Financial Impact of Bovine Mastitis on Dairy Farming in Chattogram District

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Table of contents

List of Abbreviation

BCR	Benefit cost Ratio
BDT	Bangladeshi taka
CVASU	Chattogram Veterinary and Animal Sciences University
DLS	Department of Livestock Services
DVM	Doctor of Veterinary Medicine
Etc.	Et cetera
Et al	et alia (and others)
Govt.	Government
SCM	Subclinical Mastitis
HSC	Higher Secondary School Certificate
Tk	Taka

List of Tables

List of Figures

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Abstract

A cross sectional study was undertaken to analyze the socio-economic status, compare profitability before and after mastitis and risk factors of bovine mastitis at dairy cattle farming at Chattogram district, Bangladesh. A total of 40 farms were selected by random sampling methods. A pretested questionnaire was used to collect the data from the farmers during January to April, 2023. Both descriptive statistics and econometric analysis were used for analyzing the data. The study reveals that 55% of total farmers had their secondary schooling with an experience of 10 years of farming. About 55% of the farmer earned Tk. 36000-50000 as monthly income. Average milk production of dairy cow before mastitis was 20.63 liter and after mastitis was 14.63 liters. Gross margin was Tk. 894.37±450.23 before mastitis and Tk. -1678 ±2008.46 after mastitis. Net return was Tk. 889.61±451.91 before mastitis and Tk. -1683.17 ±2008.46 after mastitis per cattle per day. The BCR was 1.13 indicating that dairy farming is still profitable in the study area before mastitis. But the BCR after mastitis was 0.04, which indicates that the farms of the study area faced economical losses due to mastitis. The study also point out some risk factors (age, parity hygiene of the farm, hygiene of the udder) associated with bovine mastitis at that area.

Key words: Bovine, Mastitis, Paired t test, Profitability .

Introduction

Background of the study

The dairy industry is gradually growing in Bangladesh, and cross-bred cows provide the majority of the country's milk supply. To combat poverty and fulfil each person's daily demand of 250 mL of milk, increasing milk production has been prioritized in developing nations like Bangladesh. According to recent studies, the nation currently produces 69% of the milk required for self-sufficiency (DLS, 2021). Since 1959 a national AI programme has been used to replace indigenous cows nationwide with crossbred cows (Holstein × Friesian × Indigenous and Holstein Friesian × Sahiwal × Indigenous) (DoF, 2019). These cows are more susceptible to be affected with mastitis, other udder diseases and production-related illnesses, though (Curone et al., 2018).

Mastitis is one of the major production disease and is the main reason for economic losses for dairy industry. It denotes the inflammation of the mammary gland parenchyma and is a complicated illness with several etiologies. It is distinguished by pathological alterations in glandular milk as well as physical, chemical, and typically bacteriological abnormalities in milk. The disease development results from the interaction of three main components: environmental conditions, host resistance, and infectious pathogens (FAO, 2014). Bovine mastitis is primarily caused by bacterial pathogens, with the most common being *Staphylococcus aureus, Streptococcus agalactiae, Escherichia coli, and Streptococcus uberis*. These pathogens gain entry into the udder through various routes, including the teat canal during milking, environmental contamination, or ascending infections from the cow's own skin or digestive tract. Inadequate hygiene practices, improper milking procedures, and poor cow comfort can contribute to the risk of mastitis.

Diagnostic tools include physical, chemical, and/or biological changes or markers, such as lactose, somatic cell count (SCC), microbial load, electrical conductivity, biochemicals (e.g., metabolic substances), proteins (e.g., amyloid A), peptides, and enzymes (e.g., N-acetyl-b-D-glucosaminidase, alkaline phosphatase (ALP), lactate

dehydrogenase (LDH), lactose, and some novel biomarkers). A variety of advanced diagnostic techniques are available for use in diagnosing mastitis, including conventional examinations, SCC, the California mastitis test (CMT), and the polymerase chain reaction (PCR), loop mediated isothermal amplification (LAMP), lateral flow assays, genomic, transcriptomic, and proteomic analyses, as well as nano- and micro-fabrication of portable devices. Some of these techniques can be used independently or in conjunction with one another (Chakraborty et al., 2019).

