

## Prevalence of Metabolic Disease in Cattle in Sylhet, Bangladesh

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### ABSTRACT

*Metabolic diseases are one of the major reasons for huge economic losses to the dairy farmers globally. This study aims to determine prevalence of metabolic disease in cattle in Sylhet, Bangladesh. The data on metabolic diseases were collected from Sylhet Veterinary Hospital from December 2015 to December 2016. In total 1252 animals results showed that during the summer season (March-June), Milk Fever (1.39%), Ketosis (0.23%), and Downers cow syndrome (0.47%) were the major metabolic disease observed where no case of lactation Tetany observed. In Rainy Season (July- October) Milk fever (1.58%), Ketosis (0.25%), Lactation Tetany (0.25%), Downers cow syndrome (0.25%) were observed. In winter season (November -February) Milk fever (1.31%), Ketosis (0.26%), Lactation Tetany (0.26%), Downers cow syndrome (0.52%). In summary, we found that highest occurrence of Milk fever was during Rainy season (1.58%), while occurrence of Ketosis, Lactation Tetany and Downers Cow Syndrome was observed more during winter season which was (0.26%) and (0.52%) respectively. Metabolic disorders were more frequent during in transition period in dairy cows and when there were sudden changes in diet and gaps between nutrient supply and demand. We suggest farmers to be aware during high risk periods to reduce the prevalence of metabolic diseases.*

**Keywords:** *Metabolic, Ketosis, Transition, Nutrient*

### INTRODUCTION

Bangladesh has 24 million cattle, out of which 6 million are dairy cattle of local and crossbreds (DLS, 2008). The majority of the dairy cattle are in the hands of smallholder dairy producers. The estimated numbers of dairy farms in Bangladesh is 1.4 million (T. Hemme, "IFCN Dairy Report", 2008). Bangladesh is a populated, rural and agrarian country located in South Asia. Cattle are important component of the mixed farming system practiced in Bangladesh from a long time. In Bangladesh, livestock population is also high and near about 80% of population is employed in agriculture and livestock farming (BBS, 2008). Metabolic diseases continues to be a substantial challenge to in the modern dairy industry, not only in Bangladesh but globally where modern

dairy cattle breeds are managed and fed for high milk yields. The prevalence of metabolic diseases has been reduced globally in the last four decades; however there are still some of metabolic diseases that continue to negatively impact economics of farmers through reduction in production efficiency (Christy and Thirunavukkarasu, 2006) Disease outbreak among dairy cows constitutes a problem both in terms of financial losses (value of dead cow, decreased production and extra labor) and compromised animal welfare (suffering before death or euthanasia), (Thomsen and Houe, 2006). The nutritional management of dairy cows during the transition period has been extensively studied due to the severe adjustments that cows must face to meet metabolic challenge of high milk yield (Overton T.R. & Waldron M.R. 2004). The metabolic diseases or disorders of production are caused by an imbalance of intake of dietary feed nutrients that enter the animal organism (glucides, proteins, minerals, and water). Nutritional imbalances in livestock occurs because the supply of foods do not meet nutritional requirements for maintenance, growth, production, reproduction of the animals (Martinez *et al*, 2014). Cows in higher producing herds are at increased risk of Parturient paresis, Udder edema, and Ketosis. Cows that had higher previous yields will generally be at increased risk of Pre and post parturient Milk fever and ketosis. The imbalance of insufficient concentrations of calcium in the blood to allow normal bodily functions can cause Periparturient hypocalcemic paresis, more commonly known as milk fever. Early lactation is often associated with other common noninfectious disorders such as displacement of the abomasum and rumen acidosis. Dystocia, prolapsed uterus, other infertility, and abortion were not risk factors for any of the metabolic disorders; however, retained placenta, early metritis, traumatic reticuloperitonitis, acute and chronic mastitis, and foot or leg injury each were direct risk factors for some metabolic disorders. (Gröhn *et al*, 1989). The objective of this study was (i) to determine the prevalence of metabolic diseases of cattle, and (ii) to know the economic importance of metabolic diseases of cattle.

## **MATERIALS AND METHODS**

### **Study area and time**

The data were collected from daily patient register book of Veterinary Hospital, Sylhet and farms around Sylhet Agricultural University (Figure 1) from December 2015 to December 2016. The study was conducted under the Department of Medicine, Sylhet Agricultural University, Sylhet-3100.

### **Study population**

The study was conducted on cattle population of Sylhet and record book of Veterinary Hospital.

### **Data collection procedure**

The data were collected from the daily patient register book of District veterinary Hospital.

