Study on Dairy Farm Management at Shikalbaha, Karnaphuli Upazila of Chattogram District

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ABSTRACT

The study was conducted to know the management practices of dairy farms at Shikalbaha Union, Karnaphuli Upazilla, Chattogram district, that are related to housing, feeding, breeding, milking, and disease management. The empirical data were gathered by speaking with farmers directly. The study was performed among 376 cows, of which 58.51% were milch cows, 11.97% were heifers, 14.63% were dry cows, and 14.89% were calves. It was revealed that most of the farmers in that area are young and middle-aged, and day by day they are gathering experience regarding dairy farming. All the studied area was intensively reared, where 66.66% of the floor of the farm-house was made with concrete and 33.33% of the floor of the farm-house was made with brick. It was also revealed that there was no absolute feeding practice on any farm, and most farmers prefer supplying feed 24 hours a day. About 66% of farmers cultivate Napier as fodder, 22% cultivate German, and 11% cultivate maize as fodder. It was observed that 77.78% of farmers breed their cows with artificial insemination, and 22.22% breed their cows with both artificial insemination and natural insemination. The highest milk yield of the studied area was 18 liters per day in a cow, while the lowest yield was 9 liters per day. Most of the farmers sell milk in the local market, as well as Mishti Ghor and Fulkoli. About 66.66% of farmers prefer hand milking, and 33.33% prefer machine milking. Although there was no isolation shed in that area, 77.78% of farmers have quarantine sheds on their farms. It was found that 77.78% of farms have a foot-bath, and only 44.44% of farmers keep farm records, though there are no records of individual cows on any farm. FMD, anthrax, and mastitis were found to be the most prevalent diseases in that area. In summary, this study highlights differences in management approaches for housing, feeding, breeding, milking, and disease control, shedding light on how dairy farming techniques have changed in the Shikalbaha Union. The results highlight the need for focused interventions to promote record-keeping, disease management, and consistent feeding methods in order to increase the overall sustainability and productivity of dairy businesses in the region.

CHAPTER 1

INTRODUCTION

Livestock, especially in the dairy sector, plays a crucial role in Bangladesh's economic development by providing milk, meat, and hide. Livestock, especially in the dairy sector, plays a crucial role in skin.

In Bangladesh, there are approximately 23-25 million cattle (FAO, 2021). of which 10 million are dairy cattle. Despite an increase in supply of domestically produced animal products (milk, milk products, and meat) of roughly 1.2% annually, the daily availability of milk and meat per person is only 125 ml and 106gm, respectively, compared to the needs of 250 ml and 120 g (DLS-2016). There are 164.6 million people living in Bangladesh as of today (*Worldometer*, 2020). But according to the World Bank, Bangladesh's population would increase dramatically by more than 300 million between 2000 and 2030, which is more than double the rate of population growth. To meet the expanding need for food, immediate action is necessary (*Uddin et al*., 2012). Research shows that 20% of the total population is employed in jobs related to rearing livestock and poultry (*Annon,* 2020), though there is a severe lack of livestock products like milk and meat for the huge consumers. The typical milk output of a local cow is extremely low, ranging from 300–400 lit throughout the lactation period of 180–240 days, while crossbred cows typically produce 600–700 lit per lactation lasting 210–240 days (*Mondal et al*, 2005). Due to low milk availability per person, unemployment, and the desire to become self-sufficient in milk production, there is a demand for dairy development in nations like Bangladesh. In addition, there should be more attention given to the dairy industry because this segment of livestock is heavily dependent on imports. Despite Bangladesh's enormous potential to develop its dairy industry, a significant amount of money is spent on milk and milk products imported from other countries. Lack of high- quality feeds and fodder, poor cattle breed management techniques, restricted access to veterinary care, and disorganized marketing channels are the main obstacles to dairy cattle production. A multi-modal strategy is necessary to overcome these challenges, including better farm management techniques, better access to resources, and government support for the dairy industry's sustainable expansion. Collaboration between farmers and the appropriate authorities can aid in solving these problems successfully.

Objectives of this study:

1. To assess the current state of the dairy farming operations at Shikalbaha in reference to breeding, feeding, housing, milking, marketing, and management.

2. To contrast this region's production with global production.

3.To investigate the dairy farm's distribution methods, pricing policies, and market reach in Shikalbaha union.

