

Journal of Chemical, Biological and Physical Sciences



An International Peer Review E-3 Journal of Sciences

Available online at www.jcbps.org

Section D: Environmental Sciences

CODEN (USA): JCBPAT

Research Article

Prevalence of mastitis in dairy cows in selected areas of Sylhet district, Bangladesh

Jannatul Mawa Momu¹, Mahfuz Rahman Adnan¹, Mowdudul Hasan Talha¹, Mamun Ur Rahman¹, Mustaq Ahmad¹, Akash Khasnobish², Md. Abdus Sabur¹, Md. Altafur Rahman¹, Md. Anwar Hossain³

¹MS Fellow, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Bangladesh; ²Executive Technical Officer, Sk+F Pharmaceuticals Ltd, Bangladesh; ³Professor, Department of Pharmacology and Toxicology, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Bangladesh.

Received: 12 December 2017; **Revised:** 09 February 2018; **Accepted:** 18 February 2018

Abstract: This study was carried out to determine the prevalence of mastitis in lactating Dairy Cow at District Dairy Farms in Sylhet and UVH, at Jaintapur during the period of January 2016 to December 2016. Mastitis was most frequently seen in cross breed cows. In Jaintapur Upazilla, most of cows were indigenous, but there were many farmers rear cross breed cow for the purpose of selling milk in market. In Dairy Farm, all cows were cross breed. The overall prevalence was higher in crossbred cows than indigenous cows. The prevalence of mastitis was higher in advancing age and in lactation period. The cows were more prone to mastitis during 1st month of lactation. There was significant relationship between prevalence of mastitis and associated risk factors like general physical condition, herd size, frequency of dung removal, floor drainage quality and condition of floor. Reproductive diseases and periparturiant diseases showed higher incidence of mastitis in cows. The overall prevalence of mastitis at Jaintapur was 7.15%. The prevalence of mastitis of dairy cows in Jaintapur Upazilla was more in rainy season and less in winter season. The prevalence of mastitis was 3.47% in summer season, 11.52% in rainy season and 5% in winter season. The overall prevalence of mastitis at Dairy

farm was 6.91%. The prevalence of mastitis in dairy farm was more in rainy season and less in summer season. The prevalence of mastitis was 4.97% in summer season; 16.53% in rainy season and 5.29% in winter season.

Keyword: Breed, lactating, Mastitis, Sylhet, Udder

INTRODUCTION

Bangladesh has 24 million cattle, out of which 6 million are dairy cattle of local and crossbreds¹. 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 million². It is the part of the mixed farming systems and a predominant source of income and nutrition and jobs. Milk is the major sources of money income from dairying. Annual milk production in Bangladesh is 16.2 lack metric tons and about 64% milk comes from cattle³. However, Bangladesh has an acute shortage of milk. The produced milk can fulfill only 13.6% of the total requirement in Bangladesh. Dairying in Bangladesh is growing faster but it also faces lot of problems of high input and low output prices. Disease, along with non-availability of feed resources and nutrition are the most important constraints to milk production. The term "Mastitis" derives from Greck word Mastos which means breast (mammary gland) and its meaning inflammation, which is inflammation of the mammary gland is called Mastitis.

Mastitis is the term, which means inflammation of parenchyma of the mammary gland (udder) regardless of the cause. It is characteristics by physical, chemical and microbiological changes in the milk and by pathological change in the glandular tissues of the udder. The most important changes in the milk include discoloration, the presence of clots and the presence of abnormally large number of leukocytes. Bovine mastitis (both clinical and subclinical) is one of the most important diseases causing considerable economical loss to the farmers and the dairy industry and is mainly caused by bacterial infection in the udder. The mastitis can be diagnosed on history and clinical findings but laboratory examinations ascertain the sub clinical mastitis.

