VALUE CHAIN ANALYSIS OF DAIRY MILK PRODUCTION AND MARKETING: A FARM LEVEL STUDY IN DHAKA DISTRICT

SHANJIDA AKTER

DEPARTMENT OF AGRIBUSINESS & MARKETING

SHER-E-BANGLA AGRICULTURAL UNIVERSITY

DHAKA-1207

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ABSTRACT

The present study was undertaken to determine the socio economic characteristics of dairy farmers and value chain actors, to identify existing and efficient value chain, to measure production, relative profitability and value addition, to estimate productivity and resource use efficiency of dairy milk production and marketing. For achieving these objectives, 50 respondents were selected randomly and purposively from Mohammad purthana and Dhamrai thana of Dhaka district. The sample included 30 milk producers and 20 value chain actors. Both primary data and secondary data were used in the study. Both tabular and econometric techniques were used to find out the results. Costs, returns, profitability, value addition were calculated separately through tabular analysis. The result of the analysis showed that the total cost per day per cow was estimated at Tk. 378.89 and net return was calculated Tk. 30.86 for a dairy farm. The value addition for per liter of milk produced in dairy farmers, Faria, Bepari, sweetmeat shopper was calculated at Tk.28.06, Tk. 1.63, Tk.2.53, and Tk.40.01. The benefit cost ratio of dairy farming was 1.80. Findings of the study clearly indicated that dairy farming was a profitable enterprise. Cobb-Douglas production function was used to estimate the contribution of key variables of the production of dairy milk. The functional analysis indicated that most of the selected variables had significant impact on the production of dairy milk. This study also identified problems faced by dairy farmers such as lack of credit, high labor cost, disease problem and inadequate veterinary care, lack of sufficient electricity facility, expensive and inadequate feed supply, lack of grazing land and green grass, lack of adequate extension services and technical knowledge, shortage of capital, low quality feed, preservation problem, lack of milk processing center, and high packaging cost. Ensuring easy access of institutional credit,improve owner-labor relationship and veterinary service, supply of high quality feed at subsidized price, allocation of khas lands for producing fodder/grass, steady supply of electricity, ensuring technical knowledge and extension service, and establishment of milk processing center were suggested to solve the problems. The study also identified some major problems of other value chain actors and probable solution to those problems. Finally, some recommendations were made for policy implication.

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ABBREVIATIONS

ASA	Association for Social Advancement
BBS	Bangladesh Bureau of Statistics
BOS	Bangladesh OrthonoitikSamikkha
BCR	Benefit-Cost Ratio
BKB	Bangladesh Krishi Bank
BRAC	Bangladesh Rural Advancement Committee
DLS	Directorate of Livestock Services
etal.	et alia (and others)
etc.	et cetera (and others and so forth)
FP	Net Price Received by Farmers
GOB	Government of Bangladesh
GDP	Gross Domestic Product
HSC	Higher Secondary Certificate
Kg	Kilogram
Ln	Natural Logarithm
L	Liter
MFC	Marginal Factor Cost
MoF	Ministry of Finance
M.S.	Masters of Science
MVP	Marginal Variable Cost
ME	Market Efficiency
NGO	Non-Government Organization
OLS	Ordinary Least Squares
%	Percentage
SSC	Secondary School Certificate
Tk.	Taka
TFC	Total Fixed Cost
TVC	Total Variable Cost

CHAPTER 1
INTRODUCTION

1.1 Background

Bangladesh is an agricultural country of which livestock sector is the prominent sector. Agriculture is the single largest producing sector of the economy and it contributes about 12.27% to GDP and employs around 47.3% of the total labor force (GOB, 2105). Agricultural sector is dominated by crop production, forestry and livestock. The greater agricultural sector also include fisheries subsector that contributes 3.69% to GDP. Agriculture has a great impact on employment generation, poverty alleviation and food security. Dairy farming is an integral part of agricultural production system in Bangladesh. Dairy farming is an economic activity involving investment for milk production and marketing. Daring is a biological system that converts large quantities of feed and roughages into milk. It is an efficient and intensive system, in terms of nutrients and protein production for human consumption from a given quantity of resources. It is also more labor intensive and it provides substantial employment in production, processing and marketing. Because of agro-climatic features of Bangladesh dairy could prove to be an instrument of increasing income and employment in the rural area. A significant number of small and landless farm families have diverted to dairying to supplement to their family income in Bangladesh. Some big commercial capital intensive dairy farms have also come up in recent year.

Dairy sector of Bangladesh is playing an important role in our agricultural and national economy. The livestock and dairy sector contributed 1.78% to the GDP (GOB, 2015). The livestock sector generates 20% of full-time employment in Bangladesh (DLS, 2014). This country is producing milk well under the requirement and most of the demand is being met from import of dry milk from the international market. It is long overdue to revitalize this sector with appropriate technology to meet both local milk and meat demand.

Value chain analysis is essential to an understanding of markets, their relationships, the participation of different actors, and the critical constraints that limit the growth of livestock production and consequently the competitiveness of smallholder farmers. These farmers currently receive only a small fraction of the ultimate value of their output, even if, in theory, risk and rewards should be shared down the chain.

Total number of livestock was 234.39 lakh in the year 2013-14 which was ranged between 229 to 233.41 lakh during the period from 2008-09 to 2012-13(Table-1.1). The per year growth rate of livestock number was 0.38% in the period 2008-2014 which was not a satisfactory rate. Due to slow increase of livestock number, there is a year round great shortage of milk and meat production in Bangladesh. The yearly milk and meat production in Bangladesh is 6.09 and 4.52 million metric tons but the national demand is about 14.04 and 6.73 million metric tons, respectively (DLS, 2014). The growth rate of milk production over the period 2008-2014 was 10% and meat production growth rate was 19% (Table-1.2). But still, the current per capita availability of milk and milk products (32.6 ml per person per day) is much lower than the FAO recommended body requirements of 250 gm. The shortfall in supply was largely filled by imported milk and milk products.

Table-1.1 Number of cow and total domestic animal in Bangladesh

Animal (Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Cow	229.0	229.76	230.51	231.21	231.95	233.41	234.39
Total Livestock	485.0	495.58	506.52	516.66	528.36	532.11	536.60

Source: MoF (2014).

Table-1.2 Milk and meat production in Bangladesh lakh metric tons

Fiscal Years	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Milk (Lakh MT)	22.80	26.50	22.86	23.65	29.47	34.63	50.67	37.38
Meat (Lakh MT)	10.4	10.4	10.84	12.64	12.79	23.32	36.2	30.21

Source: MoF(2014); DLS(2014)

With the development of modern civilization and culture, particularly the emergence of high income, urban population has changed the pattern of dairy product consumption. They are becoming more enthusiastic toward processed milk and milk products over ordinary raw milk. Therefore the use of ghee, butter, yogurt and other milk product have been considerably increased.

The term value is synonym to ''value added'' in the Value Chain Analysis (VCA) as it characterizes the incremental value of resultant product produced from processing of a product. For agricultural products, value addition can also take place through differentiation of a product based on food safety and food functionality. Commercial farms possess mainly Sahiwal, Red-Sindhi, Holstein, Jersey, Holstein-Friesian crosses, Jersey crosses and Sahiwal crosses etc. Cross-breeding are practiced around the larger cities like Dhaka. Special emphasis has been given to the processing and marketing of fresh milk which is an emerging area in urban agribusiness.

1.2 Statement of dairying and value chain

Dairy farming stands a profitable business everywhere in the world. So dairying in the recent decades has been considered a vital component in the diversification of agriculture in Bangladesh, particularly for rural system.

It provides nutrition, organic manure, supplementary employment, and cash income and draft animal power in Bangladesh. As it is labor intensive farming and support employment in production, processing and marketing, so, development of dairy enterprise is essential to create employment opportunities of the people.

Dairy farming is a class of agricultural or animal husbandry enterprise for long-term production of milk, which may be either processed on-site or transported to a dairy factory for processing and eventual retail sale(www.wikipedia.org/wiki.dairing). Majority of dairy farms in the country are private which can be categorized into five different groups: 1. Dairying for home consumption; 2. Rearing of cows for dual purposes (draft and milk); 3. Small-scale dairy farming 4. Medium sized commercial dairy farming 5. Private large commercial dairy farms (Halder and Barua, 2003).

The value chain was described and popularized by Michael Porter in his 1985 Best-Seller, Competitive Advantage: Creating and Sustaining Superior Performance. The value chain can be a very useful conceptual tool when trying to understand the factors that impact the long-term profitability of business and when developing a successful strategic plan for business.

The value chain can be thought of as a set of activities, services, and products that lead to a product or service that reaches the final consumer. The value chain can help answering questions regarding:

   i)   how the products a farmer produces reach the final consumer;
   ii)   the structure (economic relationships) among actors in the chain;
   iii)   how this structure is likely to change over time;
   iv)   the key threats to the entire value chain;
   v)   the key determinants of share of the profits created by the chain

1.3 Nutritional value of milk

Milk provides protein of high biological value and it is a good complement to the limiting amino acids in plant foods consumed (Table1.3). The fact that every country in the world has a dairy development strategy/policy and engages in milk production demonstrating the importance of milk in balanced nutrition.

Table 1.3 Nutritional value of milk (in every 244gm or 1 cup)

Item	Quantity
Calories	150 gm.
Protein	8 gm.
Fat	8 gm.
Saturated fat	5.1 gm.
Carbohydrates	11 gm.
Calcium	291mg.
Iron	0.1 mg.
Sodium	120 mg.
Vitamin A	310 µg.
Ascorbic Acid	2 mg.

Source: World Almanac (1999).

1.4 Importance of dairy farming in Bangladesh

It is well known that milk is an ideal food for humans, particularly to sustain growth in children, fetal growth in pregnant women, and milk production during lactation. It has also been described as nature's most perfect food. For the newly born infant or animal, mother's milk is a complete and well-balanced food. Its main constituents, which supply energy and building materials for the young, are accompanied by various nutrients, such as minerals, vitamins, and organic compounds. Cow dung is essential nutrient for soil fertility maintenance. It is also used in bio-gas production. Part of dried cow dung is being used as fuel for cooking purpose in rural area.

Livestock plays an important role in human civilization. Economic uses of livestock sector are developed with the change of the nature of soil, air and sunlight associate

with civilization. Our culture highly appreciated large number of cattle of a farmer and culturally we are very much fond of milk. Demand for this sector increases with increase of population. Density of population is very high in this country and growth rate is still high. This sector can play an important role to fulfill the nutrition demand of this huge population. This sector can solve the unemployment problem of the rural people and can ensure the sustainable multipurpose use of our land. So this sector has the ability to ensure the certain mobility of the economy of Bangladesh through poverty reduction, nutrition supply and employment creation.

