

# **A study on milk production and management practices of household and commercial dairy farms in Patiya Upazilla, Chattogram.**



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## Abstract

The current study was carried out to determine the current status of various dairy farms, including general information, feeding, rearing, housing, milking, health management, ventilation, waste management system and milk production. According to this point of view, empirical data were gathered through the use of a predefined questionnaire. The research was carried out at PatiyaUpazilla in Chattogram district, and a month-long survey was conducted on 15 farms (smallholdings to commercial). Direct contracts with farmers were used to collect the data. According to the findings, 65 percent of farm owners raise crossbred cattle and 35 percent raise indigenous cattle. Even though dairy cattle owners encounter challenges, the analysis revealed opportunities, applied to small dairy farmers. Significant association was observed between average milk yield with factors like feed type, ventilation and waste management system.

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**Keywords:** Crossbred, lactation, indigenous cow, milk production performance.

## **Chapter 1**

### **Introduction**

Bangladesh has 24 million cattle, 6 million of which are dairy cattle, both indigenous and crossbred (DLS-2018). Cattle are primarily kept in rural areas for draught purposes. A cow for milk production is only available to a small number of farmers. Maximum cattle are nondescriptive forms that do not belong to any one breed and are referred to as indigenous cattle. They are smaller in size and have a lesser milk production capability than exotic varieties. With the proliferation of artificial insemination procedures across the country, the number of crossbred cattle is increasing. The typical milk yield of a local cow is quite low, ranging between 300 and 400 liters per lactation period of 180 to 240 days. Crossbred cows typically produce 600 to 800 liters per lactation of 210 to 240 days (Islam, 1992). Higher milk production is typically reported in the third or fourth lactation. Average body weight, milk yield, calving interval, and other economic features of milk-producing animals are among the most important. Because of the increased milk production, crossbred cows are in high demand these days. When compared to an improved breed of cattle, indigenous cattle produce less milk (Hossain et al., 1982).

Bangladesh has a severe scarcity of livestock products such as milk, meat, and eggs. Domestic milk demand has been increasing at a quicker rate than domestic milk output. The availability of milk is only 33.95ml per head per day, while the maximum daily requirement is roughly 250ml milk (DLS- 1991). This is due to native stock's inferior genetic background and a lack of essential nourishment in their diet. As a result, the Bangladesh government has prioritized the development of dairying at the farmer level in order to improve milk supply from small dairy farms.

Bangladesh's cattle feeding methods are appalling. There is no universally accepted feeding system. To meet the nutrient requirements of the cows, the farmers lack scientific expertise and do not follow any feeding standards. These animals are primarily housed in stalls with limited grazing on the roadside and embankment slope; their principal foods are fallow land and paddy straw. These animals' husbandry practices and health care are deplorable (Jabbar and Raha., 1984). Stall-feeding is performed due to a lack of adequate grazing pastures, and cattle are occasionally tethered on roadside ditches and unused land. The challenge of feeding dairy calves is complicated by the seasonal and changeable supplies of rice straw and green grass

(Rahman et al., 1998). Dairy probability is directly proportional to milk output, which is commonly impacted by dairy cows' poor reproductive performance (Rahman et al.; 1995).

Age at 1st calving service, parturition at 1st service & conception interval, daily milk supply, stage of lactation, and number of lactations were all factors that contributed to the cow's reproductive and productive efficiency. Cross-bred cows' reproductive success may differ from that of traditional ethnic cows in different geographical places with adverse environmental circumstances (Garcia 1988, Jahan et al., 1990). Several factors influence householder cattle's milk output, with parity playing a significant part in lactation cows' production performance. Various scientists in Bangladesh have conducted a modest number of research studies to boost milk production under village management conditions; however, further research is needed. As a result, the current study aimed to assess the production performance of smallholder nursing cows based on nutritious grass supply, ventilation and rearing wash management system (WMS) with the following goals:

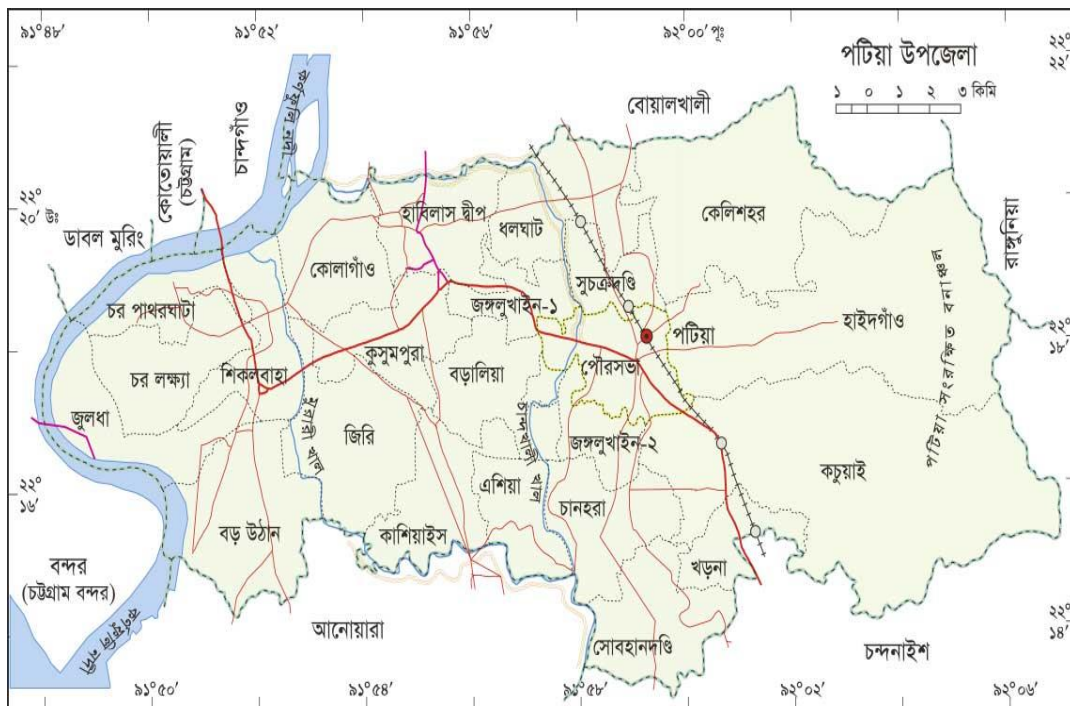
- i To describe the smallholder's milking cattle's farming state, variety status, and care coordination.
- ii To impact the success of indigenous and crossbred lactation cows in parameters of dairy production under village management conditions.

## Chapter 2

### Materials and method

#### 2.1 Study area

In September, the study was performed in dairy farms in PatiyaUpazilla, Chattogram district, with the data set coming from individual and commercial household cattle farms. Farms were chosen primarily in the Kelisahar, Haidgaon, Junglekine, and surrounding areas. These locations yielded data on 15 indigenous cows and 20 crossed breeds. Data for milk production and a number of lactations were gathered from the farmers through an interview with them. The farmers keep records in the register book and some in memory and account of the operation of their animals. The information for individual lactating cows was acquired from the farmers in this study, same like prior survey activities.





### **2.1 Data collection:**

A preset questionnaire was used to collect data. The questionnaire was created in accordance with the study's goals. The questionnaire was created in order to collect the necessary information from the farmers as well as to identify the characteristics of indigenous cows. The questionnaire (Annex 1) includes information on the economic characteristics of indigenous cows, such as BCS score, rearing system, feeding system, and average milk supply per day (lit). Farmers' data was gathered through direct questioning.

### **2.3. Data analysis:**

All of the original information was imported into a Microsoft Excel 2013 worksheet. Analysis Toolpack from Excel was used to examine descriptive statistics for independent parameters. Stata software (version 13.1) was used for further statistical studies.

## Chapter 3

### Results and Discussion

#### 3.1 Average milk production of different Farms

The type of feed supply, ventilation of farm, waste management system and Average milk production of different farms is represented in Table 3.1. From the Table it is seen that the indigenous cows did not have any nutritious grass supply and proper ventilation. The waste management system of the indigenous cow farm's are poor. As a result the average milk production of indigenous cow are less than 4 L. The highest milk production was 3.49 L and the lowest one was 1.9 L. On the other hand the cross breed farm's have proper nutritious grass supply and good ventilation. The waste management system of the farms were in good condition. The average milk production rate of a crossbred cow is 9.48 L. The highest milk production is seen 11.41 L and the lowest one is seen 7.21 L. In this table we clearly see that grass supply, proper ventilation and waste management system has a great importance in the milk production rate.