The loss due to subclinical mastitis (SCM) has been estimated to be Rs. 1058 million per annum in India which was three times more than that caused clinical mastitis⁴. The prevalence of SCM has been shown to be 15 to 40 times more than the clinical mastitis⁵. However, no such estimation of economic loss due to mastitis is available from Bangladesh. Reduction in the milk in SCM in not only responsible for great economic loss to the dairy industry but also acts as a carrier and source of infection for healthy milch cows which is one of the biggest obstacles in the achievement of self-sufficiency in milk production in Bangladesh. Mastitis not only affects the milk yield adversely, but in many cases alters the consumption of milk in such a way that it is rendered unsuitable for preparation of certain milk products⁶. The residual effects of many commonly used antibiotics, and chemotherapeutic agents in treating cases of mastitis, pathogenic microorganism in milk (if used without boiling) can also be a potential danger to human health. So to overcome a major hurdle in the way of achieving self-sufficiency in milk production, it seems to be prime importance to prevent the incidence of mastitis by early diagnosis of subclinical form of the disease as otherwise this subclinical form may lead to clinical which is irreversible in most cases.

The mastitis causative organisms are ubiquitous in nature and persist long time in the cow yard or barns and there is chance of constant udder infection under poor hygienic and management systems^{7,8}. Epidemiological studies on mastitis revealed that mastitogenic organisms are widespread on different body sites of the cows, milker's hands, milking cans and in the milk samples. Teat

apices have been reported to be the most common site⁹, from where these organisms have been isolated^{10,11}. The mastitis causing organism, Staphylococci, the chief under pathogen, has been isolated from almost all the body site examined and the environment but Streptococci from fewer body sited, whereas the prevalence of *Escherichia coli* has been reported to be widespread¹¹⁻¹³. Very limited research works on mastitis have been carried out in Bangladesh¹⁴⁻¹⁷. For the purposes of the study, the author were very interested to know the prevalence of mastitis in dairy cow at Sylhet district.

2. MATERIALS AND METHODS

2.1. Study areas: The study was conducted at 2 different areas of Sylhet district to study the prevalence of mastitis. The data was collected from UVH, Jaintapur Upazilla and District Dairy Farm, Sylhet.

2.2. Study population: Total cows of 49 were sampled from Veterinary Hospital of JaintapurUpazilla and Dairy farm, Sylhet.

2.3.Period of study: The study on prevalence and use of antibiotics were conducted from 1st January 2016 to 31st December 2016 in the study area when stay at Veterinary Hospital of JaintapurUpazilla and Dairy farm, Sylhet for internship base learning.

2.4. Source of data collection: Upazilla Veterinary Hospital and Dairy farm of Sylhet were the sources of population for conducting the study.

2.5. Methods of data collection: This data was collected from the record book of the Veterinary Hospital of Jaintapur Upazilla and Dairy farm, Sylhet. The following step were taken for conducting the study. A structured questionnaire was developed and asked and the pre-tested questionnaire was filled. Each questionnaire asking time was about 10-15 minutes. The questionnaire contained information regarding age, breed, health, stage of lactation and management status. Open ended questions were collected and recorded.

2.6 Study design

$$\text{Prevalence} = \frac{\text{Number of animals with the disease}}{\text{Number of animals at risk}} \times 100$$

Percentage was used to express the prevalence of mastitis of dairy cows in Jaintapur Upazilla and Dairy Farm, Sylhet.

2.7. Diagnostic Procedure: Diagnosis of clinical mastitis performed on the basis of clinical signs showed by the animals. It can be interpreted in following forms-

- **Mild Form:** Flakes and clots were found in milk. Slight swelling of infected quarter was found. Systemic reaction and fever was absent.
- **Moderate Form:** Generalized swelling of infected quarter and painful udder was found. Abnormality in milk also was manifested without systemic reaction.
- **Severe Form:** The secretion was abnormal with hot and swollen quarter or udder.
- Fever, rapid pulse, loss of appetite, dehydration and depression was manifested.

2.8. Data Analysis: All collected data were entered into Microsoft Excel spreadsheet. The prevalence of clinical mastitis was the dependent variable while source of patient, age, general physical condition were independent variables considered at cow level.

3. RESULTS AND DISCUSSIONS

The prevalence of mastitis in January was 3.77%. As the same way in February, March, April, May, June, July, August, September, October, November, December, the total number of animals examined were 46,51,55,40,32,35,59,36,36,34,26 respectively and the affected animals were 2,3,2,1,2,1,5,4,4,5,2,1. So the prevalence of mastitis in those month were 6.52%, 3.92%, 1.82%, 5%, 3.13%, 14.28%, 6.78%, 11.11%, 13.89%, 5.88%, 3.84% respectively. From the above discussion it has been seen that the highest prevalence was in July and low in April. The overall prevalence of mastitis at Jaintapur was 7.15%. From the result, it has been seen that the highest prevalence was in July and low in January. The overall prevalence of mastitis at Dairy Farm was 6.91%. Age is an important factor of mastitis. From **table 3**, it has been seen that the age between 9-19 years of animals were more susceptible to mastitis. So the prevalence of mastitis between 3-6 years was 4.79%. The prevalence of mastitis between 7-8 years was 7.09%.