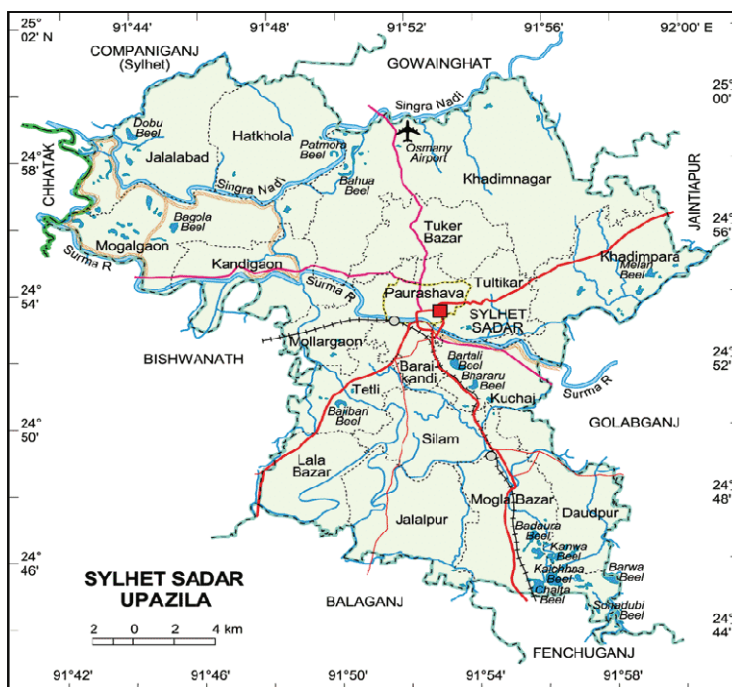


Figure 1. Study area in Sylhet, Bangladesh

## RESULTS AND DISCUSSION

This study was conducted in Sylhet Government Veterinary Hospital, Sylhet in order to determine the prevalence of metabolic diseases in cattle and factors associate with the metabolic diseases. The following data were collected from monthly report (December 2015 to December 2016) of District veterinary Hospital, Sylhet.

Table.1: Prevalence of Metabolic Diseases of Cattle in Sylhet (Dec 2015 to Dec 2016)

| Month /diseases | Total affected animals | Milk fever |                 | Ketosis |                 | Lactation Tetany |                 | Downers cow syndrome |                 |
|-----------------|------------------------|------------|-----------------|---------|-----------------|------------------|-----------------|----------------------|-----------------|
|                 |                        | Cas e      | Prevalen ce (%) | Cas e   | Prevalen ce (%) | Cas e            | Prevalen ce (%) | Cas e                | Prevalen ce (%) |
| January         | 105                    | 1          | 0.95            | 1       | 0.95            | -                | -               | 1                    | 0.95            |
| February        | 90                     | 2          | 2.22            | -       | -               | 1                | 1.11            | -                    | -               |
| March           | 95                     | 1          | 1.05            | -       | -               | -                | -               | 1                    | 1.05            |
| April           | 112                    | 3          | 2.67            | -       | -               | -                | -               | 1                    | 0.89            |
| May             | 110                    | 2          | 1.81            | 1       | -               | -                | -               | -                    | -               |
| June            | 122                    | -          | -               | -       | -               | -                | -               | -                    | -               |

|           |      |    |      |   |      |   |      |   |      |
|-----------|------|----|------|---|------|---|------|---|------|
| July      | 128  | 3  | 2.34 | - | -    | - | -    | 1 | 0.78 |
| August    | 118  | 1  | 0.84 | - | -    | - | -    | - | -    |
| September | 96   | 2  | 2.08 | 1 | 1.04 | 1 | 1.04 | - | -    |
| October   | 100  | 1  | 1.00 | - | -    | - | -    | - | -    |
| November  | 90   | 2  | 2.22 | - | -    | - | -    | 1 | 1.11 |
| December  | 86   | -  | -    | - | -    | - | -    | - | -    |
| Total     | 1252 | 18 | 1.43 | 3 | 0.24 | 2 | 0.15 | 5 | 0.40 |

Source: District Veterinary Hospital, Sylhet

In the table shows the important metabolic diseases which were found in Sylhet. to Dec 2015 to Dec 2016 one year report indicate the Prevalence (%) of metabolic diseases of cattle are Milk fever ( 1.43% ) , Ketosis (0.24%), Lactation tetany (0.15%) and Downers cow syndrome (0.40%). We found that most of incidence of the metabolic disease is in the transition phase, defined as the period between three weeks before to three weeks after parturition (Wittwer, F., 2000), is the most challenging and critical period in relation to the dairy cow's health status during the lactation cycle. Major physiological, nutritional, metabolic, and immunological changes occur within this time frame as the production cycle of the cow shifts from a gestational nonlactating state to the onset of copious milk synthesis and secretion (Wittwer, F., 2000, Drackley J.K., 1999).

### Seasonal variation of metabolic disease of cattle

The seasonal variation of metabolic diseases of the year 2015-2016 was divided into three different seasons as follows- summer (March-June), Rainy (July-Oct.) and winter (Nov.-Feb.) season.