Bangladesh is internationally well placed to produce milk due to availability of cheap labor. Yet Bangladeshi mini-dairy farm did not appear to be much profitable in spite of relatively higher domestic milk price. Bangladeshi farmers can gain higher profit through improved breeds, feeding, health care and management (Alam, 1995). Now a day, farmers are gradually improving in those issues and management practices. In some districts especially Dhaka district small and large scale dairy farms have been increasing day by day.

Due to globalization and the impact of world milk price changes, dairy farmers need to find ways of reducing costs and increasing returns in order to be more competitive. In order to establish future plan to uplift the dairy farmers from their less profitable farming to higher profitable business it is essential to know details about the management practices, value addition activities, relative productivity, profitability, and resource use efficiency of small-scale dairy contract and non-contract farming. Increased production of milk will serve as saving of foreign exchange on the one hand and contribute to national product and hence increase farmer's income on the other.

1.5 Contribution of livestock sector

Bangladesh is an agro based country and about 47.30 % of total labor forces are engaged in this sector (BBS, 2010) . The contribution of livestock to GDP is1.73 percent of total, which is 14.09 % of agricultural GDP.It constitutes an important part of our national economy. The crop sector in agriculture has largely been dependent on livestock . In addition to draft power and leather, livestock provides manures, meat and milk to the vast majority of people. The dairy cow play a significant role in

maintaining a strong agricultural economy of Bangladesh.Table 1.4 shows the contribution of agriculture and its sub-sectors to GDP of Bangladesh.

Table 1.4 The contribution of agriculture and its sub-sectors in GDP (Base years 2005-06)

Sector/ Sub-sector	i) Crop	ii) Livestock	iii) Forestry	Agriculture
2006-07	11.08	2.27	1.83	15.17
2007-08	10.88	2.19	1.82	14.89
2008-09	10.63	2.13	1.82	14.58
2009-10	10.79	2.06	1.81	14.65
2010-11	10.5	1.98	1.79	14.27
2011-12	10.01	1.9	1.78	13.7
2012-13	9.49	1.84	1.76	13.09
2013-14	9.28	1.78	1.74	12.81
2014-15	8.83	1.73	1.72	12.27
Share (%)	71.96	14.09	14.01	100

Source: GOB, 2015

1.6 Prospects of dairy sector in Bangladesh

Dairy farming is a potential pathway out of poverty for millions of Bangladeshis. Among the animal products, milk contains a high nutritional value. It contains all ingredients required by the human body in proper proportions and in a very easily digestible form. Also the inclusion of milk in the diet increases the digestibility of other types of food which are included in the diet. The demand for milk and milk products is increasing because of the rapid increase in population, the spread of education and growing nutrition awareness. In fact, in most of the cities milk supply at present is short of requirements. For these reasons, dairy development has assumed a position of paramount importance in the rural economy of Bangladesh. It is essential that this sector, like every other sector of tropical agriculture, should be modernized and made more productive as quickly as possible.

Dairying is a good source of income to the small and marginal farmers. The feeds required for milk production can be met from their limited land resources as most of the milch animals are ruminants and the majority of their food can be derived from

forages, coarse roughages and byproducts not utilized by human beings, without incurring much additional cost.

Bangladesh is approaching a population inflection point as the numbers are projected to rise sharply by over 300 million between 2000 and 2030 which is more than twice the population increment (World Bank, 2005). Currently there is a huge deficit in the availability of milk. The deficit accounts for 7.93 million tons (Table 1.5). Urgent attention is required to provide milk for the growing demand. Much of the demand for dairy products will be concentrated in the urban and semi-urban area.

Table 1.5 Production, requirement, and deficits of milk

Items	Per capita requirement	Annual requirement	Annual availability	Annual Deficit
Milk	250 ml/day	14.02 million ton	6.09 million ton	7.93 million ton

Source:DLS (2014).

Cattle population in Bangladesh suffers from acute shortage of feed (Alam, 2005: 2008). Because of lack of pasture land, resulting from conversion of fallow grazing lands into crop land ruminant animals have to depend for their feed mostly on dry rice straw and weeds and grasses from wastelands, roadsides, embankments, forests, etc. As a result, most of the animals are suffering from malnutrition and being more vulnerable to diseases and less prolific. Cows in the country consist mainly of indigenous breed of animals which are genetically low producers, producing very little quantity of milk compared to other countries of Asia (Table 1.6). Consequently, the country has to depend on milk imports to satisfy its domestic demand.

Table 1.6 Milk yield per cow per year of selected countries of Asia

Country	Yield in kg
Asia average	1220
India	1014
Bangladesh	206
Pakistan	1179

Source: FAO (2008).

The domestic demand for milk has been rising faster than the domestic production of milk, and as a result, the volume of imported milk has increased significantly over the years. The expenditure on import of milk and milk products increased from US$83 million in 2006-07 to US$289 million in 2013-14 (Table 1.7), the average being US$199 million per year from 2009-10 to 2013-14.

An increase in domestic production of milk will increase the supply of fresh milk in the country and help to reduce the volume of imported milk. To meet the storage of milk, the country has been importing huge quantity of milk and milk products from different countries every year (Table 1.7)

Table 1.7 Milk and milk product import in different years
(Million US$)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Milk and milk product	83	137	96	106	161	221	214	289

Source: Bangladesh Bank, 2014

Nevertheless, livestock helps to earn foreign exchange through exporting hide, bone etc. and improves balance of trade payment (BBS, 2014). Poor milk marketing and

supply chain at potential milk producing areas is also deterring many entrepreneurs to be involved with commercial dairying. In addition, flooding of local markets by imported powder milk leads to market volatility for locally produced liquid milk. The

dairy sector, having huge prospects, can bring about a revolutionary change in the socioeconomic condition and standard of living by generating incomeby reducing milk import.
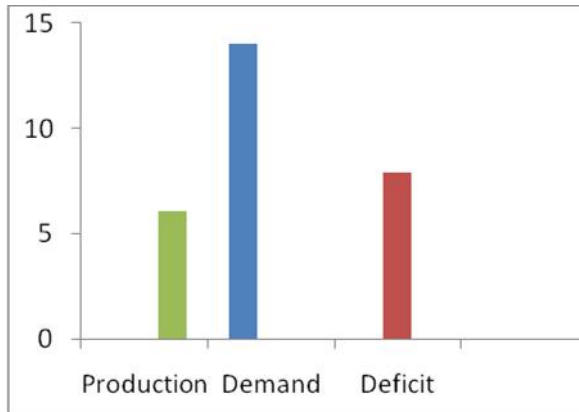
Figure 1.1 Production, requirement and deficits of Milk
The horizontal axis indicates the amount in million ton.
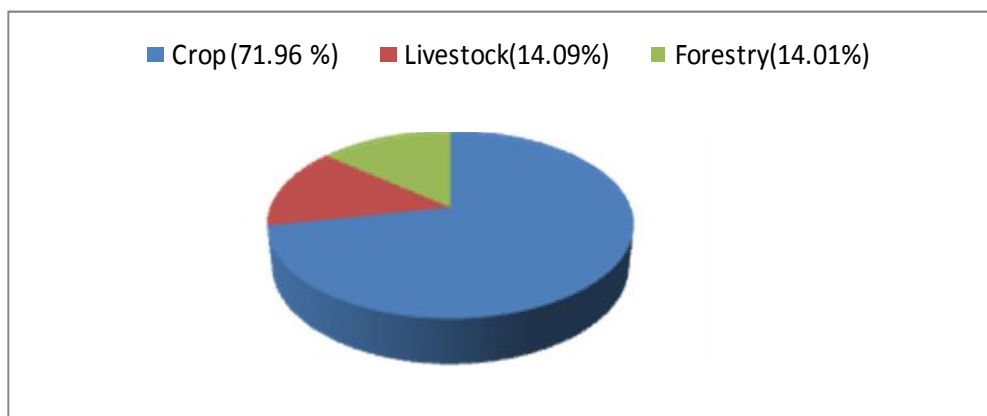
Figure 1.2 Contribution of sub-sector of agriculture to total contribution of Agriculture in GDP in 2013-14

1.7 Justification of the study

With the rapid growth of population, the demand for milk and dairy products rises faster than the demand for crops both in developing and developed countries. As a means of sustaining and accelerating dairy and thereby promoting agricultural growth in Bangladesh there is a great need to study the reasons for poor development of dairy sector and find ways to overcome these constraints in dairy rearing, marketing and profitability.

Creating new channels in milk market, these dairy farms expanding their business depending on the established and potential urban consumers. They are providing fresh dairy product, in particular, fresh packaged milk for the urban consumers, through their own sale centers and most of the cases through retailers within the town area. It has become very necessary to conduct study covering modern marketing system, which is still surviving with the modern channels. Therefore, the present study has been undertaken to identify the existing marketing channels, the overall marketing system and the pattern of distributing milk in urban and sub-urban area of Dhaka district.

This study will help to identify problems in different value chain stages from production to marketing, and also give suggestions for probable solutions which in turn will improve the dairy value chain in Bangladesh. So, it is expected that the present study would be helpful to individual dairy farmers, milk trader, processors, retailers, policy makers, extension workers and researchers with a view to taking further analysisand plan for dairy development.

The dairy sector has still been a neglected field. Without any attempt to develop it the achievement of the goal of self-sufficiency in food, which is the first and foremost of the basic necessities of life will be difficult (Kar, 2003). Only a scientific study can help to find out objectively the impact of markets on the production, processing and consumption of milk.

There is a huge scope of production and marketing of milk in the study area. The study was new for that area; it will enhance the existing milk production. More importantly, it was urgently needed to identify inefficiencies of milk producers and market intermediaries for improving their present situation. The spatiality of this study was to provide some important information regarding supply chain and value chain performance of milk in the study area.

1.8 Objectives of the study

1. To determine the socio-demographic characteristics of dairy farmers and other value chain actors;

2. To identify existing and efficient milk value chain in marketing channels;

3. To measure production, relative profitability and value addition in every stage of channels;

4. To estimate productivity, resource use efficiency in milk production by farmers, and

5. To identify problems and recommend policy reform options to improve dairy marketing system.

1.9 Limitations of the study

Some limitations were faced during conducting the study. These are:

1. The required data for the study were collected through a simple face to face interview following a sample survey method in which 40per cent dairy farm owners did not let the researcher examine their record books. In such cases the researcher had to depend on their verbal information regarding several questions. Among the dairy farmers a tendency of making overstatement about various cost items incurred by the respondents was observed.

2. There was also a shortage of time and resource, for these reasons it was not possible to consider a large number of sample for the present study.

3. One more limitation of the present study was that, only urban markets of milk of some selected area of Dhaka district was considered.