The prevalence was 9.23%. From this data, the highest prevalence of mastitis is related to 9-19 years of age and the lowest prevalence was in 3-6 years of age. From **table 4**, it has been seen that the age between 9-19 years of animals were more susceptible to mastitis. From this data, the highest prevalence of mastitis was related to 9-19 years of age and the lowest prevalence was in 3-6 years of age. The environment factor is one of the most important factors for the cause of mastitis in dairy cows. This data was collected from Jaintapur Upazilla Veterinary Hospital. From **figure 1**, the prevalence of mastitis in summer season (March, April, May, June) was 3.47% and in rainy season (July, August, September, October) was 11.52% and in winter season (November, December, January, February) was 5%. From the result, it has been seen that the highest prevalence of mastitis was in rainy season and low in summer season. From **figure 1**, the prevalence of mastitis at Dairy farm in summer season (March, April, May, June) was 4.97% and in rainy season (July, August, September, October) was 16.53% and in winter season (November, December, January, February) is 5.29%. The highest prevalence of mastitis was 7.19% found in local breed and lowest 6.79% in cross breed (**Figure 2**). The **figure 3** showed that there was 2.89%, 5.18%, 8.33%, 8.75% and 15.38% prevalence at 1st, 2nd, 3rd, 4th and 5th lactation respectively.

The rate of increasing prevalence was highly significant. The prevalence was much higher in 5th lactation than others. In Dairy Farm, Sylhet, the overall prevalence of mastitis was 8.24% and the prevalence of mastitis in Jaintapur was 2.20%. Findings of the present study was lower than the earlier findings of Kader *et al.*¹⁸ who reported 46.6%. In Jaintapur Veterinary Hospital, The prevalence of mastitis was recorded as 4.79%, 7.09%, and 9.23% respectively at the age group of 3-6 years, 7-8 years and 9-11 years. In Dairy Farm, Sylhet prevalence of mastitis was recorded as 3.23%, 7.27% and 9.85% respectively at the age group of 3-6 years, 7-8 years and 9-11 years. The prevalence of clinical mastitis was also increased in older cows. Similar observation was also reported by Rahman *et al.*¹⁸ and Pluvinaige *et al.*¹⁹. Rahman *et al.*,¹⁸ reported 57.5% prevalence of mastitis in the age group of higher than 9 years old and 40.1% in the age group of 7 and 8 years. Similarly Biffa *et al.*²¹ suggested older cows are at more risk (44.6%) for the incidence of mastitis than younger cows (23.6%). The present study revealed that high incidence of mastitis was recorded during monsoon season which is in agreement with Shinde *et al.*²¹, Jadhav *et al.*²² and Devi *et al.*²³. All the cows of Dairy Farm, Sylhet were cross breed and the prevalence of mastitis was 6.91% whereas local and cross breed of Jaintapur Upazilla, the prevalence of mastitis was 7.19% and 6.79% respectively.

Table 1: Prevalence of mastitis of dairy cows from January 2016 to December 2016 at Jaintapur

Month	Animal examined	Affected animal (Mastitis)	Prevalence (%)
January	53	2	3.77
February	46	3	6.52
March	51	2	3.92
April	55	1	1.82
May	40	2	5
June	32	1	3.13
July	35	5	14.28
August	59	4	6.78
September	36	4	11.11
October	36	5	13.89
November	34	2	5.88
December	26	1	3.84
	Total-503	Total -36	7.15

Table 2: Prevalence of mastitis of dairy cows from January 2016 to December 2016 at dairy Farm, Sylhet

