

## CLAW AFFECTIONS OF DAIRY COWS IN AN ORGANIZED DAIRY FARM

M. M. A. A. Talukdar<sup>1</sup>, M. M. Alam, Y. Mohammed and M. A. Hossain

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

### ABSTRACT

The experiment was conducted at Bangladesh Agricultural University, Mymensingh dairy farm to study the incidence of claw affections in dairy cow during the period from January to April 2004. A total of 142 cattle were investigated. These animals were studied under 5 groups: Group I (n = 46), age <1 year; Group II (n = 44), age <3 years; Group III (n = 15), age >3 years; Group IV (n = 31), age <4 years and Group V (n = 6), age >5 years. Out of 142 cattle, 27 animals were found to be affected with various claw lesions, the incidence being 19.01%. Hindlimbs are more frequently subjected to claw affections than the forelimbs. Hoof overgrowth and sole ulcer were the most predominant claw affections (22.22% each) followed by interdigital hyperplasia (18.52%), sand crack (18.52%), interdigital dermatitis (7.41%), heel erosion (7.41%) and white line disease (3.70%). Lactating cows of over 4 years were more vulnerable to claw affections as compared to pregnant and dry cows. Calves and heifers had low incidence of claw affections.

**Key words:** Claw affections, dairy cow, organized dairy farm

### INTRODUCTION

Lameness in cattle is a relatively neglected area in veterinary science. The problems in cows may affect the production performances. Three major diseases affecting the dairy industries in western countries are mastitis, infertility and lameness. Lameness itself has been reported to affect 25% of the British dairy herds every year (Scott, 1988). The cause of lameness may be hereditary, nutritional deficiency, infectious diseases and environmental factors (Greenough, 1972). Lameness mostly occurs as a result of foot problems which may be due to both managerial and environmental errors. These are poor hygienic practices, inappropriate housing, uneven or slippery floor, rough tracks, genetic selectivity, nutritional factors, lack of foot bathing and poor foot care (Blowey, 1993). Lameness caused a serious loss to the dairy industry (Whitaker *et al.*, 1983). Most lameness causing lesions in dairy cattle originate in the claw (Murray *et al.*, 1996). Seasons may have an influence on the general health status of cattle. Dry atmosphere dries and hardens the horny tissue of the hoof, which may increase the resistance to accidental trauma. Research work on claw affections is still limited in our country. Das *et al.* (2004), however, did some comprehensive work on bovine claw affections. His study dealt with the cows of some mini dairy farms of greater Mymensingh district as well as rural areas of this region. The status of claw affections in the organized farm is not available. The present research work was carried out to study claw affections in an organized farm with the following objectives: a) to determine the prevalence of various claw affections in cattle, b) to study the effect of age on the occurrence of claw affections and c) to identify the claws that are vulnerable to various affections.

### MATERIALS AND METHODS

The study was conducted at Bangladesh Agricultural University (BAU) Dairy Farm from January to April 2004. The categories of cattle used are shown in Table 1.

Table 1. Category of cattle examined at BAU dairy farm

Category	Age group	No. of cattle
Calves	<1 year	46
Heifers	<3 years	44
Pregnant cows	>3 years	15
Lactating cows	>4 years	31
Dry cows	>5 years	06

## Clinical examination

### Inspection

The movement and normal posture of the cattle were observed to identify the gross affection in the claw and lameness. In presence of lameness, the claws were meticulously examined.

### Lameness scoring (0-3)

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.

Affections found in different limbs of the same cattle were recorded and these were taken as a single case.

### Palpation and percussion of the claw

After proper controlling (standing/casting position) of the cattle these two methods were applied. Palpation and percussion were performed to find out the painful condition of the affected area of the claw. Sensitivity was determined by using hoof tester.

### Exploration with needle

If the affected area was swollen, then the needle exploration was performed for the diagnosis of the disease.

### Close observation of the hoof

Hoofs were closely observed for any abnormalities or presence of foreign bodies.

### Manual manipulation

Manual manipulation was done for the diagnosis of any painful condition such as trauma.

## RESULTS AND DISCUSSION

### Incidence of claw affections

The incidence of claw affections among the affected cattle in different groups is shown in Table 2. Hoof overgrowth and sole ulcer were the most frequent affections (22.2%), whereas the least frequent affection was white line disease (3.7%). Other affections were interdigital dermatitis (7.4%), interdigital hyperplasia (18.5%), sand crack (18.5%) and heel erosion (7.4%). In this study, sand crack exhibited the most frequent affection in claws (7.4%) and this was followed by hoof overgrowth (3.7%). In heifers, sole ulcer had the highest rank (7.4%). In this group, incidence of hoof overgrowth and interdigital hyperplasia was 3.7% in each case. Hoof overgrowth and heel erosion were predominantly found in pregnant cows (7.4%) and this was followed by interdigital hyperplasia (3.7%). In lactating cows, the incidence of hoof overgrowth, interdigital dermatitis, interdigital hyperplasia, sand crack and sole ulcer were 3.7, 7.4, 11.11, 3.7 and 7.4% respectively. In dry cows the recorded claw affections were hoof overgrowth (3.7%), sand crack (7.4%) and sole ulcer (7.4%).