Mastitis not only compromises the welfare of dairy cows but also leads to substantial financial losses for farmers and the dairy industry as a whole. It is one of the main cause of economic losses of dairy farming. Production losses and control-related expenses are the two primary categories into which the costs of bovine mastitis may be categorized and represented. Financial losses owing to mastitis is characterized as a decrease in output. (Azooz et al., 2020).

Besides, Mastitis poses a risk to public health due to worries about antibiotic resistance and the careless use of antibiotics and other medications that have negative effects on people. When antibiotics are used carelessly and inappropriately, milk and meat from treated animals may include antibiotic residues, which can contribute to the emergence of antibiotic resistance (White & McDermott, 2001).

Chattogram district is a region with a notable presence of dairy farming. The district's favorable climate and availability of resources make it an important dairy production region and make it regionally relevant to local agricultural practices and the economy. The prevalence of SCM by CMT, WST and SFMT were 32.43%, 33.56% and 31.53% respectively (M. Barua et al., 2014). In another study, in chattogram district the prevalence of clinical mastitis was found 8.36% (Bari et al., 2016).

Mastitis causes immense loss to the dairy industry and the annual economic losses due to mastitis have calculated to be Tk. 122.6 (US $2.11) million (Bari et al., 2016).

Justification of the study

At Chattogram district there are many dairy farms and the farmers face economical losses due to mastitis as it is very prevalent here. It is also responsible for the health hazards for cattle. Understanding the prevalence and economical importance of the bovine mastitis, this study is conducted to assess the economic implications and risk factors at Chattogram district.

Objectives of the study :

1. To find out the socioeconomic status of dairy cattle farmers.

2. Explore the specific costs and losses incurred by farmers and compare the profitability of dairy farmers before and after mastitis.

3. Identify the risk factors associated with mastitis.

Materials And Methods

Study Design, Study Area and Duration:

A cross-sectional study was performed with the field data gathered from the Chittagong district between January 2023 to April of 2023. The study was conducted at twelve places named Patiya, Sikolbaha, Hathazari, Vatiary, Charlokkha, Baklia, Patenga, Chawkbazar, Chandanais, Kalurghat, Chandgaon, and Karnafully.

Figure 1 : The picture shows the study area

Selection of sample size

A total of 40 (Forty) farms were randomly selected for this study. The dairy cattle used in the study were from herds of commercial intensive dairy farmers. The farms which have records of occurring mastitis, have at least 20 milch cow, and willingness of the dairy farmers are the selecting factors of farm . All the information economic information was gathered from pertinent documents kept on such farms. The age range of the cows, depending on their lactation stage, was 2 to 10 years.

Preparation of questionnaire

Expert estimates and data from the literature were used to create the questionnaire. Three groups constituted the questionnaire's question types. The first concentrated on general farm features and socioeconomic information (Farm name, owner name, location, mobile no, education, monthly income etc). Risk factors (age, parity, hygiene of farm, stocking density, cleanliness before and after milking, ventilation) fell under the second group. The third group was determined by the farms' cost and return policies. The questionnaire was again assessed where necessary topics were added, and unnecessary questions were omitted on the basis of practical experiences.

Collection of data

All data were collected using questionnaire by visiting the farms in the study area between January 2023 to April 2023. The farmers were interviewed face to face. Before interviewing a brief idea was given to the farmers about the purpose and impact of the study.

Figure 2 : Data collection from farmer

Data coding, entry and cleaning

The questionnaire was checked for completeness, cleaned, organized and coded after data collection. Then the data was entered in MS-Excel spread sheet before being converted to STATA program (STATA,14,. Statistical Software) for analysis.

Statistical Analysis

Socioeconomic characteristics, risk factors and cost and return estimation related to bovine mastitis were identified using descriptive and econometric method respectively. Farm profitability were analyzed by the following equations

Estimation of costing

i. Total Cost (TC) = (Total variable cost + Total fixed cost).

ii. Total variable cost (TVC) = (Feed cost + Veterinary service cost + Labor cost + Medicine +Miscellaneous cost).

iii. Total fixed cost = (Depreciation of housing cost + Depreciation of equipment cost).

Here,

1. Variable cost: Variable cost includes the cost that are related to production such as feed cost, veterinary cost, labor cost, medicine cost and miscellaneous cost.

