CHAPTER I

INTRODUCTION

Dairy farming is one of the lucrative and profitable businesses under ideal livestock management practices. The economy of Bangladesh is based primarily on agriculture and livestock is an essential component of the rural economy and the livelihood of the subsistence of the farmers. The country has a sub-tropical monsoon and 84.4% of it population is living in rural areas.

Dairy farm is a technique to nurse cattle under a well-planned house to increase the production of milk and meat. Although, dairying is the most ancient occupation establised in the rural setting of Bangladesh, its development is unsatisfactory due to several problems. In 1998, there was existence of 30000 duck farms, 61000 poultry farms and 30000 dairy farms in Bangladesh. According to the agricultural census of 1996, the number of cattle, buffalo, goat and ram were almost same from 1983. Per capita it decreases 20 to 30 percent (Census of Agriculture, 1996). From 1991 to 2000 the annual growth rate of dairy product, meat and egg are 2.7%, 4.3% and 7.7%, respectively. Major portion of dairy product is come from the cross breeder cows. Average milk production per week of each dairy farm of Bangladesh is 48 liters. In private dairy farm of Bangladesh 73% of the dairy farms contain less than 11 cows, 17% of the dairy farms has 11 to 20 cows. It means that most dairy farms in this country are small in size called small scale dairy farm.

In 1991, the Bangladesh government launched a national program to increase milk production rapidly.This program provided subsidies to farmers who were rearing a minimum of five lactating dairy cows, either deshi, crossbred or exotic. Thi program was quite successful, milk production greatly increased, money was saved from not having to import so much powdered milk, and more raw milk was available in the markets for people's consumption. Bangladesh's indigenous breed of cattle, known as Red Chittagong, is quite suitable for small scale farmers due to its low feed requirements in comparison with productivity.

Most of the cattle of Bangladesh are non descriptive types, which do not belong to any specific breed and termed as indigenous breed. The dairy farm of Bangladesh generally consists of

indigenous cattle and crossbreds of Holstein Friesian, Jersey, Sahiwal and Red-shindhi. The indigenous cattle are smaller in size and their milk production capacity is lower than exotic breeds. The crossbred cattle produce 5-10 liters milk per/day (Nahar *et al*., 1992; Majid *et al*., 1998 and Hossain *et al*., 2002). The average milk production of zebu type cattle is 0.5-2.5 liters per day (Hossain *et al*., 2002). The purpose of dairy farming in Bangladesh is to make profit from milk production. The farm profitability depends on the number of cows reared, breeds of cow, type and level of supplementary feeding, availability of fodder, the amount of feed to be conserved to meet up the period of feed shortage and planned breeding program. The farm contains temperate crossbreds showed a higher profit than tropical crosses and indigenous cows. Recently, farmers have shown growing interest in rearing cattle exclusively for the milk production. Small-scale dairy farms have been developed mostly in urban and semi-urban areas where farmers prefer crosbred cows for producing milk (Shamuddin *et al*., 2006). Many NGOs, such as PROSHIKA, BRAC, Grameen bank and Aftab dairy are involved in the promotion of micro-credit for small livestock enterprises including dairy cattle. However, there is insufficient literature about the profitability of the small scale dairy farming in Bangladesh. Considering the fact the present study was conducted with aim to achieve the following objectives-

- ➢ To assess the profitability of small scale dairy farms in selected areas
- ➢ To know the rearing and management practices in small scale dairy farming system
- ➢ To determine the constraints in the small scale dairy farming

CHAPTER II

MATERIALS AND METHODS

This study was conducted at Upazila Veterinary Hospital, Sadar, Gaibandha during February, 2018 to March 2018. The herd size ranged from 5 to 10 milking cows. The owners of the dairy farms were interviewed and data were collected. The study population was consisted of crossbred cows like Holestein-Friesian, Sahiwal, Red-shindhi etc and also local cows.