Table.2: Seasonal Variation of metabolic diseases of cattle (December 2015 to December 2016)

| Seasons             | Total affected animals | Milk fever |                | Ketosis |                | Lactation tetany |                | Downers cow syndrome |                |
|---------------------|------------------------|------------|----------------|---------|----------------|------------------|----------------|----------------------|----------------|
|                     |                        | Case       | Prevalence (%) | Case    | Prevalence (%) | Case             | Prevalence (%) | Case                 | Prevalence (%) |
| Summer (March-Jun), | 429                    | 6          | 1.39           | 1       | 0.23           | 0                | 0.00           | 2                    | 0.47           |
| Rainy (July-Oct.)   | 442                    | 7          | 1.58           | 1       | 0.25           | 1                | 0.25           | 1                    | 0.25           |
| Winter (Nov.-Feb.)  | 381                    | 5          | 1.31           | 1       | 0.26           | 1                | 0.26           | 2                    | 0.52           |
| Total               | 1252                   | 18         | 1.43           | 3       | 0.24           | 2                | 0.15           | 5                    | 0.40           |

In the table season wise prevalence (%) of different metabolic diseases of cattle are presented. The clinical prevalence (%) of different metabolic diseases of cattle observed in the summer season (March-June), Milk fever 1.39%, Ketosis 0.23%, Lactation Tetany 0.00%, and Downers cow syndrome 0.47%. In Rainy season (July- Oct.), Milk fever 1.58%, Ketosis 0.25%, Lactation tetany 0.25%, Downers cow syndrome 0.25%. In winter season (November-February) Milk fever 1.31%, Ketosis 0.26%, Lactation tetany 0.26%, Downers cow syndrome 0.52%. Here shows that highest occurrence of Milk fever in Rainy season (1.58%), Ketosis, Lactation Tetany, Downers cow syndrome in Winter season 0.26%, 0.26% and 0.52% respectively. As well as the present study shows that total prevalence of metabolic diseases is 2.22% in 2015-2016. The study correlated with the findings of the Rahman (2010) reported that seasonal differences, three major seasons-summer (mid-February to mid-June), rainy (mid-June to mid-October) and winter (mid-October to mid-February) were considered. The percentages of major diagnostic groups were parasitic (29.2%), general and systemic (28.7%) and metabolic disease (14.7%). Whereas, bacterial, congenital, fungal and surgical disease cases were found as 6.3%, 5.3%, 4.3% and 4.8% respectively.

The prevalence of different metabolic diseases in Sylhet was 2.22%. Findings of the present study were lower than the earlier findings of Dohoo and Martin (1984a) found that the prevalence of ketosis was 12.10% in cows. Ketosis 5.45% in cattle was evidenced. Ketosis in cattle was 5% in winter, followed by 9.52% in summer and 8.33% in winter whereas Downers cow syndrome was recorded in 7.27% cattle and it was 10% during winter followed by summer (4.76%) and (7.14%) rainy seasons (Lucky *et al.*, 2016). Milk fever was recorded as 14.54% in cattle. However, it was 20% during winter followed by summer (9.52%) and rainy (14.29%) seasons in cattle (Bar and Ezr, 2005) observed clinical hypocalcemia before, during or after calving caused by milk fever. (Thirunavukkarasu *et al.*, 2010) reported that among the 3774 cows in five milk sheds at the State of Tamil Nadu, 516 (13.67%) were affected with milk fever. Hutjens (2003) studied on Israeli Holstein cows and reported that 8% of the pretentious animals died and culled were 12% of them due to milk fever. Even in studies in which milk fever was not constrained to be a periparturient disorder, it is clear that the disorder is rare at other times. The median day of diagnosis was the day of calving or (Dohoo *et al.*, 1983) the day after calving (Grohn *et al.*, 1986), and 140 out of 143 cases were diagnosed within 15 day of postpartum (Erb *et al.*, 1984). The prevalence of metabolic diseases was showed that highest occurrence of Milk fever in Rainy season (1.58%), Ketosis, Lactation Tetany, Downers cow syndrome in Winter season 0.26%, 0.26% and 0.52% respectively. As well as the present study shows that total prevalence of metabolic diseases is 2.22% in 2015-2016.

## CONCLUSION

The overall prevalence of metabolic diseases in cattle was relatively lower in study area. Milk fever is uncommon before the third parturition and incidence is highest at the fifth or sixth parturition. Thus, cows are most likely to develop milk fever during their most productive years. Economic losses due to milk fever occur due to expenditure on treatment of disease affected animals and reduction in quantity of milk. Therefore, implementing nutritional and health programs that reduce the risk of metabolic disturbances are expected to not only improve cow health, but also enhance fertility. Low nutrient intake coupled with high energy demand during the transition period will increase the risk of occurrence of metabolic disorders. Strategies to

manipulate peripartum metabolic health involve dietary formulation to minimize the degree and extent of negative nutrient balance, improve Ca homeostasis, and minimize the severity of negative energy balance. Some owners cull and slaughter older, high producing cows from a herd, because of a history of repeated case of milk fever. There are few cases of Downer Cow Syndrome.

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