4. Another reportable limitation is, only those dairy farms were selected as sample which are selling unpasteurized packaged milk or raw milk through intermediaries or their own labor.

5. Milk producers and traders had records in many cases but they were reluctant to show the records(monthly income, volume of business, store rent) due to fear of implication of income tax.

1.10 Organization of the thesis

Chapter one describes the background, statement of dairying and value chain, nutritional value of milk, importance of dairy farming in Bangladesh, contribution of livestock sector, prospects of dairy sector, justification of the study, objectives and limitations of the study. The second chapter provides review of literature. The third chapter consists of the research methodology. Chapter four provides the socio-demographic profile of dairy farmers and market intermediaries. Chapter five briefly discusses about profitability, value chain and value addition analysis of milk in the study area. Chapter six consists of productivity and resource use efficiency of dairy farming in the study area. Chapter seven contains constraints to dairy value chain actors and suggested measures; and Chapter eight discusses summery, conclusion and recommendations.

CHAPTER 2
REVIEW OF LITERATURE

Literature on the marketing efficiency and value chain development of dairy milk is considerably inadequate particularly in Bangladesh, because very little research has been done on these issues. This chapter deals with a brief review of the results of the previous studies related to the present research work. However, some relevant studies in respect of production and marketing efficiency, supply chain and value chain of dairy milk are available from Bangladesh as well as from other countries. This chapter is concerned with the review of literature related to production and marketing, supply chain and value chain of dairy milk.

Jabbar (2009) carried out a study on Policy Barriers for Dairy Value Chain Development in Bangladesh with a focus on the North West Region. It revealed that in the traditional or even processor driven supply chains, actors including producers exchange goods and services, so there is a flow of goods and services. In most cases transactions for inputs may involve a different set of actors and chains than transactions for products. And while different actors perform different functions and there are informal rules and norms governing these transactions and relationships, there is no integrated system of governance that legally binds all actors giving each specific rights and obligations. It also focused on a supply chain each actor tries to maximize its returns at the expense of the other(s) while in a value chain framework; there are agreed principles for sharing of benefits from improvement in chain functions and performance.

Pathan (2011) conducted a research on an economic analysis of smallholder dairy farming. To identify the most important variables in the production process Cob-Douglas production function model was used. The study revealed that dairy cow rearing was profitable. Total cost of rearing a dairy cow per day was estimated at taka 71. The total return per day was estimated at 139 for a dairy cow.

The value of milk production represented 82.04% of total return. The respective net return was Tk. 68 per day for a dairy cow. The average milk yield per day was 2 liter. The study identified some crucial problems such as scarcity of feed and fodder, lack of improved breed, lack of veterinary care and service, lack of institutional credit and high price of concentrate feed.

Saadullah (2000) conducted an economic analysis on dairy cow rearing and found that dairy farming is a profitable enterprise. The study showed that feed cost is the largest single cost item of raising dairy cow. In local breed and cross bred, feed constitute 60.01 and 67.57 percent of total cost, respectively. In local breed and cross bred net returns per day per cow were Tk. 16.43 and 82.01, respectively. Benefit cost ratio of local breed and cross bred were 1.38 and 1.90, respectively. Cobb-Douglas production function was used to estimate contribution of the variables in getting higher return by the farmers. Although the supply of domestically produced animal products (milk, meat and eggs) has increased by about 1.2% annually (DLS 2000), the per capita daily availability of milk and meat is only 32.6 ml and 10.2 g against the requirement of 250 ml and 120 g, respectively. Consequently, consumers face an acute shortage of livestock products like milk, meat and eggs for which supply fails to meet the requirements of 85, 89 and 75% of the population, respectively. The major constraints to dairy cattle production are the shortages of quality feeds and fodder and breeds.

Quddus (2006) performed a study to know the profitability of dairy farming, milk consumption pattern and marketing system of dairy farmers. It was found that net return of dairy milk in commercial region was significantly higher than that of other regions due to rearing of cross bred cows and feeding them with high quality feed. Net return from dairy enterprise was 69 percent of the gross cost and this figure was the highest in the semi-urban region (75%). The positive values of marginal value product indicated that addition of dry fodder, capital investment and labor would add positive returns through milk production. Average per capita daily milk consumption by the dairy owners of different income classes and different regions were significantly different.

Mandal *et al.* (2013) conducted a value addition analysis of participants of wholesale milk market. The result showed that the total cost per day per dairy cow was estimated Tk. 94.16 and net return was Tk. 78.59. The marketing cost incurred per 100 litre of milk was Tk 132.63, 147.50 and Tk 4726.60 for beparies, wholesalers and sweetmeat shops, respectively. The value addition of per 100kg of milk of beparies, wholesalers and sweetmeat shops were calculated at Tk. 367.37, Tk.152.50 and Tk. 1023.40, respectively.

Hassan *et al.* (2012) observed that various middlemen perform different functions in the process of marketing and they charge fees for the services they provide. These charges include costs of packaging, loading, unloading, sorting, grading, market fees, commission, etc. In the case of the profit of the middlemen, beginning from the sale of the produce from the growers till it reaches the consumers, different actors like 'Faria', 'Bepari', commission agent, wholesalers, retailers, and so on handle produce and they earn profit by adopting this profession. Their profit is included in the price of the commodity and it also becomes a part of the market margin.

Alam *et al*. (1995) evaluated the economics of mini dairy farming in some selected areas of Bangladesh. The result showed that the production of milk per crossbred cows was higher (5.66 litres) than that of local breeds (2.23 litres). It also indicated that the mini dairy farm is more economically profitable than the large one. The small farms employed more female family labors while large farms depend more on hired labors. The expansion of dairy farming with crossbred cows was suggested for accelerating income and employment opportunities in rural Bangladesh.

Habibullah (1997) conducted a research on prospects and problems of developing dairy farms in private sectors. He found that among the costs of dairy animals, feed cost is the largest item of the total cost items. The share of concentrate feed was almost double the share of roughage of all categories of farms. The higher proportion of concentrate feeds was positively related with higher number of dairy animals and also with higher milk production in the farms. Return from milk was the largest return component in total returns of dairy farming in private sector. This study showed that

high price of veterinary medicine and high price of concentrate feed are the biggest problem in raising dairy animals.

Khan *et al.* (2003) made a review of milk production in Bangladesh with particular emphasis on small-scale producers. The purpose of the study was to assess the economics of dairy farming in Bangladesh and to gauge the prospects for improving the dairy income for small-scale producers which currently form the backbone of the dairy industry. The study only addressed milk production from bovines although a part of the milk in Bangladesh is produced by goats. Preliminary estimates of the margins of the dairy are provided. It is concluded that milk production from bovines in Bangladesh is not competitive internationally and that under a liberal trade regime for dairy products dairy farmers in Bangladesh are unlikely to fully benefit from the vast increase in milk demand predicted to occur over the next ten years unless productivity is significantly improved.

Rahman (2009) conducted on an economic analysis of dairy cow rearing under Rangpur dairy. The study found that the rearing cost per day of local and crossbred cow were 43.59, 90.97 respectively. The average milk yield per day per cow was 1.46 liters and 4.59 liters for local bred and crossbred respectively while the total return per day was estimated at 60.02 and 172.98 for the same.

 The value of milk reproduction represented 70.52 and 77.02 percent of total returns for local breed and crossbred farms, respectively while the net return per day per cow was 16.43 and 82.01. BCR per day per cow was Tk. 1.38 and Tk. 1.90 for local bred and crossbred cow rearing respectively. The study also revealed that green grass , concentrated feed, labor cost have significant positive impact on milk yield for local breed cows and all the inputs other than labor cost have positive impact on milk yield for crossbred cows. The study also indicated that the profitability of crossbred cow was higher than that of the local breed cows. Cob-Douglas production function model was used here to determine the effect of key variables.

Mendoza (1995) found that the size of market margins is largely dependent upon a combination of the quality and quantity of marketing services provided the cost of providing such services, and the efficiency with which they are undertaken and priced. For instance, a big margin may result in little or no profit or even a loss for the seller involved depending upon the marketing costs as well as on the selling and buying prices.

Shantana *et al.* (2003) conducted a study on dairy production, consumption and marketing in Bangladesh which revealed that milk production in the country has been increasing but not sufficiently to meet the large demand. The study showed that like production, per capita consumption has also increased but its level across the country is still very low. Worryingly, milk is another product where consumption appears to be declining for the poor as middle/upper income urban markets capture the available milk supply. The increase in collection networks by both NGO and private sectors have encouraged increased production but this has not increased consumption at the local level. In this case remoteness from markets can be an advantage nutritionally for poor producers, as they are likely to produce for home and neighborhood consumption.

Yet producers with good market access fail to fully benefit from the high urban demand, as the intermediaries capture the high margins. The most vulnerable to declining milk consumption are market dependent poor groups, the landless rural poor and slum dwellers.

Acording to Chhina (2009) and Hassan *et al.* (2012) marketing margin is very important for several reasons, such as to study marketing efficiency, compare different markets, improve marketing system, study the role of the middlemen, and implement different Government policies. Role of middlemen is an important aspect in influencing the marketing costs and margins. If the results of marketing margins of the different middlemen indicate that there are certain unreasonable charges, and inefficiency in the services of the middlemen, those can be improved accordingly. Another important aspect of marketing margin analyses is

the implementation of Government policy. The Government formulates policies with the objective of improving the efficiency of marketing.

According to UNIDO (2011) a positive or desirable change in a value chain is required to extend or improve productive operations and generate social benefits, poverty reduction, income and employment generation, economic growth, environmental performance, gender equity and other development goals. Value chain development interventions can focus on improving business operations at the level of producers, processors and other actors in the chain and/or the (contractual) relationships among them, flow of knowledge and information and innovation. Value chain development can also foster overall coordination in the chain; participation of selected beneficiaries in local, national or global value chains; reduction of entry barriers and a higher share of value addition for certain actor.

According to AGRICO (2004) value chain analysis revealed the dynamic flow of economic, organizational and coercive activities involving actors within different sectors. It showed that power relations are crucial to understanding how entry barriers are created, and how gain and risks are distributed. It analyzed competitiveness in a global perspective. By revealing strengths and weaknesses, value chain analysis helps participating actors to develop a shared vision of how the chain should perform and to identify collaborative relationships, which will allow them to keep improving chain. The latter outcome is especially relevant in the case of new manufacturers including poor producers and poor countries that are seeking to enter global markets in ways that can ensure sustainable income growth.