Feed cost: Feed cost includes the total amount of feed (concentrate + roughage) consumed by the cattle and multiplied by the market value of the feed.

Veterinary service cost: It includes the cost given to veterinarian for veterinary services for mastitis.

Medicine cost : It includes the cost of purchasing medicine for reducing mastitis.

Labor cost: Hired labor was considered for the study.

Miscellaneous cost: It includes electricity cost, transportation cost of rope and bags.

2. Fixed cost: Fixed cost includes depreciation of housing cost and depreciation of equipment cost.

Depreciation of housing and equipment: It was calculated on the basis of straight line method (Shiyani et al, 1989). The formula is as follow;

$$\text{Depreciation} = \left[\frac{\text{Original value} - \text{Salvage value}}{\text{Life of the house or equipment}}\right]$$

Here, life of housing was considered 15 years and life of equipment's was considered 5 years.

Profitability analysis

For Profitability analysis following equations was used:

i) $\pi = TR - TC$

ii) GM= TR-TVC

iii) BCR (Full cost basis)= $\frac{TR}{TC}$

iv) BCR (Cash cost basis)= $\frac{TR}{TVC}$

Where,

π= Profit or net return from per dairy cattle per day (Tk.).

TR= Total return.

TC= Total cost.

TVC= Total variable cost.

GM= Gross margin.

BCR= Benefit cost Ratio.

Paired t test

Paired t test also used to assess the effect of mastitis on farm profitability and milk production of the study areas.

Results

Socio-economic characteristics of the farmer

Several socio-economic status of the farmers such as age, education, family size occupation, monthly income, experience of farming, training, credit, herd size were calculated.

Table 1. Socio-economic characteristics of the sample farmers (N=40)

Parameter	Category	Frequency	Percentage (%)
Education	Primary	8	20
	Secondary	22	55
	HSC and Above	10	25
Family size (Number)	Upto 5 (Small)	16	40
	6-8 (Medium)	17	42.5
	Above (Large)	7	17.5
Monthly income (BDT)	20000-35000	12	30
	36000-50000	22	55
	Above 500000	6	15
Experience of farming (Years)	0-10	27	67.5
	11-20	6	15
	21-30	7	17.5
Training	Yes	32	80
	No	8	20
Credit	Yes	33	82.5
	No	7	17.5

Note : Training , Credit : Dummy variable , Yes =1, No=0.

Source: Field survey, 2023.

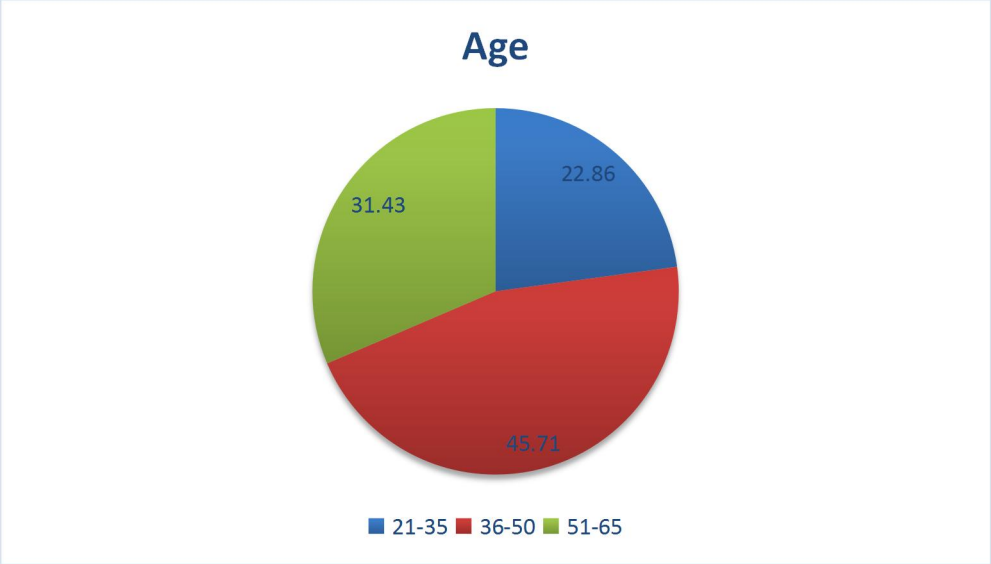

Figure 3. Age of Dairy Farmers.