CHAPTER 2

MATERIALS AND METHOD

The study was conducted in dairy farms at Shikalbaha Union Karnaphuli Upazilla in Chattogram district from June to July 2023, and the dataset used in this study was obtained from nine farms in Shikalbaha, Karnaphuli. The farmers keep some records in the register book and some in memory. The survey schedule was created based on the following important factors: general information about the owner, the number of cattle, the sources of funding, the housing and feeding arrangements, the breeding arrangements, the overall management, etc. Direct interviews and on-site visits to the farms of farmers were used to gather the data. Each respondent received a brief explanation of the study's scope and objectives prior to the interview. The following steps were taken in conducting the study:

2.1 Study area:

The data were collected from nine farms in Shikalbaha union, Karnaphuli Upazila, Chattogram district.
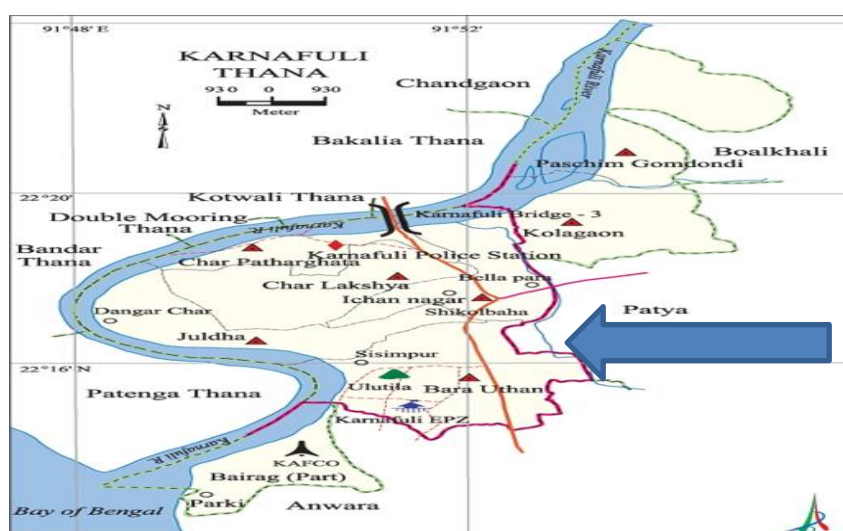
Shikalbaha union of Karnaphuli Upazilla, Chattogram

Table 1: Selected nine dairy farms in Shikalbaha union of Karnaphuli Upazilla, Chattogram

Name of Farm	Name of Farmer	Address	Farm code
Yousuf Dairy farm	Yousuf	Shikalbaha	F1
Shah Amanat dairy	Md Nur Uddin	Shikalbaha	F2
Masud Argo	Masud	Shikalbaha	F3
Bandan Dairy	Mohammad Nur	Shikalbaha	F4
As Shefa Farm	Md Jasim	Shikalbaha	F5
Sahnaj Dairy	Harun	Shikalbaha	F6
Model dairy	Yousuf	Shikalbaha	F7
Rahim dairy	Rahim	Shikalbaha	F8
Moen Dairy	Moen	Shikalbaha	F9

Table 2: Daily activities in different dairy farms

Time	Activities
5.30-6.00 am	Floor washing, removal of dung, Heat detection
6.00-8.00 am	Washing of milk utensils
8.00-10.00 am	Milking, roughage & concentrate feed supply.
10.00-12.00 pm	Bathing of animals, Grass collection
12.00-3.30 pm	Rest
3.30-5.30 pm	Washing utensils & milking
5.30-6.00 pm	Concentrate & roughage feed.
6.30-7.00 pm	Cleaning & washing of the floor, premises, dung removal
7.00-5.30 am	Rest

2.1 Data collection

The data were collected using a predefined questionnaire. The questionnaire was created keeping in mind the study's goal. The questionnaire was designed to gather the necessary data from the farmers and pinpoint the traits and economic characteristics of cows, such as their BCS score, their rearing and feeding practices, and their average daily milk production. The information was gathered via the direct interviewing technique.

2.2   Data Analysis

MS Excel-2010 was used to assemble, tabulate and analyze the acquired data in order to interpret the result. For the inquiry descriptive data such as frequency and percentage were employed**.**

CHAPTER 3

RESULT & DISCUSSION

General information of dairy farm owners

The table three shows that 44.44% farmers age ranges from 25-35 years, 33.33% farmers are 36-45 years and 22.22% from 46 or more than that age. Among the farmers 55.55% are experienced in dairy farming for 1-5 years,11.11% for 6-10 years and 33.33% more than 10 years. The observation also shows that most of the farmers in this region are male

1.Distribution by age:

Ages 25 to 35 make up the majority of farmers. This may indicate that younger people are becoming more active in farming. The 36–45 years age range also represents a significant portion, but they most likely have some experience. Although the age group above 46 is not the most numerous, it shouldn't be disregarded. Older farmers may have a lot of expertise and a deep understanding of the land.