Uddin *et al*. (2010) studied on farm economic analysis of different dairy production systems in Bangladesh. The TIPI-CAL model was used for economic simulation. The authors observed that dairying in Bangladesh is growing fast but faces problems of

high input and low output prices leading to lower profitability. The results showed that each system differed in terms of inputs, outputs, costs, returns and entrepreneur's profit. The large-scale intensive production system had the lowest milk production costs (30.88 US-$/100 kg Energy Corrected Milk (ECM) compared to 43.46 US-$/100 kg ECM for the small-scale traditional system. The highest milk yield was observed in the large-scale intensive dairy farming system (1600 kg ECM/year). Milk yield increased and the cost of milk production decreased with increasing farm size. The high opportunity cost for own factors of production (land, family labour and capital), the differences in economics of scale and institutional support (infrastructure, provision of support services such as artificial insemination and veterinary services) are the key drivers for differences in costs of production in different systems and low profitability.

Khan *et al*. (2000)   studied on reproductive and economic performance of dairy cattle in Bangladesh. The dairy cattle improvement program in Bangladesh aims to improve local cattle for milk production by incorporation of both tropical breeds (Red-Sindhi, Sahiwal) and temperate breeds (Holstein- Friesian and Jersey). The CCBS controls overall breeding programs throughout the country, except for the Cooperative Dairy Production System. The productive and reproductive performances of different crossbreds have been studied by several researchers and they showed that the Holstein-Friesian crossbred performed better than others. An economic evaluation of dairy cattle in Bangladesh showed that the purebred and crossbred of temperate breeds had higher profit than other crosses but their survivability is lower than tropical breeds

Shamsuddoha *et al*. (2000) studied on problems and prospects of dairy industry in Bangladesh. They observed that although dairying is the most ancient occupation established in the rural setting of Bangladesh, its development is unsatisfactory due to several problems. The main problems include breeding, feeding, management,

diseases and marketing. The dairy sector has also not received adequate policy support in respect of information generation and research. The demand for milk is growing at a faster rate than supply because of the rapid increase in population, creating a widening imbalance between demand and supply. There is a need to have knowledge of the existing demand, its growth over time, and the existing supply possibilities. There are also many types of information needed for proper functioning of markets. In the light of such knowledge it would be necessary to take policy measures for providing strong institutional support to increase domestic production and reduce the imbalance between supply and demand. To address the industry's problems effectively, sources of market failures and of government policies have to be carefully studied.

Gisby (2010) conducted a study on the cornerstone of the Chars Livelihoods Program's (CLP's) approach to poverty alleviation. The program made the provision of investment capital with which participants purchase income-generating assets. Most participants choose cattle. The CLP has been promoting crossbred, rather than local cattle, as they are widely viewed as being more profitable. This study explores whether this is indeed the case, in order to assess whether the CLP should continue to promote crossbred cattle as the program moves into its second phase. In theory, crossbred cattle are more profitable for two reasons: they grow faster and dairy cattle produce more milk. However, crossbred cattle are also seen as more difficult to manage. Owners have to adhere to specific deworming and feeding requirements in order to prevent disease and maximize profit. It was observed that the larger size of crossbred animals (which means they require more feed) makes them more costly to rear than local cattle, in terms of both time and money.

 Chhina (2009) observed that low marketing cost expressed as a percentage of the consumers' price is not an indicator of high efficient market and similarly the

marketing cost expressed as a percentage of the consumers' price is always not an indicator of low efficiency market system.

Nagurney (2006) explained a supply chain as a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials, and components into a finished product that is delivered to the end customer. In sophisticated supply chain systems, used products may re-enter the supply chain at any point where residual value is recyclable. Supply chains link value chains.

Mondal _et al._ (2010) investigated on a comparative economic analysis of local breed and cross breed milk cow in a selected area of Bangladesh. The result showed that per day total costs of rearing per local and cross breed cow were Tk.32.85 and Tk.71.23, respectively. Feed cost constituted about 58 percent of total cost for local breed cows while it was 62 percent for cross breed cows. Paddy cost occupied the largest share out of total feed cost in local breed cows. The average milk yield per day per cow was 1.89 liters and 7.68 liters for local breed and cross bred dairy cows, respectively while the total return per day per cow was estimated at Tk.58.27 and Tk.224.76 for the same and the net returns per day per cow were Tk.25.42 and Tk.153.53. The study revealed that green grass, concentrate feed, labor cost and capital cost have significantly positive impact on milk yield for cross breed cows but all the inputs other than labor cost and capital cost have positive impact on milk yield for local breed cows. It was further observed that the resources were not

efficiently used by both local breed and cross bred farms. However, it was found from the study that profitability of cross bred cows was higher than that of the local breed cows. The study identified some major problems and constraints as reported by farmers which included lack of grazing land, lack of veterinary care and services, high price and scarcity of feed and fodder, low price of milk, etc. Finally, policy implications of the study were suggested.

Rob (2010) conducted a study on market system for milk and dairy products – Bogra / Sirajgonj chars. Small-scale livestock farmers in the study area benefited from increased access to livestock service of LSPs trained by CLP and other NGOs. It was possible because the farmers were the main producer of milk, supporting them with livestock service was necessary to close the gap in value chain growth. However, due to low productivity, lack of knowledge and skills related to cattle management, unorganized milk market system, lack of quality control, mistrust and coordination the farmers are unable to get full benefit from the milk market.

Farmers' informal group in collaboration with LSP association can overcome production and quality related constraints. They also need to engage themselves in market analysis and dialogue with collector and processors for building a viable milk marketing system that addresses the issue of fragmented collection, quality control and price.

Mondal (2006) made a supply chain analysis of wholesale milk market in selected areas of Dhaka District. The average gross margin per day per dairy cow was estimated TK. 88 and net returns was calculated at TK. 79. The value addition by Beparis was estimated Tk 367, value addition by wholesalers was at Tk. 152 and value addition by sweet meat shops was at TK.1023 per 100 litre of milk. The study also revealed that the value addition of sweetmeat shop owners were higher than that of other intermediaries.

Shahnaz (2004) conducted a research on milk and milk products in Bangladesh. Bangladeshis are very fond of sweetmeat. In Bangladesh it is very common and prestigious feature to serve and consume dairy products as desserts in all festivals and occasions. Though milk production of Bangladesh is very low and a large part of population cannot afford milk, yet a huge number of dairy based sweet shops are located in every corner of the country. Various types of delicious traditional dairy products are available in the country. But the information and research on these products are scanty.

Amin (2000) studied on the marketing of milk in selected northern districts of Bangladesh. He found in his study that the productivity of dairy cow of the selected farms was 5.28 and 4.84 liter per day in Rangpur and Bogra, respectively. Marketed surplus for milk in Rangpur was higher (Tk. 96.97) than that of Bogra (Tk.96.087). Small farm in Rangpur got highest profit (Tk.1.34/liter) when they sold milk to retailers. They got lowest profit (Tk. 0.12/liter) from the sweetmeat shop owners.

At Bogra small farms earned the highest profit (Tk. 2.13/liter) when they sold packaged milk through their own sale centers. Medium farms earned a profit equivalent to Tk. 3.41 and Tk. 1.81 per liter from the sale centers and home service channels at Rangpur and Bagura, respectively. Large farms in both areas carried the highest profit (Tk. 3.47 and Tk. 3.07/liter) by selling through sale centers. All selected farms got lowest profit from sweetmeat shops. In Rangpur average margin to the retailers was higher (Tk. 1.33/liter) than that in Bogra (TK. 88/liter). At the two study areas milk traders got lowest margins from sweetmeat shops owners. The most efficient channel was MC1 (dairy farm-consumer at farm gate and for Bogra, dairy farm- urban consumer at home service) at both areas.

Tanjina (2009) studied the value chain of dairy sector in Rangpur district. Total cost per day per cow was estimated at Tk.108.66 and Tk. 106.06 and net returns were

calculated Tk. 93.62 and Tk.76.18 for independent and contract farm, respectively. The value addition of per liter of milk by milk producers, traders, processors, retailers was calculated at Tk. 14.39, Tk. 13.00, Tk. 24.00 and Tk. 4.33, respectively. The net margins obtained per liter of milk were Tk. 12.21, Tk. 7.86, Tk. 17.50, and Tk. 3.99 for milk producers, traders, processors and retailers, respectively. Expensive, inadequate and low quality feed, lack of grazing land, green grass, adequate capital, knowledge about cost effective feed production and extension services, high fees of veterinary doctor, irregular supply and high price of veterinary medicine and low price of milk were the major problems of milk producers. The study also identified some major problems of other value chain actors and probable solutions of the problems.

Boland (2002) conducted a study on the dairy product value chain. The study revealed that the value chain for dairy products extends from on farm production, through manufacturing and distribution, to the final consumer. Using an integrated approach across the value chain, it is possible to produce products that better suit consumer needs or preferences and the return more value to the farmers using on farm methods. This approach requires a change in mindset for the New Zealand manufacturing industry and can be successful only on industry that is fully integrated from cowshed to consumer.

Uddin *et al. (*2012) conducted a study on Small Scale Dairy Farming for Livelihoods of Rural Farmers. The study was conducted to explore the experiences of small-scale dairy producers in Barura, Comilla, Bangladesh, with the particular focus on the Small-scale dairy farming for livelihoods of rural farmers. The aim of the study was to determine the role of small scale dairy cattle farming in improving their life styles, identifications of the problems of dairy cow raising and to provide suggestions for

their improvement. A total of 100 farmers were selected where 40 were selected for small scale-dairy farming/households (SCD/SCH) and 60 for non-farming households (NFH). The Data were collected through face to face interviewing and personal visits. Results showed that farming system, breeding policy and veterinary services has significant ($p<0.01$) roles in production performances between the SCH and NFS and housing also has significant ($p<0.05$) contribution. There were no significant relation on other variables such as sex, age, marital status and education of the producer in production. The study showed that disease was the most important dilemma followed by unpredictable milk market and high prices of drugs for dairy farm income.

CHAPTER 3
METHODOLOGY

3.1 Introduction

Methodology is the essential and indispensible part of any research study. Without proper methodology very often leads to a defective result. The methodology of the study is adopted by various steps to select the best method fit to attain the set objectives of research (Mazumder, 2008). This chapter presents a detailed description about the study area, selection of the study area, selection of respondents, data collection procedure and analytical techniques followed in this study.

3.2 Selection of the study area

Keeping in mind the objectives of the study and considering the adjacent limitations only two thana namely Mohammadpur and Dhamrai under Dhaka district were purposively selected as study areas, since a considerable number of dairy farms were being operated in commercial basis and recently engaged in supplying packaged (unpasteurized) fresh milk to the urban markets through their own sale centers or the independent outlets which are operating their business, most of the cases centering on the residential areas of the towns. The area in which a farm business survey is to conduct relies on the particular purposes of the survey and possible cooperation from the respondent.