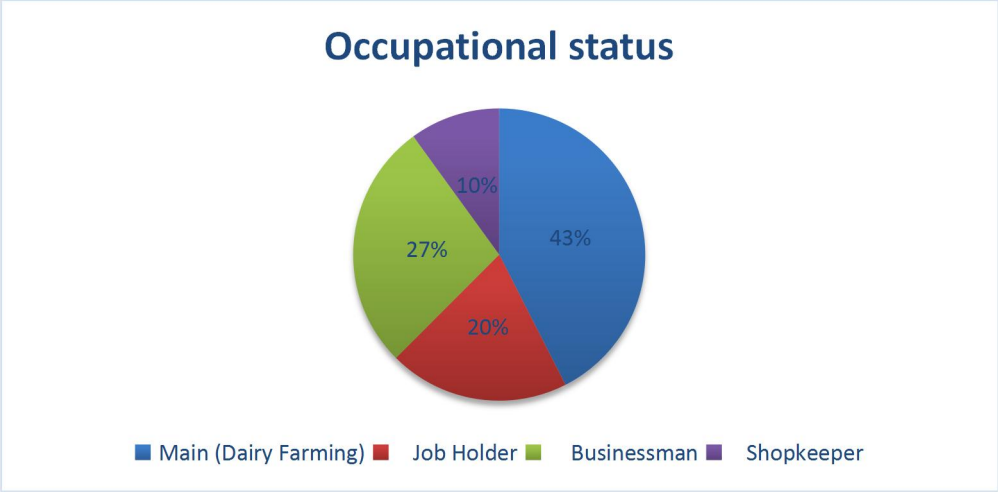

Figure 4. Occupational status of Dairy Farmers.

Age of the farmers

From Figure 3 it is seen that majority of the farmers 45.71% were in between age group (36-50) and only 31.43% of the farmers were in between age group (51-65) and 22.86% farmers were in the group of (21-35) where average age of the farmers were 41 years indicating that the farmers related to dairy cattle production are adults.

Educational status

From Table 1 it is seen that 20% of them had primary schooling. 55% of the farmers had completed secondary schooling and 10% farmers were HSC pass or more where 8% of the farmers had completed their primary schooling.

Family size

The study shows that most of the farmers 42.5% had medium family size (6-8 members) where 40% of the farmers had small family size (up to 5 members) and 7% of the farmers had large family size (above 9 members). Average family size was 6.23. As a result most of the time they have to undergo hard labor to support their family financially.

Occupational status

According to (DLS, 2021) almost 70% of the people in Bangladesh directly 20% and indirectly 50% depends on livestock for their livelihood. Most people in rural and peri urban area depends on agriculture and livestock for their livelihood. From Figure 4 it is seen that 42.5% of the respondents were dairy farmers and 57.5% others.. Among others, although majority of the respondent were businessman (27.5%) , jobs (20%) and shopkeepers (10%) , but they mainly depends on dairy farming for their income generation.

Monthly income

From Table 1 it is observed that most of the farmers were middle class family as average monthly income was Tk. 41415.00. Almost 30% of the farmers had their monthly income in between (Tk. 20000-35000) where 55% farmers had their monthly income in between (Tk. 36000-50000). Only 15% farmers had monthly income above Tk. 50000.

Experience of farming

Experience plays a vital role in dairy cattle farming. From Table 1 it is seen that 67.5% of farmers had farming experience in between (0-10) years and average farming experience was 13.5 years. Almost 15%% of the farmers had farming

experience in between (11-20) years and 17.5% farmers had farming experience in between (21-30) years.

Training

Table 1 shows that 80% farmers had received training related to livestock and their management and have better outcome compared to other 20% farms who didn't attend any training program on dairy farming..

Credit

Table 1 shows that 82.5% farmers had received credit compared to other 17.5% farms who had not received any credit.

Cost and Return Analysis of Farm

For profitability analysis both variable cost (feed cost, labor cost, veterinary cost, medicine cost etc.) and fixed cost (depreciation of housing and equipment's) were calculated as total cost. Only milk sale was calculated as total return.

