necrobacillosis.

### ***Detection and scoring of lameness***

Subjective methods of lameness detection include locomotion scoring systems, which require observation of gait characteristics as cows are walking as described by Flower and Weary (2009).

Scoring of lameness was made following the method (Manson and Leaver, 1988) as follow:

Score 0: No lameness, normal gait and behaviour

Score 1: Slight lameness, uneven gait or appear tender, possibly with downward extension of head and neck

Score 2: Moderate lameness, difficulty in turning and walking

Score 3: Severe lameness, difficulty in turning, affecting rising and normal behaviour, mostly lying down.

### ***Statistical analysis***

Descriptive analyses were done using IBM Statistical Package for Social Sciences (SPSS) version 20.0.

## **Results and Discussion**

Out of 1000 cattle examined, 111 (11.1%) showed lameness in different grades, with 82.0% slightly, 14.4% moderately and 3.6% severely lame. This is similar to the results of Uddin *et al.* (1997) who reported that the prevalence of lameness is 11.5% in 2433 cows.

### ***Prevalence of lameness on the basis of aetiology***

The aetiology of lameness observed in this study were upward patellar fixation (UPF), traumatic injury, foot and mouth disease complications, arthritis, interdigital hyperplasia, interdigital dermatitis and interdigital necrobacillosis. The prevalence of UPF was 2.1%, which was similar to the results of Sarkar (2012). They showed 1.7%, followed by Singh *et al.* (2015) in winter season it is 47.8%, but in rainy season it is

34.8% and least in summer season (17.4%). UPF was higher in left hind limb than in the right hind limb, which is similar to the results of Das (2004). The study revealed that the UPF exists throughout the year but the signs are exaggerated in winter and in draught animals.

The prevalence of foot and mouth disease (FMD) complications was 1.8%. Das (2004) reported that the percentage of the FMD complications was 9.6%.

The prevalence of arthritis was 1.8%, which was remarkably lower (29.0%) than in a study reported by Uddin *et al.* (1997).

The prevalence of traumatic injury (1.8%) was lower than as reported by Das (2004) who reported plough injury of about 2.7%.

The prevalence of interdigital hyperplasia was 1.5%, which is remarkably lower than the results of Talukdar (2004). Talukdar showed interdigital hyperplasia in cattle was 18.5%. But Clarkson (1994) showed interdigital hyperplasia in cattle was 6.7%.

The prevalence of interdigital dermatitis was 1.0%, which was similar to the results of Talukdar (2004) and it was higher than a study reported by Zerlli *et al.* (1994).

The prevalence of interdigital necrobacillosis was 1.1%, which was similar to the results reported by Collick *et al.* (1989). They showed that interdigital necrobacillosis in cattle is 2.2%. But, this study showed lower than in a similar study reported by Zerlli *et al.* (1994) where it was 13.7%.

Table 1: Prevalence of lameness on the basis of aetiology in studied cattle population

Aetiology	Right forelimb	Left forelimb	Right hind limb	Left hind limb	Total	Prevalence
Upward patellar fixation	-	-	9	12	21	2.1
Traumatic injury	3	6	3	6	18	1.8
Foot and mouth disease complications	3	-	3	12	18	1.8
Arthritis	-	3	6	9	18	1.8
Interdigital hyperplasia	6	-	6	3	15	1.5
Interdigital dermatitis	4	-	6	-	10	1.0
Interdigital necrobacillosis	4	4	-	3	11	1.1
Total	20	13	33	45	111	11.1

#### *Prevalence of lameness with respect to age in cattle*

The highest prevalence of lameness was in animals of above 5 years (13.3%), followed by those between 3 - 5 years (10.9%), 1 - 3 years (10.3%) and <1 year (9.6%) (Table 2). This result is in conformity with the results Mohsina *et al.* (2014).