2.Levels of Experience:

Most farmers have between one and five years of experience. This suggests that the industry has a sizable influx of new farmers or a reasonably high rate of turnover.

Table 3: General information for dairy farm owners

Farmers age(Y)	Frequency	Percentage	Experience(Y)	Frequency	Percentage
25-35	4	44.44%	1-5	5	55.55%
36-45	3	33.33%	6-10	1	11.11%
>46	2	22.22%	>10	3	33.33%

Number of animals and breeds

Table four illustrates the cow distribution across nine farms. Milch cows dominate the inventory at 58.51%, highlighting a focus on milk production. The substantial heifer count (11.97%) indicates a commitment to future milk production. Dry cows (14.63%) prepare for future calving, and calves (14.89%) represent young stock. Each farm displays unique priorities and sizes. Effective cow management strategies, tailored to these priorities, are essential for optimal farm performance.

The kind and quantity of animals on a dairy cattle farm are important variables for milk production. Milch cows are typically given priority on farms, as seen by the fact that they account for 58.51% of the total. Heifers, at 11.97%, guarantee a supply of milk producers in the future. Calves (14.89%) are the farm's future, while dry cows (14.63%) get ready for calving. This balance is crucial for sustainable dairy farming. Most of the farmers prefer crossbreeds for higher milk yield. Here in the study it was found Holstein with Jersey cross and Holstein with Sahiwal cross.

Table4: Number and type of total animals

Farm code	Total cow	Milch cow	Heifer	Dry cow	Calf
F1	25	15	2	4	4
F2	50	27	8	7	8
F3	35	13	6	10	6
F4	60	36	9	7	8
F5	38	10	7	9	12
F6	32	28	0	0	4
F7	50	35	5	7	3
F8	45	35	0	6	4
F9	41	21	8	5	7
Total	376	220	45	55	56
Percentage		58.51%	11.97%	14.63%	14.89%

Housing system

About 33.33% of the house provided half a building, and the rest of the house was a tin shed. About 100% of the farmers used intensive rearing. The study shows that about 55.55% of housing doesn't use bedding, and 44.44% of housing uses bedding in their shed. On the basis of the floor type, 66.66% of the floor of the farmhouse was brick, and 33.33% had a concrete floor.

There are two primary categories of housing for dairy cattle.

1. Stanchion barn:

A stanchion barn is a type of housing where cows are kept in close quarters on a platform and fastened at the neck. The stanchions are where the cows are milked and fed.

2. Loose housing:

In a loose housing setup, dairy cows are allowed to roam freely inside an open-type barn. Typically, one side is partially open so they can enter and exit as they want.

Hossain et al, (2004) noted that 63% of farmers offered closed houses and 63% of farmers used cemented floors in different area of Bangladesh which is nearly same to the study but due to low availability of area most of the farmers use closed house.

Table 5: Housing system

| Farm code	Housing	Type of shed	Bedding	Floor
F1	Intensive	Half building	Present	Concrete
F2	Intensive	Frequency: 3	Frequency:4	F: 3
F3	Intensive	Percentage:33.33%	Percentage:44.44%	P: 33.33%
F4	Intensive			
F5	Intensive	Tin shed	Absent	Brick
F6	Intensive	Frequency: 6	Frequency:5	F: 6
F7	Intensive	Percentage:66.66%	Percentage:55.55%	P: 66.66%
F8	Intensive			
F9	Intensive			

Feeding system

The dairy farmers use stall feeding with no grazing facilities. Milk was sucked into all of the calves. Few farmers usually offer milk to calves in bottles. Rice straw was the primary livestock feed in the research area. Eighty percent of the farmers utilized untreated straw. According to research, most dairy farmers feed their cows straw and other crop residue along with green grass (*Khan et al*., 2009). It has become clear that feeding standards based on assigned nutritive value (i.e., energy) are deceptive when unconventional feed resources are used in formulation (*Gaya et al*., 1988*; Leng and Preston*, 1976). This is because many feed resources were frequently rejected because their DE energy was insufficient to provide the energy required for the animal's production.