Table 2. Cost and Return of per dairy cattle per day before and after mastitis (N=40)

Cost items	**Before Mastitis (Tk.)**	**After mastitis (Tk.)**
Feed cost	432.50±89.55	350±93.37
Labor cost	21.51±9.57	21.51±9.57
Medication cost	0	2277±76
Veterinary cost	0	58.40±80.72
Additional cost	392.50±97.11	412.50±97.11
Total variable cost (TVC)	578.26±211.45	2721.42± 1887.65
Depreciation of housing	2.75±6.28	2.75±6.28
Depreciation of equipment's	2.51±6.29	2.51±6.29
Total fixed cost (TFC)	5.26±12.55	5.26±12.55
Total cost (TVC+ TFC)	583.52±214.30	2726.68±1890.28
Total return		
Milk selling	1473.13±404.66	1043±478.97

Source: Field survey, 2023.

Table 2 presents that before mastitis the feed cost was Tk. 432.50 ± 89.55. Total variable cost were Tk. 578.26±211.45 per cattle per day which is almost 99.14% of total cost and total cost which was Tk. 583.52±214.30 per cattle per day.

Fixed cost in dairy farming comprise of depreciation on housing cost and equipment's cost. From Table 2 depreciation of housing and equipment's were Tk. 2.75±6.28 and Tk. 2.51±6.29 respectively. Total fixed cost were Tk. 5.26±12.55 per cattle per day which is (3.05%) of total cost.

Return in dairy farming is mainly generated from selling of milk. The cattle that produced more milk results in higher return and makes the farm more economic. From Table 2 it is seen that total return from the farm was Tk.1473.13 ± 404.66. Average milk production per cattle per day was 20.62 liters. This is the condition when the animal is fully healthy.

But as mastitis is an economic diseases, so it hampers the farm drastically. When mastitis attacks the animals, it decreases feeding intake, produces less milk and the cost of veterinarian and medicines also increases.

From Table 2, it is seen that after mastitis the feed cost Tk. 350 ± 93.37 where mediciation cost and veterinary costs are 2277±76 and 58.40±80.72 Tk. respectively. Total fixed costs are considered as same. But total variable costs are Tk. 2721.42± 1887.65 and total cost are Tk. 2726.68±1890.28. The total return from the farm is Tk. 1043±478.97 . Average milk production per cattle per day was 14.62 liters after occurring mastitis.

Profitability analysis

Table 3. Profitability of per dairy cattle per day before and after mastitis

Parameters	Before mastitis (Tk.)	After mastitis (Tk.)
Total cost (TC)	583.52±214.30	2726.68±1890.28
Total Return (TR)	1473.13±404.66	1043.25±478.97
Gross Margin (GM)	894.37±450.23	-1678 ±2008.46
Net Return (Profit)	889.61±451.91	-1683.17 ±2008.46

Source: Field survey, 2023.

Measuring farm profitability is very important for sustainability of the farm. Farm income depends on amount of milk production per cattle per day and amount of milk sale with a reasonable price. Decreased milk production has a direct effect on the profitability of a farm.

Profitability of a farm can be calculated by calculating gross margin, net return and BCR. From Table 3 it is observed that gross margin was Tk. 894.37±450.23 before mastitis and Tk. -1678 ±2008.46 after mastitis. Net return was Tk. 889.61±451.91 indicating the daily profit of farm per cattle before mastitis. But after mastitis, net return is Tk. -1683.17 ±2008.46 which is genuinely not profitable for the farm.

Benefit Cost Ratio Analysis (BCR)

BCR is the ratio of total return and total cost. Figure 5 represents BCR of cash cost and BCR of full cost basis for per dairy cattle per day before and after mastitis.