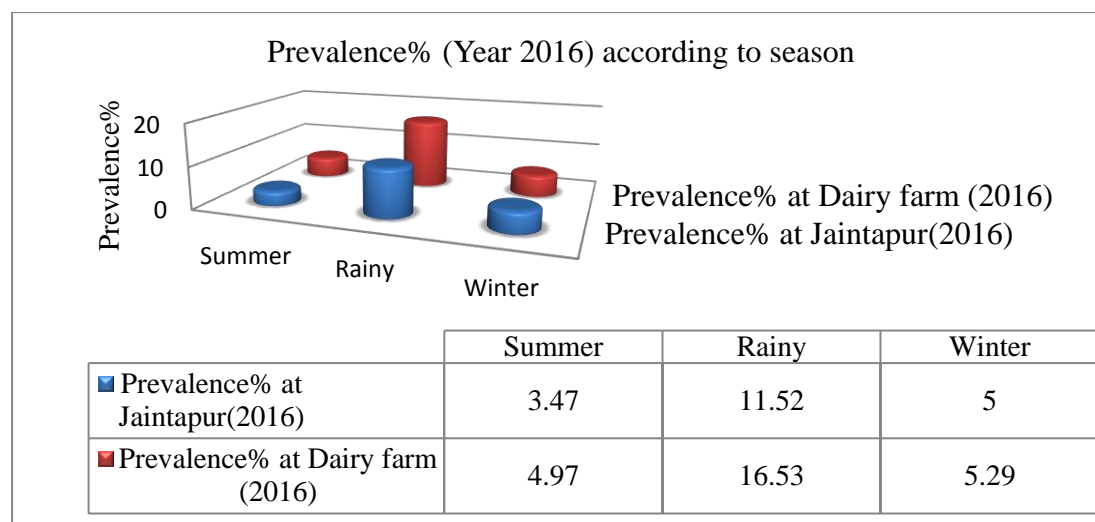
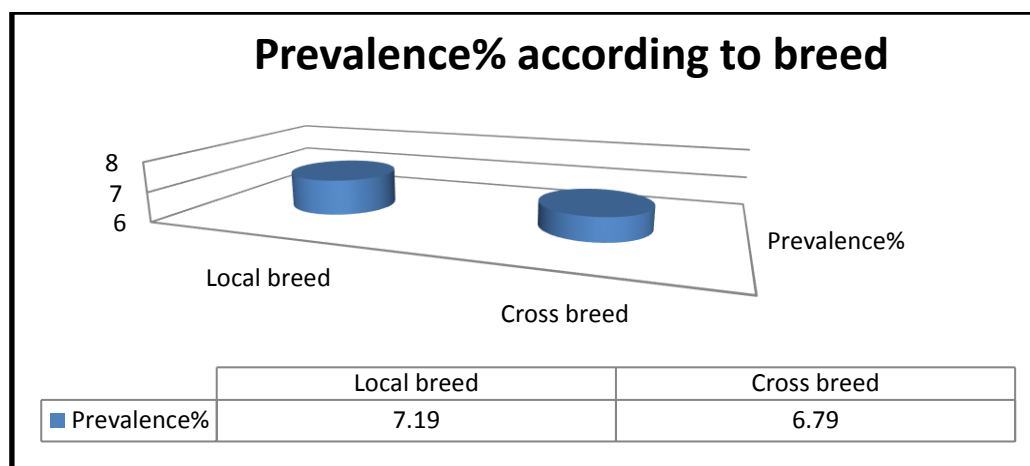
Month	Animal examined	Affected animal (Mastitis)	Prevalence (%)
January	30	1	3.33
February	14	0	0
March	11	1	9.09
April	19	1	5.26
May	18	1	5.55
June	16	0	0
July	8	2	25
August	16	1	6.25
September	11	2	18.18
October	12	2	16.67
November	12	1	8.33
December	21	2	9.52
	Total-188	Total-13	6.91

Table 3: Prevalence of mastitis according to age at Jaintapur (2016)

Age (year)	Animal examined	Affected animal	Prevalence (%)
3-6	167	8	4.79
7-8	141	10	7.09
9-19	195	18	9.23
	Total-503	Total-36	

Table 4: Prevalence of mastitis according to age at Dairy Farm, Sylhet (2016)

Age (year)	Animal examined	Affected animal	Prevalence (%)
3-6	62	2	3.23
7-8	55	4	7.27
9-11	71	7	9.85
Total	188	13	