The reasons behind the preference of the study areas were:

- Comparatively higher concentration of high yielding crossbred dairy farms;

- Easily accessible and thus facilitate the researcher to complete the field work;
- Favorable for milk production and marketing;
- Scope of using different transport and way to communicate with the respondents. This was less expensive and less time consuming;
- Most of the farms are nearby to the road;
- No such study was conducted in this area.

Figure 3.1 Map of study area.

⭐ = Study area

3.3Samlpe size and sampling technique :

It is quite impossible to conduct an economic survey considering all popualtion of the study areas. The commercial dairy farrms operating within the metropoliatan areas and those farms operating either the area of sadar upazilla or operating outside the

sadar upazilla but using the town market for their produce were considered as the population for the present study. And milk processors and retailers within the metropolitan and sadar areas were considered as a population.Simple random sampling technique was used in sampling milk producer and milk traders from the population. The sample included thirty (30) producers and twenty (20) value chain actors (traders and service providers).

Table 3.1 Categories of milk producers

Location	No. of selected milk producers
Mohammadpur	15
Dhamrai	15
Total	30

3.4 Preparation of survey schedule

For achieving the desired objective, it is very important to prepare a draft survey schedule and pre-testing it in the survey area. Three types of draft survey schedule were pre-tested by researcher herself. The draft survey was conducted among 5 dairy and 5 intermediaries in selected areas. After this pre-test, the questionnaire was rearranged, improved and modified according to the practical experience and prepared it for final survey. After pre-testing, correction and modification final interview schedules were developed. Primary data were collected from the market actors including dairy farmers, intermediariesand service providers by using semi structured questionnaires. The questions were asked in a simple manner and concern with friendly environment with explanation where it was felt necessary.

3.5 Pattern of the questionnaire

A questionnaire is an important part of the research. After pre-testing the researcher herself improved and updated information of the questionnaire and then selected respondents were requested by the researcher to answer the questions. All of the questions were set according to the objectives of the study. To get the accurate answer

from the respondent the researcher formulated the questionnaire very carefully in Bangla. The questionnaire embodied the following parts:

A.   Questionnaire pattern for milk producers.

      i.   General information for milk producers

     ii.   Family information

    iii.   Location of the dairy farm and dairy herd size

    iv.   Credit information

     v.   Source, quantity and price of inputs and cost of collection.

    vi.   Selling price, selling person, selling place of a farmer.

   vii.   Cost of milk production

  viii.   Gross return from dairy cow (milk, cow dung, calf)

    ix.   Information about farm laborer

     x.   Constraints to milk producers and probable solutions.

Figure 3.2: Dairy Farm.

B. Questionnaire pattern for milk traders

   i.   General information about respondent.

  ii.   Business related information

 iii.   Marketing cost and margin

iv.   Constraints and solutions

C. Questionnaire pattern for service provider (Sweetmeat shopper)
  i. General information about service provider
 ii. Types of service
iii. Service charge
iv. Business related information
 v. Marketing cost and margin
vi. Constraints and probable solutions

Figure 3.3: Sweetmeat shop

3.6 Collection of data

Data collection is not an easy task. It must be done sincerely because a successful report depends on the reliable data. Data was collected according to the structured questionnaire and face to face interviews had been carried out following Paper and Pencil method. After fixing the survey schedule, the researcher herself stayed in the respective area and collected the primary data from individual households. Before beginning of the interview, the respondents were given a clear view and purpose of the study. The respondents were ensured that their information would be kept secret and be used only for the study. The questions were asked in a simple manner and explained when necessary. All data were recorded in interview period and information was checked carefully. The respondents were requested to provide accurate data as far as possible. Secondary information, especially with regards to supply chain, market actors, commodity flows, marketing costs and margins, price information on milk

production and marketing etc. were collected from thesis, books, journals, reports (BBS, BOS), documents and online resources.

3.7 Period of data collection

Data was collected during July to December in 2014 by the researcher herself. To measure the socio-economic and livelihood changes of the respondents a before (covering a period of six months) after comparison was made and data were collected accordingly.

3.8 Processing of data

The collected data was processed through editing, coding, tabulating and classifying on the base of the characteristics. For completing pre tabulation task, data were verified to eliminate errors, inconsistency or omission in data collection and to avoid irrelevant information. Data were classified, tabulated and analyzed to accomplish the objectives of the study. Data were presented mostly in the tabular form, because it was of simple calculation, widely used and easy to understand. Raw data were inserted in computer using the concerned software MS Excel.

3.9 Concept of value chain

The value chain as a tool for identifying ways to create more customer value. Every firm is a synthesis of activities that are performed to design, produce, market, deliver and support its product. The value chain identifies nine strategically relevant activities that create value and cost in a specific business. These nine value creating activities including four support activities (Kotler , 2002) are given bellow :

The Generic Value Chain:
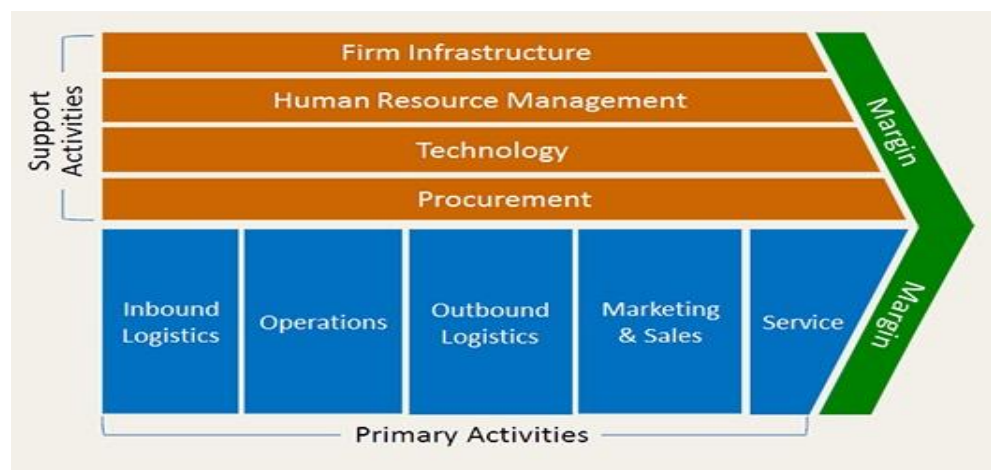
Figure 3.4The Generic Value Chain

Primary activities

Inbound logistics: Refers to goods being obtained from organizations suppliers ready to be used for producing the old product.

Operations: The raw materials and goods obtained are manufactured into the final product. Value is added to the production line.

Outbound logistics: Once the products have been manufactured they are ready to be distributed centers, wholesalers, retailers or customers.

Marketing and sales: Marketing must make sure that the product is targeted towards the correct customer group. The marketing mix is used to establish an effective strategy; any competitive advantage is clearly communicated to the target group by the use of the promotional mix.

Services: After the product / service have been sold what support services does the organization have to offer. This may come in the form of after sales training, guaranties and warranties.

Support activities
The support activities assist the primary activities in helping the organization achieve its competitive advantage. They include:

Procurement: This department must source raw materials for the organization and obtain the best price for doing so. For the price they must obtain the best possible quality.

Technology development: The use of technology to obtain a competitive advantage within the organization. This is very important in today's technologically driven environment. Technology can be used in production to reduce cost thus add value, or in research and development to develop new products, or via the use of the interest so customers have access to online facilities.

Human resource management: The organization will have to recruit, train and develop the correct people for the organization if they are to succeed in their objectives. Staff will have to be motivated and paid the market rates if they are to stay with the organization and add value to it over their duration of employment.

Firm infrastructure: Every organization needs to ensure that their finances, legal structure and management structure works efficiently and helps drive the organization forward.

So, the concept of value chain is defined as the entire range of activities required to bring a product from initiation, through various phases of production, to its final consumers

3.10 Analysis of data:

Data were analyzed with a view to achieving the objectives of the study. For this study, the following techniques were used:
  i) Tabular technique.
  ii) Cobb-Douglas production function model.

3. 10.1 Tabular technique

Tabular technique was applied to classify data in order to derive meaningful findings by using simple statistical measures like means, percentages and ratios.

3. 10.2 Evaluation of cost and return items

Following profit equation was used to assess the profitability of milk production. Net return is formulated by following formula:

$$\pi_i = (Pm_i.Q_i + Pw_i.W_i + Pdi.Di) - (TVC_i + TFC_i)$$

Where,

π_i = Net return from milk and other product from per cow per day;

Pm_i = Per unit price (Tk./liter) of milk production;

Q_i = Amount of milk production (liter/day/cow);

Pw_i = Per unit price (Tk./kg) of waste products;

W_i = Total quantity (kg) of waste products from dairy farming;

Pd_i = Per unit price (Tk.) of a calf of dairy farm;

D_i = Quantity of calves of dairy farm;

TVC_i = Total variable cost of milk production of per day per cow (Tk.);

TFC_i = Total fixed cost of milk production of per day per cow (Tk.);

i (1,2…..n) = Number of milk producer farmers.

3.10.3 Value addition by independent farmers

Value addition and marketing margin by farmers:

Gross Margin = Sales Price – Production Cost

Net Margin = Gross Margin – Marketing Cost.

$$Value\ Addition = \frac{Sale\ price - Production\ Cost}{Production\ Cost} \times 100$$

3.10.4 Value addition by the traders

Gross Margin = Sales Price – Purchase Price

Net Margin = Gross Margin – Marketing Cost.

$$Value\ Addition = \frac{Sale\ price - Purchase\ price}{Purchase\ price} \times 100$$

3. 10.5 Marketing efficiency analysis:

In the present study, Acharya'smethod was used for estimating Modified Marketing Efficiency (Acharya and Agarwal, 2004).

$$ME = \frac{FP}{MC + MM}$$

Where,

ME = Marketing efficiency.

FP = Net price received by farmers

MC= Total marketing cost

MM= Total net marketing margin of intermediaries.

A higher value of ME denotes higher level of efficiency and vice versa.

3.10.6 Technical efficiency analysis

I.   Regression model with Cobb-Douglas type function

The Cobb-Douglas was used here to determine the effect of key variables. To estimate the resource use efficiency for dairy farmers, the Cobb-Douglas (revenue function) model was carried out to the following form:

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} e^{ui}$$

The function was lineared by transforming it into following logarithmic (Double log) form :

$$lnY = lna + b_1lnX_1 + b_2lnX_2 + b_3lnX_3 + b_4lnX_4 + b_5lnX_5 + U_i$$

Where,

Y = Value of the average milk yield per cow per day (Taka);

X_1 = Value of labor used per cow per day (Taka);

X_2 = Value of paddy straw and green grass used per day per cow (Taka);

X_3 = Value of bran and pulses used per cow per day (Taka);

X_4 = Value of medicines used per cow per day (Taka);

X_5 = Utilities used per cow per day (Taka);

ln = Natural logarithm;

a = intercept/constant;

b_i = Production coefficients; and

U_i = Error term.