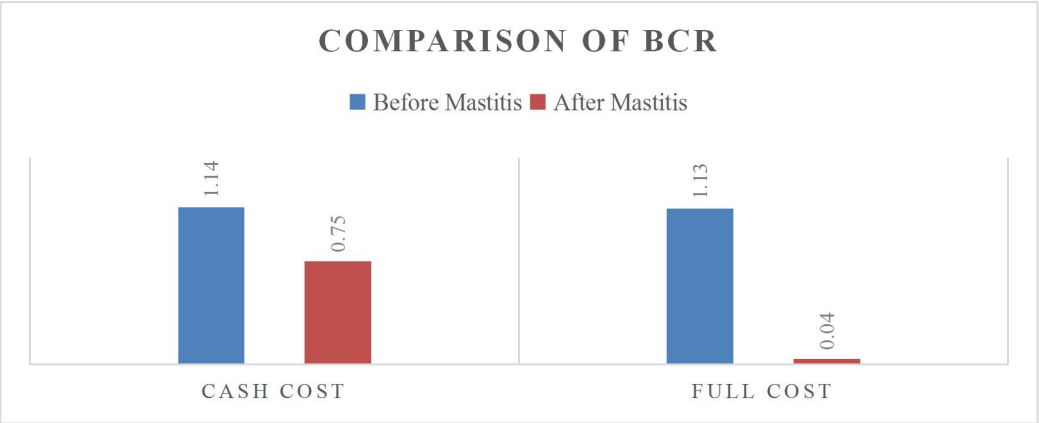

Figure 5. Comparison of BCR Cash cost and Full cost before and after

Benefit cost ratio (cash cost basis) and Benefit cost ratio (full cost basis) were 1.14 and 1.13, respectively that indicates if the farmer invest Tk. 1.0 in dairy farming he will get return of Tk. 1.13 and Tk. 1.14 for cash cost and full cost basis, respectively. However, BCR 1.13 indicates that dairy farming is still economically profitable in the study area when the mastitis was not occurred. But after occuring mastitis BCR full cost 0.04 and BCR cash cost 0.75. It indicates that if the farmer invest Tk. 1.0 in dairy farming he will get return of Tk. 0.75 and Tk. 0.04 for cash cost and full cost basis, respectively.

Paired t test

Table 4. Paired t test for comparing net return and milk production (N= 40)

Variable Pair	Mean difference	Std. Error	Std. deviation	95% Confidence Intervals		T	d.f	Sig(2-tailed)
				Lower	Upper			
Net Return before mastitis - Net Return after mastitis	-429.875	41.45	262.1325	-513.709	-346.041	-10.37	39	0000
Milk production before mastitis – milk production after mastitis	-6	0.61	3.83	-7.22	-4.77	-9.91	39	0000

It is seen from Table 4 that the difference of the net return before and after mastitis is Tk -429.875 which is statistically significant (P<0.001). Again the difference of milk production before and after mastitis is -6 which is statistically significant (P<0.001).

Risk factors of Bovine Mastitis

Animal level factors - Age of the animals, parity, lactation yield and farm related factors – stocking density, ventilation, farm hygiene condition and hygiene before and after milking are considered and the result is presented below :

Table 5. Risk factors associated with bovine mastitis

Parameter	Category	Frequency	Percentage (%)
Age of the cattle(Years)	1-3.5	11	27.5
	4-6	17	42.5
	7-10	12	30
Parity (Number)	1-3	7	17.5
	4-5	29	72.5
	6-7	4	10
Lactation yield (Litter)	10-19	14	35
	20-29	21	52.5
	30-39	5	12.5
Ventilation	Poor	30	75
	Medium	7	17.5
	Good	3	7.5
Stocking density	High	20	50
	Medium	13	32.5
	Low	7	7
Hygiene of farm	Poor	30	75
	Medium	9	22.5
	Good	1	2.5
Hygiene before	Poor	19	47.5
And After milking	Medium	19	47.5
	Good	2	5