2.1. Study area

All data were collected from Sadar upazila, Gaibandha (Figure 1). A total of 6 registered dairy farms were studied in that area.
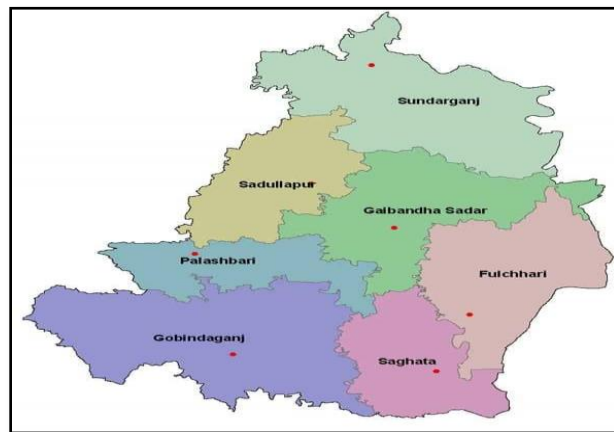

Figure 1: Map of the Gaibandha Sadar

2.2. Data collection

A structured questionnaire (APPENDIX-1) was designed to collect information related to the farm size, types of animal, types of management, length of lactation, milk yield per day per cow, types of fodder used, selling price of milk, feed cost, labor cost and other cost for the estimation of net profit of farms.

The interview schedule was developed in purposely with the objectives of the research. A survey schedule was prepared to record the desired information from the dairy cow owners. Before preparing the final schedule a preliminary survey schedule was designed for recording the

desired information in conformity with the objective of the study. After preparing a draft schedule it was however pretested in the areas. The survey schedule then changed, modified and rearranged according to the experience gathered in the preliminary field survey. Finally a set of interview schedules were prepared for recording the necessary information for the study. The data were collected through direct interviewing method of farm owners.

2.3. Equation of result estimation

The farm profit was calculated by deduction of all variable cost from gross returns. Deducting all costs from gross returns arrived at a net return from the farm (Hossain *et al*., 2005). The following equation was used for estimating net return from the farm,

$$\textbf{Net profit = TI – TC}$$

Where, TI = Total Income

TC = Total Cost

a. Total asset value: It includes mainly fixed cost-possession of land, land for housing, pasture land, farm building, equipments, current animal value, interest of bank loan, depreciation cost of building and farm equipment.

b. Variable cost: It includes feed cost per month, labor cost, medication, vaccination, artificial insemination, treatment cost, transportation cost, electricity cost, other maintenance cost.

c. Income from farm output: It includes-milk sale (total income per month), live animal sale (replacement stock sale, culled cow/bull) and animal by products sale.

CHAPTER III

RESULTS AND DISCUSSION

The results obtained from the study are presented below with table, suitable illustration and discussion.

3.1. General information

The general information of small scale dairy farm owners in Gaibandha showed that highest percentage of the farmers had business as the principal occupation and rest job seekers, agriculture. All of the farmers had higher secondary level education, nobody was found illiterate. Kabir (1995) conducted an economic study and found that the average literacy rate of farm households in all farm categories was also sufficiently higher than the national average. More than 76% house numbers of family in all farm categories had above primary level of education. It was found that four farm owners had training on dairy farm organised by DLS and the rest of the owners had no training on dairy farm management.

3.2. Number of dairy cattle

The dairy farms under study area consisted of different types of cattle. They mainly use Holstein-Friesian crossbreds and indigenous cows for milk production. The number and types of cow of these farms are presented in Table 1 and Table 2.

Table 1: Number of cattle reared in the studied farms

Name of the farms	Crossbred	Indigenous	Total
Farm-1	12	02	14
Farm-2	09	01	10
Farm-3	06	01	07
Farm-4	10	01	11
Farm-5	11	02	13
Farm-6	08	01	09

3.3 Housing system

The studied farmers used tin shed and straw shed with paved and concrete floor for housing. For boundary wall, they used bamboo and brick. The floor space per animal varied farm to farm. Farm-1, farm-2, farm-3 farmers provided floor space for a cow about 15 to 20 sq. ft., which was not satisfactory whereas farm-4, farm-5, farm-6 provided floor space were 20 to 30 sq. ft. In farm-6 animals were kept in unhygienic condition. Some farms had no drainage facility. Overall housing system was in average condition in most of the studied farm.