**Figure 1.** Season wisePrevalence% of mastitis at JaintapurUpazilla (2016) and Dairy Farm , Sylhet.**Figure 2.** Prevalence% of mastitis according to breed at JaintapurUpazilla (2016)

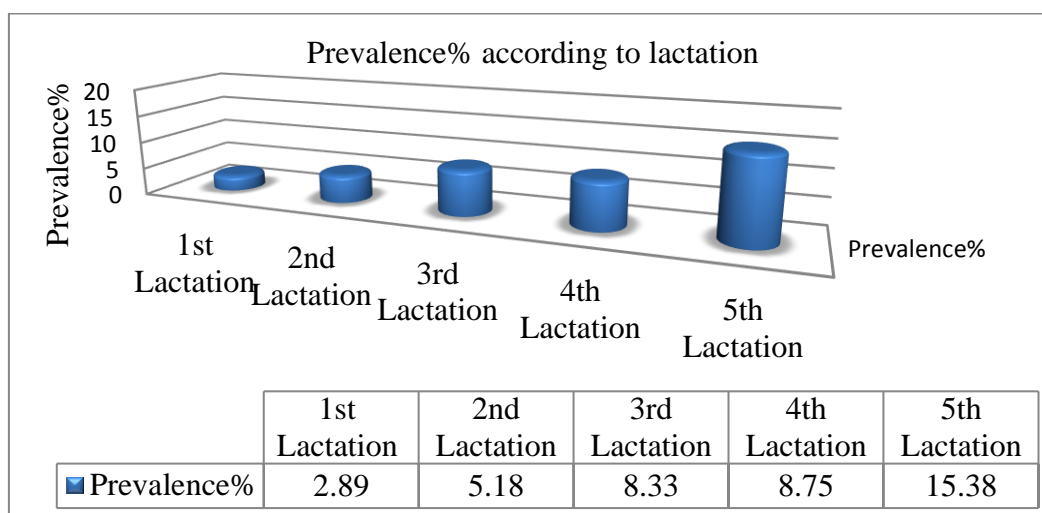


Figure 3: Prevalence% of mastitis according to lactation number

The results of this study was lower than that of Rabbani²⁵ who reported 20.31% in Holstein Friesian cross cows and 13.24% in Red Chittagong cows and of Prodhan *et al.*¹⁶ who reported 16.52% and 15.77% incidence of mastitis. The exotic breeds like Jersey are more susceptible to bovine mastitis than indigenous breeds Dutta *et al.*²⁵ concluded the risk ratio of developing mastitis in Jersey was approximately two times higher than indigenous breeds. Similarly Biffa *et al.*²⁰ reported HF cows are affected at higher rate (56.5%) compared with local zebu (30.9%) and Jersey cows (28.9%). The number of lactations had a significant effect on the prevalence of mastitis irrespective of seasons. The prevalence of mastitis was the lowest in first lactation and the highest in 5th lactation. Regarding parity, several studies were in agreement with the present findings of increased mastitis in advancing age and parity²⁶.

4. CONCLUSION

The overall prevalence of clinical mastitis in cows was relatively lower in the study area. The prevalence of mastitis was higher in advancing age and in 5th lactation period. Mastitis is one of the major important diseases of milch cows throughout the world including Bangladesh. Proper hygienic management of the farm house and utensils and treatment regimens should be followed to reduce the economic loss and also the prevalence of disease different epidemiological factors that interplay in mastitis occurrence.

5. RECOMMENDATIONS

- Strict maintain hygienic measurement during milking time.
- Post-milking teat dipping by antiseptics.
- Dry cow treatment of all quarters of all cows.
- Use of properly functioning milking machines.
- Culling of chronic mastitis cows from the farm.
- Use of segregation if practical.
- Treatment of new clinical cases promptly.

6. ACKNOWLEDGEMENT

This study was the Internship report writing of the 1st author. The author was very much grateful to the authority of dairy farm, Sylhet and veterinary Surgeon, Jaintapur Upazilla for providing all necessary information to complete this study. All authors were share their scientific knowledge in optimum level and approved the final manuscript.

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*** Corresponding author: Md. Matiur Rahman**

Assistant Professor, Department of Medicine, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Bangladesh; email: matiur.dvm@sau.ac.bd

Online publication Date: 18.02.2018