Source : Field Survey 2023

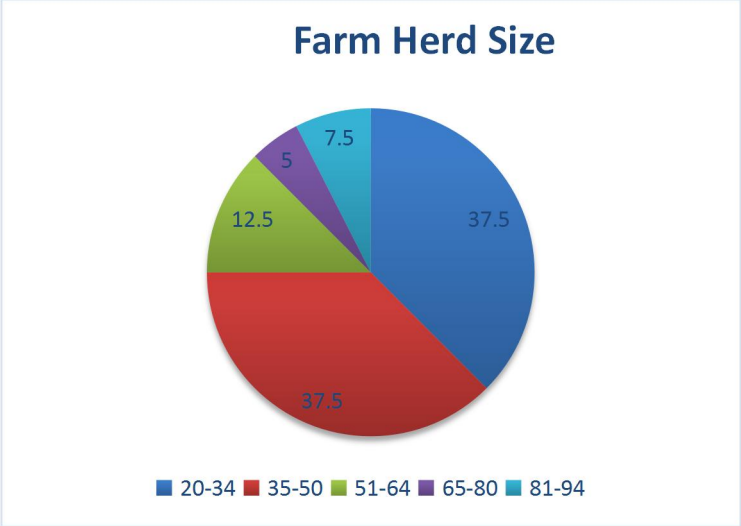

Figure 6. Herd size of the farms

Age of the cattle

From the table 5 it is seen that 27.5% prevalence found at the age of 1-3.5 years 42.5% mastitis occurred at the range of 4-6 years , where at the range of 7-10 years, it is 30% .

Parity of the cattle

17.5% mastitis occurred at the range of 1-3 parity, 72.5% occurred at 4-5 parity and 10% occurred at 6-7 parity.

Lactation yield

10-19 liter milk was produced by 35% dairy cow, where 52.5% cow produced 20-29 liter milk and 12.5% cow produced 30-39 liter milk.

Ventilation

At 75% farm , ventilation was poor, where at 17.5% farm it was medium and at 7.5% farm its good in condition.

Stocking density

At 50% farm ,the stocking density of the farm was high, where at 32.5% farm it was medium and at 17.5% farm it was low and good in condition.

Hygiene of the farm

It includes floor drainage, cleanliness of the farm. At 75% farm, the hygiene of the farm of the farm was poor, where at 22.5% farm it was medium and at 2.5% farm it was good in condition.

Hygiene of udder before and after milking

At 5% farm ,the measures of hygiene (washing and drying) were taken where at 47.5% farm they used only water before and after milking and at 47.5% farm they clean the udder with water only before milking, not after milking.

Herd size of sample farmers

Figure 6 shows that 37.5% of the farmers had (20-34) cattles per farm where 37.5% of the farmers had herd size in between (35-50) cattles and (51-64) cattles in 12.5% (65-80) cattles in 5% farm and (81-94) cattles in 7.5% farm respectively.

Discussion

Socio-economic status of dairy farmers

In the study area, only 45.71% of the farmers were in between age group (36-50) where average age of the farmers were 41 years which is similar to Quddus, (2013). They found that most of the farmers (42%) were above 45 years old and average age of the farmers were 49 years. 55% of the farmers had completed secondary schooling that didn't agree with A. Quddus,(2018). It showed that most of the farmers were illiterate and had completed their primary schooling. The study shows that most of the farmers 42.5% had medium family size (6-8 members). Average family size was 6.23. A. Quddus, (2018) also found that most of the family size was 2 to 7 persons with an average family size of 5.1. Almost 42.5% of the respondents were dairy farmers and 57.5% others. Most of the farmers were middle class family as average monthly income was Tk. 41415.00. Almost 55% farmers had their monthly income in between (Tk. 36000-50000). Average farming experience was 13.5 years which is close to Quddus, (2013). They had found that average farming experience of the dairy cattle farmers were 11 years. 80% famers had received training related to livestock and almost 82.5% famers had received credit compared to other 17.5% farms who had not received any credit.

Economic analysis

Cost Return Analysis

Dairy cattle farming is highly profitable business. In dairying, farmers generate income either from sale of farm products and by-products also through the sale of surplus animals. Cost in dairy farm includes feed cost, labor cost, medication cost, veterinary cost, and miscellaneous cost. Among the costs feed cost is the major cost. Dairy farming creates employment opportunities as it requires both family labor and hired labor which is the second most major cost. Miscellaneous costs included electricity cost and AI cost. Veterinary cost includes veterinary service cost.

Medication cost in dairy farming is comparatively high because crossbred cattle are more susceptible to variety of diseases than local breed (S. Barua et al., 2018).

Total variable cost were Tk. 578.26 ± 211.45 per cattle per day which is almost 99.14% of total cost and total cost per cattle per day was Tk. 583.52±214.30. Datta et al., (2019) also found that total variable costs were 94.3% of the total cost. Return in dairy farming is mainly generated from selling of milk. The cattle that produced more milk results in higher return and makes the farm more economic. Average milk production per cattle per day was 20.62 liters. Begum et al., (2017) found that milk production performance of cattle was 13.11 liters per cattle per day in Bangladeshi climatic condition when the animal is fully healthy.