II. Marketing efficiency analysis

The resource uses efficiency of the farmers was judged on neo-classical criteria. Neo-classical theory states that in order to ensure maximum profit and efficiency of resource, resources must be utilized at the level where their marginal value product (MVP) is equal to their marginal factor cost (MFC) under perfect competition. The farmer would select the input level that maximizes the profit (TR-TC). In order to get this marginal value product, the coefficient of production elasticity is multiplied by the output-input ratio of the geometric mean level, which can be shown in the following formula.

$$MVP = b_i \frac{\overline{Y_i}}{\overline{X_i}}$$

Where,

b_i = Regression coefficient of respected inputs

$\overline{X_i}$ = Mean value (Geometric mean) of X_i variable inputs cost

$\overline{Y_i}$ = Mean value (Geometric mean) of gross return of milk production

In order to test this efficiency the ratio of marginal value product (MVP) to the marginal factor cost (MFC) for each input is compared and tested for its equal to one (1) i.e. MVP/MFC = 1 (Gujarati, 2007).

The resource is considered to be efficiently used as well as profit will be maximized in milk production when the ratio of MVP to MFC approaches one (1) or in other word MVP and MFC for each input are equal.

3.11 Problems faced in collecting data

At the time of data collection the researcher had to face some problems which are stated below:

❖ Most of the farmers had very little idea about research work. So it was difficult to explain the purpose of the study and to convince them about the need for the study.

❖ Farmers were afraid of imposition new taxes and they always tried to avoid in providing information relating to the actual size of holding, income acquired from dairy cow raising.

❖ Most of the respondents did not have enough time and interest to sit for the interview, because, they remained busy with their outside farm activities.

❖ The researcher had to depend on farmer's memory in order to collect information because most of them did not keep any written records on their farm business.

CHAPTER 4
SOCIO-DEMOGRAPHIC PROFILE OF DAIRY FARMERS AND MARKET ACTORS

4.1 Introduction

An attempt is made in this chapter to identify some socio economic characteristics of the dairy farmers and provide basic information on the areas of investigation. Decision making, enterprise combination, consumption pattern and employment status of different farm household would be influenced by their various characteristics. For this reason various information related to age, gender, family size, educational level, occupation, training, and source of fund and herd size of the farmers, other value chain actors have been taken into account in this study. This section provides the socio-demographic profile such as gender status of the households, age, family size, educational level etc. of the farmers and market intermediaries.

4.2 Socio-demographic characteristics of dairy farmers

4.2.1 Age of the dairy farmers

Age of dairy farmers play an important role in milk production and in better management of the farming activities. The major demographic factor such as age, measured in years, was analyzed to know the working age members of households. The age group of farm family members was classified into four categories in this study. These were: i) 20-35 years ii) 36-51 years iii) 52-67 years and iv) above 67 years. In the study area, 33 percent of total farmers belonged to the age group 20-35 years), 50 percent were in the age group of 36-51 years, 17 percent were in 52-67 years age group (Table 4.1).

4.2.2 Family size (persons per family)

A family size ranging between two to eight is witnessed in the farming households; the available data indicates that average family member in each family was 5 for

Mohammadpur's farms and 6 for Dhamrai's farms. So the average family size between these locations is 5.5 (Table 4.1). The existence of larger family size has positively influenced the generation of marketable surplus mainly to satisfy cash needs of the family members.

Table 4.1: Socio-demographic characteristics of dairy farmers.

Characteristics	n=30	Percentage
Gender		
Male (no.)	30	100
Female (no.)	0	0
Age group (yrs)		
20-35 yrs (no)	10	33
36-51 yrs (no)	15	50
52-67 yrs (no)	5	17
Above yrs (no)	0	0
Family size (person/family)	5.5	

Source: Field survey, 2014.

4.2.3 Land ownership of dairy farmers

In the study area, above 60 percent respondents have their own land for cow rearing. Only 40 percent of the respondents have rented land. Land ownership pattern directly affects the cost of milk production.

Table 4.2 Land ownership and educational level of dairy farmers

Characteristics	n=30	Percentage
Farm occupied land ownership		
Own land	18	60
Rent land	12	40
Educational level (no.)		
Illiterate	3	10
Class 1-5	10	33.33
Class 6-10	11	36.67
SSC	3	10
HSC	1	3.33
Graduation or above	2	6.67

Source: Field survey, 2014.

4.2.4 Educational level of dairy farmers

Education of the family members can contribute to ensuring food security at household level directly or indirectly. An educated person is much aware about nutrition, earnings etc. than an illiterate person. In the study area, 10 percent farmers are illiterate, above 6.67 percent of all dairy farmers had graduation degree or above, 33.33 percent respondents passed class five, 36.67 percent passed class six- ten, 10 percent completed their SSC and 3.33 percent completed their HSC (Table 4.2). This increased educational entitlement had supported the production and marketing of milk in the study area as well as this also helped to improve the ability to acquire new ideas in relation to market information and improved production of milk in the households.

4.2.5 Occupation of dairy farmers

The respondents depend on different income generating activities. Among them, occupation is mainly divided into two broad categories, primary and secondary. According to the this survey, around 56.7 percent respondent's main occupation was dairy milk business, 6.6 percent were service holder, 10 percent were job seeker , 16.7 percent's main occupation was agriculture. In the study area, around 43.33 percent respondents' reported that their secondary occupation was dairy milk business; 33.33 percent was involved in agriculture (Table 4.3).

Table 4.3 Occupational characteristics of dairy farmers

Characteristics	n=30	Percentage
Occupation (Main)		
Dairy milk business (no)	17	56.7
Service Holder (no)	2	6.6
Job seeker (no)	3	10
Agriculture (no)	5	16.7
Others (no)	3	10
Occupation (Secondary)		
Milk business (no)	13	43.33
Agriculture (no)	10	33.33
Others (no)	7	23.33

Source: Field survey, 2014

4.2.6Others information

It was observed that both Govt. institution and NGO's provide training facilities to the dairy farmers. It was found that 16.7% farmers had training on dairy farms and 83.3% farms had no training on dairy farm management. For establishing dairy farms,

83.3 % depended on their own source for capital and 16.7% on bank loans. The average capital investment on each cow was Tk.100000 to 2, 50,000. This study showed that out of 30 farms 3 farms had 20-30 herd size, 21 farms had 31-40 herd size, 5 farms had 41-50 herd size and only one farm had above 60 herd sizes. It was observed that the highest percent (70 percent) stay in (31-40) herd range of farm, 10% and 17% was in 20-30 and 41-50 herd size, respectively and only 3 % had above 60 herd size (Table 4.4).

Table 4.4 Training received, source of fund and herd size information

Characteristics	n =30	Percentage
Training received (no)		
Yes	5	16.7
No	25	83.3
Source of fund (no)		
Bank loan	0	
Own source	25	83.3
Both	5	16.7

Source: Field survey, 2014

Table 4.5 Farm Information

Herd size (Number)	No	Percentage
20-30	3	10
31-40	21	70
41-50	5	17
51-60	0	0
61-70	1	3

Source: Field survey, 2014

4.3 Socio-Demographic Characteristics of Market Intermediaries

4.3.1 Age of market intermediaries

The average age of the respondents of market intermediaries did not vary significantly in the study area. The analysis on this demographic characteristics highlighted that the average age of intermediaries was 35 to 45 (Table 4.6).

4.3.2 Educational level of market intermediaries

It is a crucial factor of skill development and enhancing marketing decisions. Literate people can have a better access to the relevant information regarding food and livelihood security. There is also a fact that education is correlated with higher levels of income which is associated with better level of earnings. The respondents reported that 100 percent of intermediaries (Faria, Bepari and retailer) are entitled to formal education (Table 4.6) except Faria . Around 75 percent of intermediaries have formal education and rest 25 percent were illiterate. The increased educational entitlement has supported the ability to acquire new idea in relation to market information and new technology.

Table 4.6 Socio-demographic characteristics of market intermediaries

Characteristics	Market intermediaries n =20		
	Faria (4)	Bepari (6)	Sweetmeat shopper(10)
1. Age (years)	35.25	43	45.2
2. Level of education			
Illiterate (no)	1(25)	0	0
Class (I-V) (no)	2(50)	2(33.33)	0
Class (VI-X) (no)	1(25)	2(33.33)	1(10)
SSC (no)	0	1(16.67)	3(30)
HSC (no)	0	1(16.67)	5(50)
Graduation or above	0	0	1(10)

Note: Figures in the parenthesis indicate percentages of total.
Source: Field survey, 2014

4.3.3 Business type

In the study area many intermediaries run their business on contract for a season or a year. Results showed that Faria run 25 percent contract business, rest 75 percent run sole business. Bepari and sweetmeat shopper run 50 and 70 percent sole business and partnership business, respectively. In the study area 30 percent sweetmeat shopper run their business on partnership (Table 4.7).

4.3.4 Experience of business

An analysis of experience of respondents indicates that only 10 percent of total intermediaries have above fifteen years of business experience. The analysis shows that 30 % sweetmeat shoppers had eight to eleven years of experiences and 10 percent had one to three years and another 10 percent's had four to seven years' experience. For three types of intermediaries, minimum to maximum years of experience ranged from 1 year to above 15 years (Table 4.7).

4.3.5 Selling point (location)

Selling point is a very important consideration for intermediaries, because of competition among intermediaries. Intermediaries also consider their marketing cost and profit when they sell their products. This study shows that Faria preferred town market most to sell their milk. Only Bepari sold milk to sweetmeat processors (Savar) and finally sweetmeat shopper sell their product in Dhaka city.

Table 4.7 Patterns of business of market intermediaries

Particulars	Market intermediaries n =20	Percentage

	Faria (4)	Bepari (6)	Sweet shopper(10)	of total
Business type				
Sole Business	3(75)	3(50)	7(70)	65
Partnership Business	0	0	3(30)	15
Contract Business	1(25)	3(50)	0	20
Experience on business				
1-3 years	2(50)	2(33.33)	1(10)	25
4-7 Years	2(50)	2(33.33)	1(10)	25
8-11 Years	0	2(33.33)	3(30)	25
12-15 Years	0	0	3(30)	15
Above 15 years	0	0	2(20)	10
Trading type				
Cash	2(50)	2(33.33)	8(80)	60
On credit		1(16.67)	0	5
advance	1(25)	1(16.67)	1(10)	15
Contract	1(25)	2(33.33)	1(10)	20
Source of Finance				
Own	3(75)	5(83.33)	9	85
Own +Bank			1	5
Own +relatives	1(25)	1(16.67)		10

Note: Parenthesis indicate that percentages of total.
Source: Field survey, 2014.