Table 2. Occurrence of various claw affections in the affected cattle (n = 27)

Claw affections	Type of cattle affected with relative incidence					No. of affected cattle	Overall incidence
	Calf	Heifer	Pregnant	Lactating	Dry cow		
Hoof overgrowth	1 (3.7%)	1 (3.7%)	2 (7.4%)	1 (3.7%)	1 (3.7%)	6	22.22%
Interdigital dermatitis	–	–	–	2 (7.4%)	–	2	7.41%
Interdigital hyperplasia	–	1 (3.7%)	1 (3.7%)	3 (11.11%)	–	5	18.52%
Sand crack	2 (7.4%)	–	–	1 (3.7%)	2 (7.4%)	5	18.52%
Sole ulcer	–	2 (7.4%)	–	2 (7.4%)	2 (7.4%)	6	22.22%
Heel erosion	–	–	2 (7.4%)	–	–	2	7.41%
White line disease	–	–	–	–	1	1	3.70%
Total						27	100%

Values within the parenthesis indicate occurrence.

**Influence of age on lameness**

Table 3 shows the incidence of claw affections as a result of senility. The highest incidence of claw affections was recorded in lactating cows (6.34%), followed by dry cows (4.22%), pregnant cows (3.52%) and heifers (2.82%). The lowest incidence (2.11%) was recorded in calves. Age adversely affected bovine claws.

Table 3. Influence of age on the incidence of bovine claw affections

Group	Type of animals	Ages	No. of animals examined	No. of claw affections	Incidence rate (%)
I	Calf	<1 year	46	3	2.11
II	Heifer	<3 years	44	4	2.82
III	Pregnant cow	>3 years	15	5	3.52
IV	Lactating cow	>4 years	31	9	6.34
V	Dry cow	>5 years	6	6	4.22
Total			142	27	19.01

Table 4 shows distribution of various claw affections in different limbs.

Table 4. Occurrence of various claw affections in bovine limbs

Affections	Left forelimb	Right forelimb	Left hindlimb	Right hindlimb	Total
Hoof overgrowth	3 (4.29%)	3 (4.29%)	6 (8.57%)	6 (8.57%)	18 (25.71%)
Interdigital dermatitis	1 (1.43%)	1 (1.43%)	2 (2.86%)	2 (2.86%)	06 (08.57%)
Interdigital hyperplasia	3 (4.29%)	3 (4.29%)	5 (7.14%)	5 (7.14%)	16 (22.86%)
Sand crack	3 (4.29%)	3 (4.29%)	2 (2.86%)	2 (2.86%)	10 (14.29%)
Sole ulcer	1 (1.43%)	1 (1.43%)	6 (8.57%)	6 (8.57%)	14 (20.00%)
Heel erosion	–	–	2 (2.86%)	2 (2.86%)	04 (05.71%)
White line disease	–	–	1 (1.43%)	1 (1.43%)	02 (02.86%)
Total	11 (15.71%)	11 (15.71%)	24 (34.29%)	24 (34.29%)	70 (100%)

Values within the parenthesis indicate occurrence.

**Hoof overgrowth**

Incidence of hoof overgrowth was found to be 22.22% (6/27) among various claw affections. In pregnant cows the incidence was higher. Glicken and Kendrick (1977) found that the hoof overgrowth in the cows were a wide spread problem due to genetic etiology but in this study it was found that overgrown hoof occurred due to higher body weight in the hind region during pregnancy stage.

**Sole ulcer**

In this study incidence of sole ulcer was 22.22% (6/27). Eddy and Scott (1980) reported a lower incidence of sole ulcer (13.9%). These affections are similarly distributed among heifer, lactating cow and dry cow. The higher of sole ulcer incidence in dry cows, may be due to increased age in these animals.

**Interdigital hyperplasia**

The presence of interdigital hyperplasia was 18.52%. Lactating cows of over four years were more prone to this affection (11.11%). A relatively lower incidence of interdigital hyperplasia (6.7%) has been reported by Clarkson (1994). Hindlimb was affected more (14.28%) than the forelimb (8.58%). This agrees with the earlier observation of Rehbur and Pearson (1982).

**Sand crack**

Incidence of sand crack was 18.52% in this study. Dry cows of over 5 years were more affected compared to other age groups. Goonewardene and Hand (1995) reported an incidence of 22.7% in pasture cows.

**Interdigital dermatitis**

The percentage of interdigital dermatitis was 7.41 and occurs mostly in lactating cows of over four years. All fore and hindlimbs were affected but the hindlimbs were more frequently affected than fore claws (Greenough *et al.*, 1981, Weaver *et al.*, 1981).

**Heel erosion**

In this study the heel erosion occurred at the rate of 7.41% which is almost similar to the study by Clarkson *et al.* (1993) who showed 6.5% and 11.8% reported by Choquette-Levy *et al.* (1985). Only hindlimbs were affected.

Only pregnant cows of over 3 years were found to be affected, such suggestion was given by Peterse (1992) who found that in old age heel erosion acts as a predisposing factor to sole ulcer. It was also agreed by Livesey *et al.* (1998) who reported that metabolic stress in late pregnancy or early lactation may have contribution to the development of heel erosions depressing horn quality or horn growth rate.

**White line disease**

White line disease was 3.7% (1/27) found in this study which is lower than the Greenough *et al.* (1981) who identified 20% cows affected with white line disease, Choquette-Levy *et al.* (1985) found 12% and Tranter and Morris (1991) observed an incidence of 39% in three herds.

In this study it was found that the incidence of claw affections was relatively higher due to loss of horny substance and mechanical stress due to concrete flooring systems, which correspond to the study reported by Weaver *et al.* (1981).

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