Table 2: Prevalence of lameness with respect to age in studied cattle population

Age of cattle	Number of cattle examined	Number of cattle with lameness	Prevalence
<1 year	240	23	9.6
1-3 years	185	19	10.3
3-5 years	302	33	10.9
>5 years	273	36	13.2

#### *Prevalence of lameness on the basis of sex*

Female especially high yielding cows were more affected (69.4%) than male cattle (30.6%), because of the heavy weight bearing during pregnancy, heavy udder, and nutrition supplemented food supplied during the pregnancy and after parturition. Das (2004) reported incidence of lameness in female cattle (10.6%).

#### *Prevalence of lameness on the basis of floor type*

The prevalence of lameness was higher in cattle confined to concrete floors (18%) than on cattle on muddy floor (15.6%), pavement (10.8%) and straw yard (10%). Uddin *et al.* (1997) reported the prevalence of more lameness in concrete-floored houses is 15%. It was found that most lameness occurred on concrete floor due to concussion and unhygienic environment.

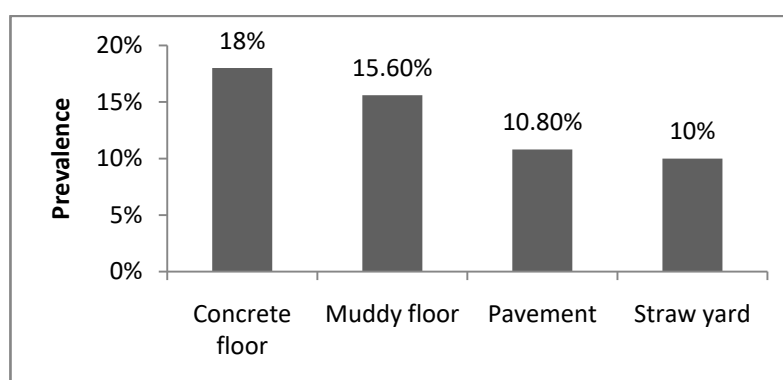


Fig. 1. Graph showing the prevalence of lameness on the basis of floor type in studied cattle population

#### *Prevalence of lameness in different stages of cattle*

Pregnant cows were most vulnerable to lameness (16.3%). Choquette-Levy (1985) reported higher incidence (24.6%) of lameness in pregnant cows. In cows having an improper hoof shape with metabolic imbalance, the onset of lameness accelerates (Enevoldsen *et al.*, 1991). Increased body weight and impairment of metabolism during pregnancy may be related to increased incidence of lameness.

Lactating cows showed the second highest prevalence (11.5%) of lameness, which are supported by Greenough (2007). Eddy *et al.* (1980) surveyed two-thirds of the cases

that occurred within the first three month of lactation. The overall lameness ranged from 5.4% to 46.2% (Endres, 2006). Risk factors associated to lameness can be attributed to poor cow comfort, non-yielding walking surface, slippery floors, sloped walkways, harsh movement of cows and long standing times.

Calves in the present study sustained lowest prevalence (9.6%) of lameness among all categories of cattle that is supported by Eddy *et al.* (1980). This may be due to the fact that they are less exposed to adverse condition and that their hooves were contacted with the floor for shorter period of time.

The prevalence of lameness in bull was 9.8%. Alien (1990) reported incidence of lameness in bulls of about 16.9%. Increased occurrence of lameness in bulls may be due to their increased body weight, feed, lack of exercise and genetics.

Table 3: Prevalence of lameness in different stages of studied cattle population

Stages of cattle	Number of cattle examined	Number of cattle with lameness	Prevalence
Calves	240	23	9.6
Heifers	185	20	10.8
Pregnant cows	92	15	16.3
Lactating cows	305	35	11.5
Dry cows	96	10	10.4
Bulls	82	8	9.8

## Conclusions

From the present study, it can be concluded that UPF, traumatic injury, FMD and arthritis are the major aetiology of lameness in cattle. Hind limbs were more frequently affected than the forelimbs. Pregnant cows over 5 years of age and concrete floor-type housing are the risk factors for lameness in cattle.

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