Profitability Analysis

Gross margin was Tk. 626.62±381.82 before mastitis and Tk. -2076.92±2001.27 after mastitis. Net return was Tk. 621.36±381.69 indicating the daily profit of farm per cattle before mastitis. But after mastitis, net return is Tk. -2082.18 ±2003.27 which is genuinely not profitable for the farm. Here total cost of farming per cattle per day was Tk. 851.77 ± 129.92 and daily return from the farm was Tk. 1473.13±404.66 per dairy cattle per day. As total return is higher than total cost the farmers can generate a healthy amount of income from dairy farming when there was no mastitis in cattle. But when mastitis occurred , then the total cost was 3125.43±1883.79 Tk. and total return was 1043±478.97 Tk.. It is clearly seen that the total cost is much higher than the total return generating by only milk selling. As a result, it does not make the farm economically stable.

BCR

Benefit cost ratio (cash cost basis) and Benefit cost ratio (full cost basis) were 1.14 and 1.13, respectively. Ahmed et al., (2017) also found that the BCR of dairy cattle was 1.85. The reduced BCR may be due to decrease in milk price and increased concentrate feed cost throughout the country because of the recent pandemics as mentioned by Rahman & Chandra Das, (2021). But after occurring mastitis BCR full cost 0.04 and BCR cash cost 0.75.

Paired t test

The paired t test revealed that the difference of the net return before and after mastitis is statistically significant. Again the difference of milk production before and after mastitis statistically significant .

Risk factors associated with bovine mastitis

42.5% mastitis occurred at the range of 4-6 years , unlikely. Bari et al., (2016) found that with the advancing age the prevalence of mastitis increased.. Almost 72.5% occurred at 4-5 parity which is similar to the results reported by Zone & Seyoum, (2022) where cows with moderate parity were more susceptible to mastits than cows with lower parity and higher parity. At 75% farm , ventilation was poor, At 50% farm ,the stocking density of the farm was high, where at 32.5% farm it was medium and at 17.5% farm it was low and good in condition. Zone & Seyoum, (2022) found that prevalence of the mastitis was proportional to the stocking density. At 75% farm, the hygiene of the farm was poor, which agrees with Bari et al., (2016) where they found that under poor floor drainage quality the prevalence of mastitis was higher. At 5% farm ,the measures of hygiene (washing and drying) were taken where at 47.5% farm they used only water before and after milking and at 47.5% farm they clean the udder with water only before milking, not after milking. Zone & Seyoum, (2022) also reported that washing udder without drying caused mastitis than washing and drying.Like the result of herd sizes, Bari et al., (2016) also found that the prevalence of clinical mastitis became lower when the herd sizes are higher. Poor hygiene practice and disease control program in small herds may be responsible for this.

Limitations

The number of bovine mastitis cases in this study was small (40 cases). Inclusion of retrospective mastitis cases was also a limitation as information of retrospective cases may not be as accurate as fresh cases. The diagnosis of mastitis was only based on clinical signs.

Conclusion

The study demonstrates the socio-economic characteristics, farm profitability before and after bovine mastitis and risk factors of bovine mastitis of the dairy cattle farmers in Chattogram district. When mastitis occurs the milk production decreases almost 1.40 times and net profit decreases 1.42. In order to make the farm more profitable it is recommended to provide required spaces and makes the ventilation good, considered the age and parity of the animal and maintain hygiene before and after milking; and biosecurity of the farm. This will make the farm more economically viable and the farmers will get maximum benefits and the sufferings of the animals will be reduced.

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Biography

I am Sumsoon Naher Tuly, daughter of MD. Billal Hossain and Hasina Begum. I passed my SSC from Mathripith Govt. Girls High School in 2014 (GPA 5.00) and passed my HSC from Chandpur Govt. College, Chandpur in 2016 (GPA 5.00). Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chattogram Veterinary and Animal Sciences University. In future I would like to work as a veterinary practitioner. I have keen interest in molecular biology, microbiology and surgery. I would like to do research in near future.