Table 6: Feeding practice followed by farmers

| Farm code	Total animal	Roughage(kg/day)	Concentrate(kg/day)
F1	25	200	160
F2	50	340	180
F3	35	110	120
F4	60	380	200
F5	38	135	150
F6	32	215	130
F7	50	380	280
F8	45	350	200
F9	41	280	190

Fodder cultivation

The result according to figure, most of the farmers cultivate Napier, as well as some German and Maize. Most dairy farmers identify the limited availability of good-quality fodder as their major constraint (Akbar et al., 2000). As a result, the gap between milk supply and demand in Bangladesh is large, and average milk consumption per ca-pita is much lower than in other South Asian countries such as India and Pakistan (FAO, 2010). It is found in this study that most of the farmers don't have their own land, which is like this research.
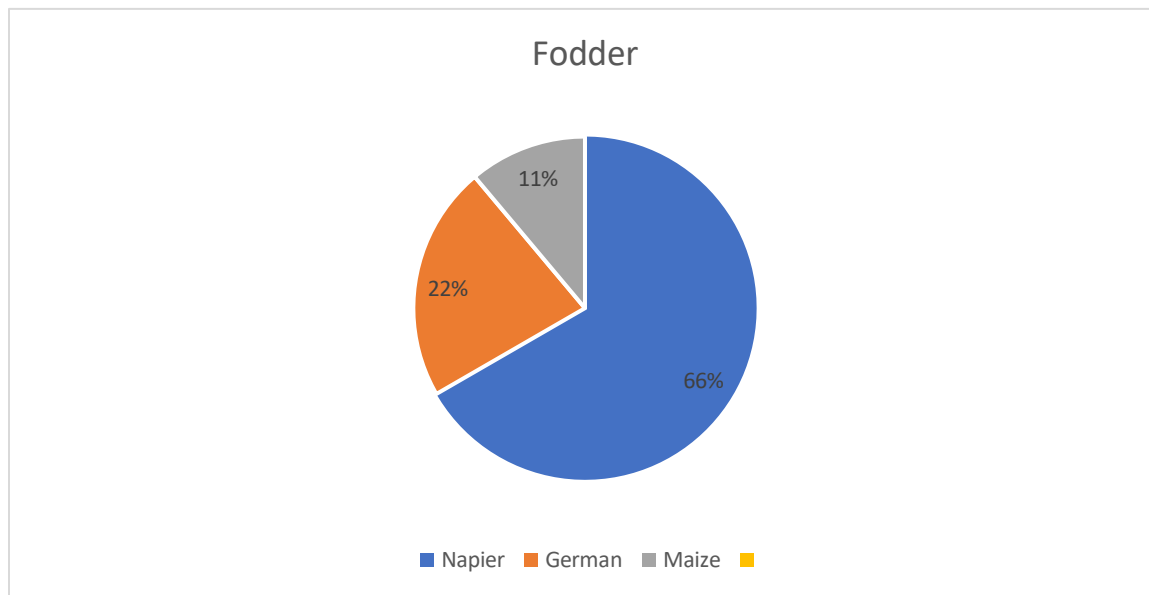
Fig 1: Different types of fodder in studied area