3.4. Feeding system

The cattle of the farms were fed according to the breed of cows and state of the cows. Both roughage (rice straw, green grass, water hyacinth etc.) and concentrate (rice polish, wheat bran, soybean meal, molasses etc.) are fed to the milch cows. On an average 3-4 kg rice straw/day/cow were provided to the indigenous cows and 4-6 kg rice straw/day/cow to the crossbreds. Farm-1, farm-2, farm-3 farmers were unable to provide *ad-libitum* green grass to their cattle. But other farms provide about 8-10 kg and 10-15 kg green grass to the indigenous and crossbred cows. The crossbreds were provided with more concentrate than indigenous cows because they produce higher amount of milk. They provide *ad-libitum* drinking water. All calves were fed milk by suckling.

3.5. Breeding system

It was observed that most of the cows were inseminated artificially. If the artificial insemination failed, they try naturally. Sometimes they were inseminated both naturally and artificially which is similar to the observation by Hossain *et al*. (2004), who found 93% cows were inseminated artificially. For artificial insemination, the majority of the farmers preferred Friesian semen. Different categories of the cows reared in the studied farm are presented in Table 2.

Table 2: Different categories of cattle in the studied farms

Types of animal	Farm-1	Farm-2	Farm-3	Farm-4	Farm-5	Farm-6
Lactating cows	08	07	04	06	06	05
Dry cows	03	01	02	02	03	02
Heifer calf	01	-	-	01	02	01
Bull calf	02	02	01	02	02	01
Total	14	10	07	11	13	09

The milk yield and different expenditure were higher in crossbreds than indigenous cows. The temperate breeds and their crossbreds produce more milk were reported by Khan *et al*., (2005). That's why farmers were interested in rearing more crossbred cows.

3.6. Yield performance

Average milk yield and lactation length of different breeds are presented in Table 3.

Table 3: Average milk yield/day and lactation length of the cows reared in selected farms

Farms	Milk yield(liter/cow)		Lactation length (days)	
	Crossbred	Indigenous	Crossbred	Indigenous breed
Farm-1	10	2.5	285	160
Farm-2	9.0	1.5	270	155
Farm-3	7.0	1.0	275	135
Farm-4	10	2.0	280	160
Farm-5	8.0	2.5	265	160
Farm-6	7.5	1.0	270	150

From the above table, it is cleared that the crossbred cows produce 7 to 10 liters milk, whereas the indigenous cows produce 1 to 2.5 liters milk per day. The crossbred cows produce more milk than indigenous cows in studying farm. This finding is similar with the finding of Alam *et al*., (1995), who reported that farm with crossbred more profitable than indigenous cattle.

3.7. Market value

Average price of milk, calf and the cost of labor in the studied farms are given in Table 4.

Table 4: Average price of milk, calf and the labor cost

Price of milk per liter	60 taka
Price of calf	8000-15000 taka
Labor cost per person per day	160-170 taka

3.8. Net income

Annual net profit of the farms was calculated by deducing total variable cost from total income, which is presented in Table 5.

Table 5: Annual net income of selected dairy farm

Criteria	Farm-1	Farm-2	Farm-3	Farm-4	Farm-5	Farm-6
Income						
Milk sale (tk)	1560000	1033000	826200	1100000	1207000	695000
Animal & by product (tk)	61600	25400	21000	35000	37500	20700
Total income (tk)	**1621600**	**1058400**	**847200**	**1135000**	**1244500**	**715700**
Cost						
Feed cost (tk)	1095000	608590	405585	626677	765200	107500
Labor cost (tk)	158700	106500	98500	108500	110500	100800
Treatment , AI cost (tk)	36500	24800	24050	23500	29000	34500
Electricity cost (tk)	14500	8500	7550	12870	13500	11000
Transport, others cost (tk)	18600	10900	11300	12000	11000	14600
Total variable cost (tk)	**1323300**	**759290**	**546985**	**783547**	**929200**	**268400**
Net profit (tk/year)	**298300**	**299110**	**300215**	**351453**	**315300**	**447300**

It is seen from the table 5 that there was variation in annual net profit between farms. This variation might be due to variation in milk yield, the management practices of the farms and breed differences. The fixed cost of the farms was more or less similar so that the fixed cost of

the farms was not included in this table. Small amount of purchased green grass was fed to cows and the amount of maximum green grass comes from roadside, crop field, river side.

Farm-4 and farm-5 which had similar housing, feeding management and operational cost differed in profitability due to crossbred variety. Temperate crossbred showed higher profitability than tropical crossbred. Similar findings were found by Khan *et al*., (2005), who showed that crossbred Sahiwal × Pabna and Holestein-Friesian × Local showed higher profitability than Sahiwal and Red-Sindhi cross. In farm-1, farm-2, farm-3 and farm-6 crossbreds were similar in type but their profitability varied which might be due to management practices and operational cost.