**Table 3.1: Average milk yield yield list**

Type	Grass supply	Ventilation	Waste Management System	Average milk yield (litre)
Ind 1	No	Nothing	No	2.22
Ind 2	No	Nothing	No	2.63
Ind 3	No	Nothing	No	3.39
Ind 4	No	Nothing	No	2.19
Ind 5	No	Nothing	No	2.94
Ind 6	No	Nothing	No	2.48
Ind 7	No	Nothing	No	1.96
Ind 8	No	Nothing	No	2.06
Ind 9	No	Nothing	No	2.33
Ind 10	No	Nothing	No	2.79
Ind 11	No	Nothing	No	1.9
Ind 12	No	Nothing	No	2.73
Ind 13	No	Nothing	No	2.89
Ind 14	No	Nothing	No	3.49
Ind 15	No	Nothing	No	2.7
Indigenous				2.581
Cross 1	Yes	Good	Yes	9.23

Cross 2	Yes	Good	Yes	9.09
Cross 3	Yes	Good	Yes	10.37
Cross 4	Yes	Good	Yes	9.84
Cross 5	Yes	Good	Yes	8.69
Cross 6	Yes	Good	Yes	10.75
Cross 7	Yes	Good	Yes	7.21
Cross 8	Yes	Good	Yes	8.29
Cross 9	Yes	Good	Yes	7.8
Cross 10	Yes	Good	Yes	8.59
Cross 11	Yes	Good	Yes	10.44
Cross 12	Yes	Good	Yes	9.9
Cross 13	Yes	Good	Yes	10.31
Cross 14	Yes	Good	Yes	11.34
Cross 15	Yes	Good	Yes	7.6
Cross 16	Yes	Good	Yes	9.82
Cross 17	Yes	Good	Yes	8.78
Cross 18	Yes	Good	Yes	8.81
Cross 19	Yes	Good	Yes	11.41
Cross 20	Yes	Good	Yes	11.2
Crossbreed				9.48

### 3.2 Association between milk yield and grass supply

Association between milk yield and grass supply of different farms is shown in Table 3.2. From our study it was observed that the nutritious grass supply was shown to be the most suitable for daily milk yields of  $2.58 \pm 0.48$  and  $9.47 \pm 1.26$  liters for indigenous and crossbred cows, respectively. The current estimate may not be adequate to compare with other studies because the condition was performed at a certain point in time. We know that if the p value is less than .05 then the two variables are significantly related with each other. Here the p value is .001. So grass supply has a very significant relation with milk production.

Cattle grazing natural pasture lose body weight unless fed with a protein concentrate, with cyclic ovarian activity halting when cows lose 20-30 percent of their mature weight due to undernutrition (Topps and Oliver 1993). The most important factor influencing the length of post partum oestrus in cows grazing tropical rangeland has been discovered to be an inadequate level of nutrition (Topps and Oliver 1993). According to the findings, 40 percent of farmers used a pasture-based grazing strategy, while 60 percent used the cut-and-carry method. Grazing systems have little promise for dairy production intensification. Farmers are not growing any fodder in this study. Because of land scarcity, seed/cutting scarcity, and lack of information, the most significant restraints in fodder cultivation are scarcity of land, seed/cutting scarcity, and lack of expertise.

**Table 3.2: Association between milk yield and grass supply:**

Variable	Co variable	Average milk yield		
		Mean $\pm$ Standard deviation	Standard error (standard deviation/ $\sqrt{n}$ )	P value
Feed type	Grass	9.47 $\pm$ 1.26	0.28(n=20)	0.001
	No grass	2.58 $\pm$ 0.48	0.12(n=15)	

### 3.3 Association between milk yield and ventilation

In this study we can see that ventilation also plays an important role in the milk production. The proper ventilation supply was shown to be the most suitable for daily milk yields of 2.58 $\pm$ 0.48 and 9.47 $\pm$ 1.26 liters for indigenous and crossbred cows, respectively. We know that if the p value is less than .05 then the two variables are significantly related with each other. Here the p value is 0.001. So proper ventilation has a very significant relation with milk production.

Ventilation also presumably reduced thermal load in the ventilated strip under the roofed area vs. the unventilated part of the same area (Berman et al., 1985). Different thresholds of heat stress for production traits in dairy cattle were reported using different TI definitions and dairy populations (Dikmen and Hansen, 2009; Boonkum et al., 2011; Brügemann et al., 2011).

**Table 3.3: Association between milk yield and ventilation:**

Variable	Co variable	Average milk yield		
		Mean $\pm$ Standard deviation	Standard error (standard deviation/ $\sqrt{n}$ )	P value
Ventilation	Good	9.47 $\pm$ 1.26	0.28(n=20)	0.001
	Nothing	2.58 $\pm$ 0.48	0.12(n=15)	