Breeding System

It was observed that 77.78% of the cow were inseminated by artificial insemination, 22.22% by both natural and artificial insemination in figure 2. But there was no farm founded that done only natural breeding. According to Islam et al, (2010) intensive systems have easier access to AI, it is used there more frequently *(Islam et al*. 2010). The use of AI is influenced by the accessibility of efficient services, farm distances, communication channels, and cost.
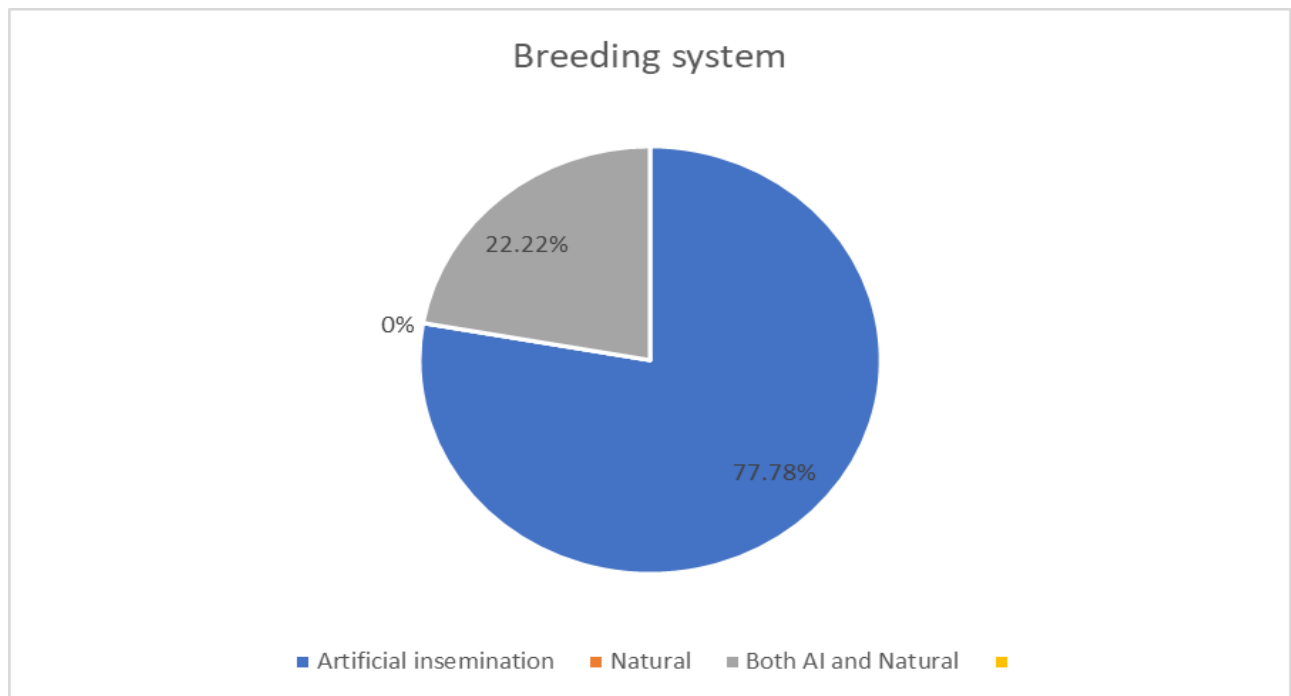
Fig 2: Breeding practice of studied far

Milk production and marketing of milk

Table seven shows that, highest milk yield per day was found 15 liter while the lowest was 8 liter per day per cow. About 66.66% farmers used hand milking and rest 33.33% prefer machine milking. Every farmer like milking twice daily. Farmers sell milk to multiple area like local market, Mishti ghor, Fulkoli etc.

Crossbreeding initiatives have significantly increased milk production in Bangladesh. Native cows used to only produce a small amount of milk. However, the nation has seen higher milk outputs per cow as a result of crossbreeding with high-yielding breeds like Holstein and Jersey. Due to this hybridization, milk quality and quantity have improved, satisfying the rising demand for dairy products. Crossbreeding has also helped small-scale farmers become more economically independent by increasing their ability to profit from milk sales. Crossbreeding has undeniably played a significant role in changing Bangladesh's milk production environment, even though there are still issues, such as preserving herd health and nutrition. In present study most of the farmers rare crossbreed because of the high production.

Table 7: Milk production and marketing of milk

Farm code	Milch cow	Milking frequency	Milking system	Average milk yield/day/cow (L)	Marketing
F1	15	2	Hand milking	15	Fulkoli
F2	27	2	Hand milking	12	Local market
F3	13	2	Machine milking	9	Mishti ghor
F4	36	2	Hand milking	11	Local market
F5	10	2	Hand milking	8	Mishti ghor
F6	28	2	Machine milking	13	Fulkoli
F7	35	2	Hand milking	16	Fulkoli, Local market
F8	35	2	Machine milking	10	Mishti ghor, Local market
F9	21	2	Hand milking	8	Local market

Overall management of studied dairy farm.

Table 5 shows the overall management of farm like isolation and quarantine facility, footbath, milk storage facility, record keeping, biogas plant etc. There was no isolation facility in any farm but 77.78% farms have quarantine facility. Almost every farm there was freezer for milk storage. 77.78% farms use footbath for visitors and doctor. About 44.44% farmers keep the individual cow records. 33.33% farmers have biogas plant. It is necessary to keep records in different parameters. for efficient operation. According to Banerjee (2007) and Mahata (1987), a typical dairy farm needs records of milk output, breeding (AI record), cattle history and pedigree, health, calving (description with calving issues if any), feed registration, and financial information (*Banarjee*,2007).