4.3.6 Trading type

It was observed that, Faria had done their transaction 50 percent in cash, 25 percent in advance and 25 percent on contract. Sweetmeat shopper practiced all types of transactions except credit transaction (Table 4.7).

4.3.7 Source of finance

Above 85 percent intermediaries' source of finance was own finance. Only 5 percent reported that they borrowed money from financial institutions like banks. Other 10 percent of total intermediaries borrowed money from their relatives (Table 4.7).

CHAPTER 5
PROFITABILITY, VALUE CHAIN AND VALUE ADDITION ANALYSIS OF MILK

5.1 Introduction

This chapter is basically concerned with identifying the actors of value chain to develop value chain map and also to examine the value addition by dairy farmers, milk traders and sweetmeat shop in a systematic way and also measure production, profitability and market efficiency in every stage of channels. Value addition is mainly regarded as the difference between total expenses involved in making or of a product and the total revenue accruing from its sales.This chapter goes through the existing market channel, the cost and returns at different levels that are incurred and obtained by milk producers, milk traders, sweetmeat shopper and finally the estimation of value addition at different levels and marketing efficiency.

5.1.1 Milk value chain

The analysis of value chain intended to provide a systematic knowledge of flow of goods and services from the origin (farmers) to the final destination (consumer). The milk market channels depicted in figure 5.1 was constructed based on the data collected in some selected areas in Dhaka district. The channel comparison was made based on percentage of volume that passed through each channel.

I.   **Farmer- Home delivery(Packed milk):** This channel represented 40 percent of total milk supplied to the neighbor's home as a packed form during the survey period (Table 5.1). The channel was found to be the first important supply chain in terms of importance.

II. **Farmer – Customer (local) channel:** This channel signified30percent of total milk supplied as a raw milk form. It is collected by neighbors, staff etc. (Table 5.1).

III. **Farmer – Faria(local) – Bazar – Customer (local):** It represented 10 percent of total milk supplied to market (Table 5.1).

IV. **Farmer – Milk trader – Sweetmeat Shop – Customer:** It accounted 20 percent of total milk supplied to far distant market and placed third most important channel in the district (Table 5.1).
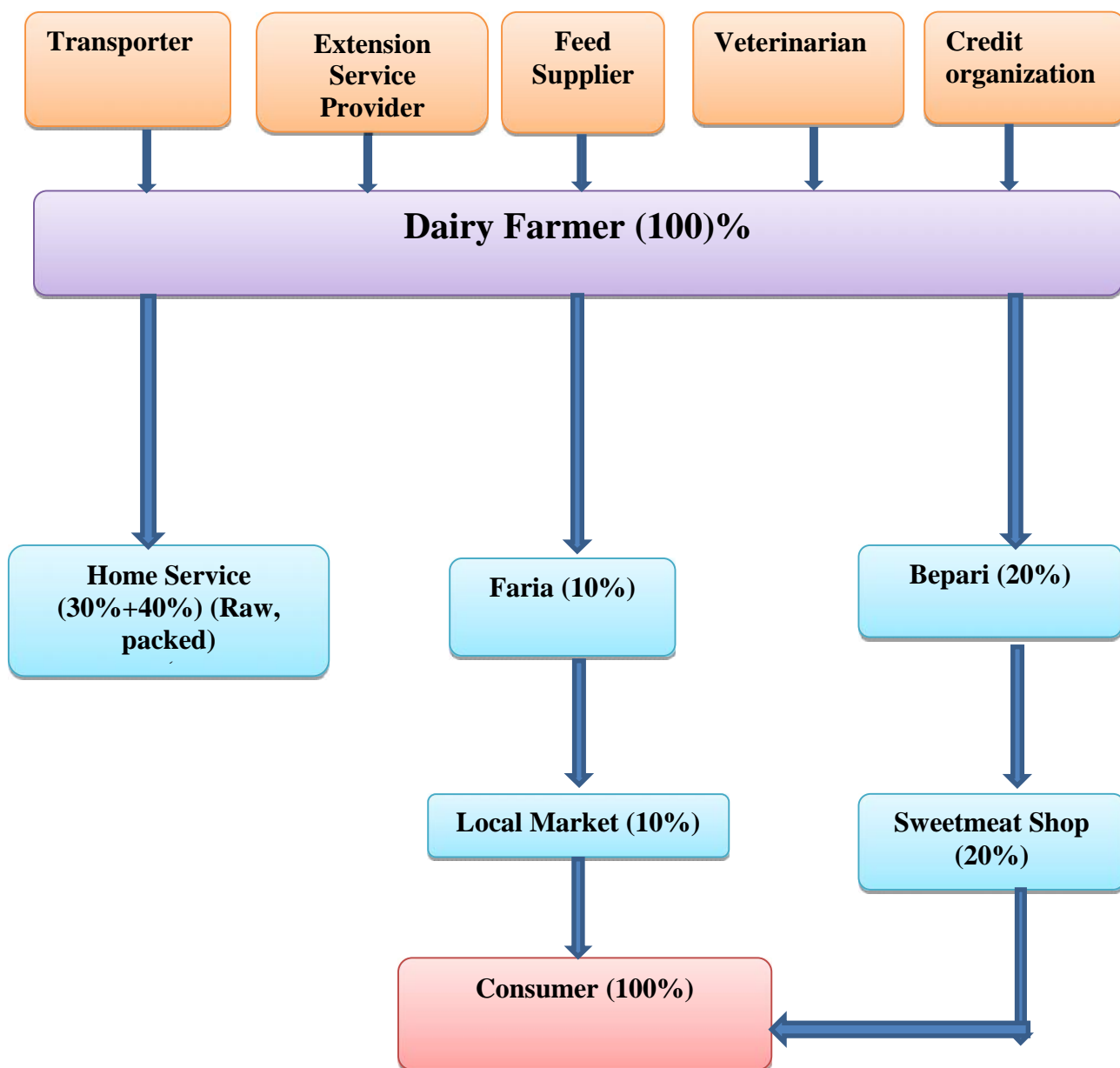
Figure 5.1 Existing value chain map of dairy milk in Dhaka district. % of product run in each chasing .

Table 5.1 Delivery of milk per day per cow

Channel	Milk amount per day per cow	Percentage (%) of total
Farmer - Home delivery	4	40
Farmer – Customer (local)	3	30
Farmer – Faria(local) – Local Market –	1	10

Customer (local)		
Farmer – Milk trader – Sweetmeat Shop – Customer	2	20
Total	10	100

5.1.2 Value chain actors

The value chain actors summarize all individuals, enterprises, and public agencies related to value chain, in particular the operational service provider, operators, and support service providers. The roles and relationship of major actors involved in the dairy chain are as below:

5.1.2.1 Operational service provider

Typically the operators of dairy value chain in Dhaka district include farmers, faria, bepari, sweetmeat shopper. They have in common that they become owners of the (raw, semi processed or finished) product at one stage in value chain. The operational service providers are being subcontracted by the value chain operators. One of the important service providers in the study area was farm laborers.

I. **Dairy farmers**

Dairy farmers are the primary and first link actor who plays an important role in the dairy value chain. Dairy farmers in the study area were the milk producer who produced milk independently and sold them to the neighbors either in raw form or in packed form and also sold raw milk to Faria, Bepari. They do not supply milk to more distant consumer.

II. **Farm laborer**

Only male laborer was involved in operational services of dairy sector. As it was observed in the study area there were two categories of farm laborers, monthly paid labor and causal labor.

III. **Faria**

Faria/ Dhudhwala are the persons who buy milk from the dairy farm and sold it to the market in a raw form.

IV. **Bepari**

They are small intermediaries who have no fixed establishment and staff. They purchase milk from milk producers at the farm gate and sold them to super shop or sweet processor plant which is owned by sweetmeat shopper.

V. **Sweetmeat shop**

Those who were involved with processing milk they personally purchased from Bepari and made processed product and sold it to local market or supply to other customers.

VI. **Consumers:** From the consumer's point of view, the shorter the marketing chain, the more likely is the retail price going to be affordable. Consumers for this particular study mean those households who bought and consume milk. They are

individual households; they bought the commodity for their own consumption only.

5.1.2.2 Support service provider

Like the operational services, support services do not directly support the basic function in a value chain. Instead, they refer to general investment and preparatory activities benefitting all or at least several value chain actors simultaneously. Support service therefore provides a collective good shared by the value chain actors. The support service providers in the value chain of dairy sector were extension service provider, transporter, feed/ fodder providers, credit organization, veterinarian etc.

I.   Extension service provider

The DLS and NGOs were generally the extension service providers in the study area. They trained the dairy farmers on dairy management, animal health care, sanitation, and marketing techniques of milk.

II.   Transporter

Transportation is the act of moving something from one location to another. Farmers used their own vehicle to transport milk. Bepari primarily used contractor's vehicles or farmers vehicles. Van, trolley, pickup van, rickshaw and bicycle were used as vehicle in the dairy value chain.

III.   Feed/ fodder providers

Various types of feed had been used in dairy rearing such as green grass, straw, rice bran, wheat bran, oilcake etc. in the study area. These feeds were supplied by the dairy feed dealers or wholesalers who were getting dairy feed either from the feed mills or any other sources of raw material supplier. The milk producers purchased green grass and straw from nearby green grass suppliers and paddy straw suppliers.

IV.   Credit organization

Other major support service providers are credit organizations. They are BRAC, ASA, BKBprovided credit for dairy farming or dairy related activities. They also provide some other services such as training to farmers, technical services, information related to selling, etc.

V.   Veterinarian

A veterinarian or a veterinary surgeon, often shortened to vet, is a physician and practitioners of veterinary medicine. In the study area veterinarians mainly –

- ❖ Diagnose animal health problems
- ❖ Vaccinate against disease
- ❖ Medicate animal suffering from infections or illness
- ❖ Perform minor to complex surgery and
- ❖ Advice owners about animal feeding behavior and breeding.

5.2 Cost and return analysis of milk producers

5.2.1 Cost of rearing dairy cows

Production   cost has an important effect on the decision of farmers. Table 5.2 shows the total cost per day per cow and also per liter per day. The total cost per day per cow

was estimated at Tk. 378.89. Hence variable cost and fixed cost were calculated separately. Average variable cost was Tk. 338.43 and average fixed was Tk. 40.46. The major cost was projected item wise which are discussed below:

5.2.1.1 Variable cost

The variable costs are the cost of consuming variable inputs. These costs vary with the level of production. These costs are discussed below:

I. **Feed cost**

    Feed cost was one of the major cost items of rearing dairy cows. Cost of feed includes expenses on paddy straw, green grass, oilcake, bran (rice, wheat, and pulses), broken rice, salt etc. Feed cost shared 69.76 percent. Among various feed items bran and green grass were the most important for dairy cow and their shares were 36.76 and 13.199 %.