Despite having the same crossbred reared in farm-1, farm-2, farm-3 profitability varied among these farms due to the variation in management practices. Management of farm-4 was good and that's why the production and profit were higher. But in farm-1 the condition was poor which resulted in lower production and profit. Better management and care of livestock can improve productivity and food quality.

3.9. Constraints

> Available feed and fodder are the main constraints to small-scale dairy farmers. There are problems with both quality and quantity and a lack of economical technology for optimum utilization of local feed resources.

> Cattle breeds available are mostly indigenous. Efforts are being made to improve milk production through crossbreeding with exotic breeds.

> Presently, AI activities are carried out by the Bangladeshi Government's Department of Livestock Services (DLS) from 22 centres', 423 sub centre's and 554 AI point. The total number of AIs carried out each year is about 1.5 million (DLS 2000). In order to extend AI activities, a massive development project focusing on AI is being undertaken for the development of cattle for milk and meat production.

- Diseases present a major constraint to cattle production in Bangladesh; the extent of losses due to disease is very high. The country's climate, along with the poor nutritional status of cattle, contributes to a high incidence of cattle diseases, especially in the calves.

- It should be mentioned that the livestock sector has also not received adequate attention in respect of information and research.

The following recommendations may be suggested as broad guidelines for successful operation of small dairy farm in the study area-

1. Private sectors should be given priority to establish small-scale cattle feed industry providing financial support by the government and these feed industries will sell feed to the registered dairy farms in a fixed price recommended by government time to time.

2. The shortage of feeds and fodder may partially be overcome by introducing HYV fodder cultivation. The government and non- government organizations should play a vital role in disseminating the technology of HYV fodder cultivation in rural areas.

3. Good quality semen should be preserved centrally and distribute to the AI centres for further use as and when required basis.

4. Veterinary care and services to the small farm owners should be strengthened.

5. Regular short training programme on different management of dairying should be arranged for the farm owners and short term institutional loan or credit should be given to actual farm owners and to be checked regularly.

6. The price of milk should be fixed at a reasonable level and milk-marketing system should be improved through the invention by the government.

CHAPTER IV

CONCLUSION

The study can be concluded that the small-scale dairy farming might be profitable in spite of remaining constraints, if the breed selection, management system and operational cost can be maintained properly. Moreover, institutional support for expansion of milk supplies for rural areas, covering issues relating to the animal health, improvement of breeding, extension services and feed and drugs supplies is essential. Such institutional support should focus attention on the needs of small and marginal farmers and agricultural laborers since dairy development could relieve under-employment and low incomes.

CHAPTER V

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APPENDIX-1

Questionnaire

Date:

- Name of the owner:...
- Address of the owner:...
- Occupation of the owner:..
- Education:...
- Total no. of cattle:
- Milch cow: ....
- Heifer calf:...
- Bull calf:...
- Total milk production/cow/day:..
- Lactation length of cow:...
- Feed ingredients used:..
- Cost for management:
    - ✓ Housing cost:
    - ✓ Feeding cost:
    - ✓ Vaccine and medicine cost:
    - ✓ AI cost:
    - ✓ Electricity cost:
    - ✓ Labor cost:
    - ✓ Others:
- Source of income:
    - ✓ Milk selling
    - ✓ Calf selling
    - ✓ Culled cow selling
    - ✓ Manure selling
- Training:...
- Problems faced in farming:...

    ....

BRIEF BIOGRAPHY OF THE STUDENT

Tamanna Nayon Noor is an intern student for the degree of Doctor of Veterinary Medicine (DVM), Faculty of Veterinary Medicine, CVASU. She passed the Secondary School Certificate Examination (SSC) in 2009 from B.N. School and College, Chittagong and got CGPA 5.00 and then Higher Secondary Certificate Examination (HSC) in 2011 from Govt. Hazi Mohammad Mohsin College, Chittagong and got CGPA 5.00. Then she admitted to the degree of Doctor of Veterinary Medicine (DVM), Faculty of Veterinary Medicine, CVASU in 2012-2013 session. Now she completed her internship successfully.