Table 8: Overall other management

Criteria	Frequency	Percentage
Isolation	0	0%
Footbath	7	77.78%
Milk storage	9	100%
Record keeping	4	44.44%
Quarantine	7	77.78%
Biogas	3	33.33%

Vaccination and Deworming :

The study revealed that about 55.55% of farmers give vaccines against black quarter, 66.665 against hemorrhagic septicemia, and 100% against FMD (Table 9). On every farm, there was awareness about worms, and about 100% of the farmers maintained a deworming schedule.
For their cattle, several dairy farms in Bangladesh normally follow a semi-annual deworming program. To properly control internal parasites, anthelmintic treatments must be given every six months. Based on farm-specific conditions and veterinary advice, the timing may vary slightly. For

the purpose of preserving the health of the cattle and avoiding drug resistance, it is essential to use a balanced strategy that takes into account the age, physical condition, and species of prevalent parasites. In Bangladeshi dairy farms, routine deworming in conjunction with good management techniques helps to ensure maximum milk production and overall animal health.

Table 9: Vaccination and Deworming

	Frequency	Percentage
Black Quarter	5	55.55%
Hemorrhagic septicemia	6	66.66%
FMD	9	100%
Deworming	9	100%

Disease prevalence

In this study, Table 10 shows that 88.89% of farms were facing FMD, 77.78% were facing anthrax, 66.67% were facing mastitis, 33.33% were facing black quarter, and 55.55% were facing milk fever.

According to studies by Shamsuddin et al. (2007) and Gaffar et al. (2007), there were three most important diseases in terms of frequency of occurrence and severity of prevalence: foot-and-mouth diseases (FMD), followed by anthrax and mastitis (*Shamsuddin et al*., 2007; *Gaffar et al*., 2007).

Table 10: Disease prevalence in the studied area

Disease	Frequency	Percentage
FMD	8	88.89%
Anthrax	7	77.78%
Mastitis	6	66.67%
Black quarter	3	33.33%
Milk fever	5	55.55%

Problems faced by dairy farmers:

High Feed Costs: Profits may be impacted by rising feed costs. Farmers can get around this by looking into alternative feed sources such crop waste, agro-industrial byproducts, and better pasture management.

Lack of High-Quality Breeds: Local breeds of low quality restrict milk output. Genetics can be improved through artificial insemination and crossbreeding with high-yielding breeds.

Outbreaks of illness: Illnesses as mastitis and foot-and-mouth disease (FMD) can injure livestock

and lower output. Biosecurity measures, routine veterinary care, and immunizations are crucial.

Market volatility: Varying milk prices might make money unstable. This can be reduced by joining dairy cooperatives, expanding into value-added dairy products, and negotiating reasonable rates with processors.

Limited access to credit is available for investments in infrastructure and new farming techniques. Farmers might look for government assistance and microfinance solutions.

Limitations of study:

Dairy farm management study in Shikalbaha encountered limitations, primarily stemming from a small sample size. This restricted the generalizability of the findings to the broader dairy farming community. Additionally, seasonal variations in data collection pose challenges, as they may not fully represent year-round practices. Limited access to comprehensive historical farm records and potential response bias from participants added complexity to the accuracy of the data. Despite these constraints, the study provided valuable insights into local dairy practices. Future research should consider larger and more diverse samples to yield more representative and robust results in the context of Shikalbaha's dairy industry.

Conclusion

The main objective of dairy farming is to get the ultimate benefit. It is impossible to produce more with fewer facilities. In my study, it was revealed that most of the farmers don't follow standard husbandry practices in every aspect, like housing, feeding, bio-security, and health care management. According to the study, most of the farmers don't keep the actual records of cows regarding total farming, like production records, financial records, health records, management practice records, reproductive records of cows, etc.

In the case of dairy farming, farmers are facing a lot of problems, such as high prices of concentrate, scarcity of feed and fodder, a lack of fodder land, and a lack of perfect scientific knowledge on farming. So, it is necessary to take proper initiative to increase production and support the national economy.

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BIOGRAPHY

I am Saidul Karim Imran. I am a student of 23rd batch and an intern veterinarian under faculty of veterinary medicine in Chattogram Veterinary and Animal Sciences University. I have passed Secondary School Certificate (SSC) in 2014 followed by the Higher Secondary Certificate(HSC) in 2016. I come from Chandanaish, Chattogram. In future i would like to work as a veterinary practitioner and do research on clinical animal disease in Bangladesh.