### 3.4 Association between milk yield and waste management system(WMS)

The proper waste management system was shown to be the most suitable for daily milk yields of  $2.58 \pm 0.48$  and  $9.47 \pm 1.26$  liters for indigenous and crossbred cows, respectively. We know that if the p value is less than .05 then the two variables are significantly related with each other. Here the p value is 0.001. So waste management system has a very significant relation with milk production. Without proper cleaning there is high chances of getting health diseases which will affect the production. In our country, low average, efficient vaccines against rinderpest, infectious bovine pleuropneumonia, and local strains of foot-and-mouth disease are frequently accessible. Regular immunisations can help prevent sporadic or regional infections including anthrax, blackleg, and haemorrhagic septicaemia, however vaccinations for these diseases are not always of high quality or uniformly available. The expenses of some immunizations may outweigh the promised advantages (McCauley, 1983). Deworming was done on a regular basis in the current investigation. Disease is a significant stumbling block for all types of livestock production, but particularly for calves (Perry et al., 1984), who are prone to respiratory and gastrointestinal disorders. According to the findings, 30% of the calves had one or more of the illnesses listed above. Chronic disorders like dermatophilosis reduce milk production and increase mortality in people of all ages (Oduye, 1975).

**Table 3. 4: Association between milk yield and waste management system(WMS):**

Variable	Co variable	Average milk yield		
		Mean $\pm$ Standard deviation	Standard error (standard deviation/ $\sqrt{n}$ )	P value
WMS	Yes	$9.47 \pm 1.26$	0.28(n=20)	0.001
	No	$2.58 \pm 0.48$	0.12(n=15)	

## **Conclusion**

The majority of small holder farmers in the PatiyaUpazilla (Chattogram) region are landless, according to a study on farming status and cow milk output in smallholdings and commercial farms. Our findings indicate that there is a scarcity of fodder fields or pasture for pasture-based cow rearing. Farmers choose to raise crossbred cattle over indigenous cattle because, according to our research and earlier studies, crossbred animals produce more milk than indigenous cattle. The amount of milk produced each day varies depending on the stage of lactation and parity. Small dairy farmers face numerous challenges, including a lack of feeds and fodder, a high cost of concentrate, and a lack of technical competence. Because small-scale farming accounts for the majority of Bangladesh's dairy production, it's critical to take steps to boost small-scale cow production, which will help the country's overall output.

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## Annex

### **General Information about farmer:**

Name:

Father's name:

Mother's name:

Age:

Previous experience:

How many years(if yes):

Educational background:

Mobile:

Address:

### **General information about farm:**

1. Name of the farm:

2. Address:

3. Farm size: Large scale/medium scale/small scale

4. Housing system: Intensive/Semi-intensive/Free ranging

5. Floor type: Concrete/soil/Cement

6. Ventilation status: Poor/Moderate/Good/Nothing

7. Drainage system: Poor/Moderate/Good/Nothing

8. Frequency of cleaning the house: Once a week/twice per week/Daily/Other

9. Visitor access: Restricted/Not restricted

10. Foot bath:Present/Absent

11. Record keeping: Present/Absent

if present-

12.Mark the following-

a) Tag no. b) Birth date c) Vaccination date d) Parity e) Deworming date

f) Heat period g) Pregnancy date h) Last hit date i) Other

### **Study Question:**

1) How many cows are there in your farm?

ans:

2) How many cows are pregnant?

ans:

3) Genetic status- Crossbred/Indigenous

4) How many cows are crossbred?

ans:

5) How many cows are indigenous?

ans:

6) How many animals are in their first parity?

ans:

7) How many animals are in their 2nd parity?

ans:

8) How many animals are in their 3rd parity?

ans:

9) How many animals are on lactating period?

ans:

10) How many animals are on dry period?

ans:

11) Vaccination status: Regular/non-regular/never

12) Deworming status: Regular/nonj-regular/never

13) Milk yield of a cow per day:

14) Feed management:

a) Roughage amount:

b) Concentrate amount:

c) Supplementary diet:

15) What is the cost of feed per cow per month?

ans:

16) Whatr are the common diseases you have seen in your farm in last 5-6 months?

ans:

17) What are the common medications you have been using in your farm?

ans:

18) What are the common antibiotics you have used in your farm?

ans:

19) Are you aware of AMR?-Yes/No

20) Do you contact with a experienced vet for consulting?-Yes/No

21) (If yes) How often you contact with vet?- Regular/non-regular/if any vet comes to the village.

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**The Author, November, 2021**

## **Biography**

This is Sattajeet Chakraborty, son of Sudhan Chakraborty and Bina Rani Chakraborty. I was born and raised in the Chattogram District. I graduated from Chattogram Collegiate High School in 2012 with a S.S.C and Chattogram College with a H.S.C in 2014. In the 2015-16 academic year, I was accepted into Chattogram Veterinary and Animal Sciences University's Doctor of Veterinary Medicine (DVM) program. As a future veterinarian, I hope to devote the remainder of my life to animal welfare. I want to work as both a field veterinarian and a professional practitioner.