II. **Labor cost**

    Labor cost is an important cost of dairy raising and it has implication on income and employment generation. In order of importance, the labor cost comes next to feed cost. It appeared from Table 5.1 that labor cost per day was estimated at Tk. 62.5 and its share of total cost was 16.49 %.

Table 5.2 Total rearing cost per day per cow

Cost Items	Tk./Day/Cow	Percentage of total
Variable cost		
A. Feed cost	264.32	69.77
1. Paddy straw	12.5	3.3
2. Green grass	50.01	13.2
3. Oilcake	5.73	1.51
4. Bran	139.29	36.76
5. Broken rice	6.72	1.77
6. Pulses	31.25	8.25
7. Molasses	17.29	4.57
8. Salt	1.53	0.40
B. Labor cost	62.5	16.49
C. Veterinary cost	3.36	0.89
D. Electricity cost	7.14	1.88
E. Miscellaneous cost	1.11	0.29
Total Variable Cost (TVC)	**338.43**	89.32
A. Water pump	0.21	0.055
B. Housing cost	1.2	0.32
C. House rent cost	19.05	5.03

D. Cost of capital	20.00	5.28
Total Fixed cost (TFC)	**40.46**	10.68
Total Production cost	378.89	100
Production cost Tk./Liter	37.89	

Source: Field survey, 2014.

III.   Veterinary cost

Veterinary costs were considered by taking into account the actual cost incurred by the farmers. Doctor's fees and medicine were two major components of the total veterinary cost. The total veterinary cost per day per dairy cow amounted to Tk. 3.36 and comprising 0.89% of the total cost.

IV.   Electricity cost

Electricity was very essential for maintaining light, temperature in the dairy house and also the water supply in the dairy house. The average electricity cost per day per cow was estimated at Tk. 7.14, which is accounted 1.88 % for total cost.

V.   Miscellaneous cost

Miscellaneous cost included some minor items like feeding troughs, ropes, milking equipment, mosquito coil, spade, basket, clip etc. Miscellaneous costs per day per cow were Tk. 1.11 for a farm and their share was 29 % to total cost.

5.2.1.2 Fixed cost

Fixed costs are those do not change in magnitude as the amount of output of the production process changes and are incurred even when production is not undertaken. Fixed cost included cost of water pump, housing cost and capital cost.

I. Housing cost

For dairy farm, construction of farm house is a significant part of the   production cost. The purpose of the housing is to protect dairy cows from sunshine, rainfall, storm, cold and also for comfort. Farmers used to keep their cows in the tin shed and pacca floor. The cost of housing was calculated by taking into account the depreciation, repairing, and interest on average value of the house.

Depreciation was calculated using the so called straight line method, in which the rate of depreciation is constant for the entire working life of the capital assets. In this method, the depreciation during each period is the same.

The amount of depreciation to be changed during a year was worked out as follow:

$$\text{Depreciation} = \frac{\text{Original Value} - \text{Salvage value}}{\text{Life Span}}$$

Here straight line method was used because in case of dairy farm this method is highly used for its easy calculation.

$$\text{Interest on Average Value} = \frac{\text{Begining value} - \text{End value}}{2} \times \text{Interest rate}$$

Beginning Value = [Original value – (Annual depreciation × Present age)]

End value = Beginning value –Annual depreciation.

Interest rate was assumed to be 10 percent per annum. The housing cost comprised about Tk. 1.2 Which shared .32 % of total cost.

I. Cost of water pump

Cost of water was calculated in the same way as housing cost. The cost of water pump per day per cow shared .055 % of total cost.

II. Capital cost

Capital cost was measured in the present study as the interest on average value of used capital of dairy cows. It was assumed that dairy cow owners had purchased the cow at the beginning of the year and sold it after one year. The interest on average value of used capital was calculated at the rate of 10 percent per annum. The cost was calculated by the following formula:

$$\text{Capital cost} = \frac{\text{Begining value} - \text{End value}}{2} \times \text{Interest rate}$$

Capital costs per day per dairy cow were Tk. 20 which shared 5.28 % of total cost.

5.2.2 Returns from dairy cow
The purpose of this section was to determine gross returns, gross margin and net returns per day per cow. The returns from dairy cow included returns from milk production, cow dung and calf.

5.2.2.1 Gross return

The gross returns of dairy cow were calculated on the basis of the average quantities of milk yield per cow and average price received per liter of milk. Returns from cow dung were found out by taking average price by which cow dung sold in the study area. Lastly the returns from calf were calculated by dividing the value of calf with the age of calf. It was assumed that dairy cow owners sold calf after one year. Table 5.3 shows total gross return was Tk. 693.5.
Table 5.3 Gross return per day per cow.

Particulars	Amount (liter)	Price (Tk/unit)	Gross return (Tk/Day/Cow)	Percent
Milk (L/Day/Cow) - Home	3	65	195	28.12
Milk (L/Day/Cow) - Home Delivery	4	68	272	39.22
Milk (L/Day/Cow) - Faria	1	62	62	8.94
Milk (L/Day/Cow) - Bepari	2	55	110	15.86
Cow dung (Kg/Day/Cow)	5	0.5	2.5	0.36
Calf (Tk./Day)			52	7.50
Total Return			693.5	100.00

I.   **Gross returns from Milk - Home (Raw sale+Consume+Discount+Staff)**

Gross return from Milk (L/Day/Cow) - Home (Raw sale+Consume+Discount+Staff)per day per was TK. 195 for a dairy cow and 28.12 % of total returns.

II.   **Gross returns from Milk - Home Delivery Pack**

Gross returns from Milk (L/Day/Cow) - Home Delivery Pack per day was Tk. 272 for a dairy cow which was 39.22 % of total return.

III. **Gross returns from Milk – Faria**

Gross returns from Milk (L/Day/Cow) – Faria per day per dairy cow was Tk. 62 for a dairy cow which was 8.94 % of total return.

IV. **Gross returns from Milk – Bepari**

Gross returns from Milk (L/Day/Cow) – Bepariper day per dairy cow was Tk. 110 for a dairy cow, 15.86 % of total return.

V. **Gross returns from cow dung**

The average gross return from cow dung from per dairy cow per day was Tk. 2.5 which is 0.36 % of total return.

VI. **Gross returns from calf**

Gross return of calves per day was Tk. 52 which 7.5 % of the total returns from farm.

5.2.2.2 Gross margin

In this study gross margin was calculated by deducting variable costs from gross return. Table 5.3 shows that the average gross margin per day per dairy cow was Tk. 355.07.

5.2.2.3 Net return

Net return is defined as the difference between gross returns and total cost. Table 5.3 shows that average net return was Tk. 308.55 per day per dairy cow. Net return per liter of milk was Tk. 30.86.

Table 5.4 Gross margin and net return per day per dairy cow

Particulars	Tk./Day/Cow
a) Gross return	693.5
b)Variable Production cost	338
c) Fixed Production cost	40
Production Cost	379
Marketing cost	6.06
d) Total cost (Production +Marketing)	384.95
e) Gross margin (a-b)	355.07
f) Net return (a-d)	308.55
g) Net return (per liter of milk)	30.86
h) Return on cost {(f/d)*100}	80.15%
i) BCR (a/d)	1.80

5.2.2.4 Return on cost

Return on costs was calculated by dividing the net return by total cost and expressed it as a percentage form. The return on costs was calculated at 80.15.percent.

5.2.2.5 Benefit Cost Ratio

The BCR (undiscounted) is a relative measure which is used to compare benefits per unit of cost. The BCR of a dairy cow was calculated as a ratio of total returns and total cost. Table 5.4 shows that benefit cost ratio of dairy cow was emerged as 1.80 implying that TK. 1.80 would be earned by spending Tk. 1.00 in dairy farming indicating that investment in dairy farming would be profitable.

5.3 Value addition

Value added is the total sales of a firm minus purchases of inputs from other firms. What is left is available for the wages of its employees and the profit of its owners (Black, 2008 p. 492). The difference in the price at the firm level (price received by the farmer) and that retail level (paid by the consumer) may be used to value added (Acharya and Agarwal, 2004, p.3888).

When any product creates utility then it adds value. Marketing margin at a particular stage of product flow can be defined as the difference between purchase price and sales price of a commodity. On the other hand, marketing margin refers to the difference in value for equivalent physical quantities of a given commodity between different stages of marketing. In broad sense, marketing margin is the difference between what is paid by the consumers and what is received by the producer. It is the price of all utility adding activities and function that are performed by the intermediaries (Kohls and Uhl, 2005, p.8).

5.3.1 Value addition analysis of milk producers

In the study area some producers sell their product after packaging. Different activities of selling the locally packaged milk of milk producers, added values of milk.

5.3.1.1 Marketing cost

The marketing cost represents the cost of various marketing function and the operation by various agencies involved in marketing process. In other words, the costs which are incurred to move the product from purchasers to consumers are ordinarily known as marketing cost.

5.3.1.2 Marketing cost of milk producers

Some producers sell their product after packaging. In case of local packaged milk, milk producers usually perform the function of packaging, transportation and then selling to consumers. The cost involved in performing those function were mainly packaging cost (labor, polythene, branding and electricity), transportation cost and cost of cost of milk container. The average cost of marketing of milk incurred by milk producer was TK. 6.06 per liter (Table 5.5).

Table 5.5 Marketing cost spent by farmers for home-based milk packet delivery to consumer

Cost items	Cost per liter of milk (Tk.)	Percentage of total cost
a) Labor	0.5	8.25
b) Polythene	0.75	12.38
c) Branding	0.42	6.93
d) Electricity	0.33	5.45
Total Packaging cost	2	33.00
f) Transportation cost	2.5	41.25
g) Milk container	1.56	25.74
Total marketing cost	6.06	100.00

Source: Field survey, 2014.

The highest cost component was packaging cost which accounted for TK. 2 per liter of milk and this represents 33 percent of total costs. Within the packaging costs polythene cost was the highest. The polythene cost was Tk. 0.75 per liter of milk. The second item was the transportation cost which was TK. 2.5 and shared 41.25 percent of total cost. Another cost item was the cost of milk containers at Tk. 1.56 and shared 25.74 percent of total cost.

5.3.1.3 Value addition by dairy farmers

Value addition by milk producers is shown in Table 5.6. The production cost of milk producers was Tk. 37.98 per liter of milk and it was sold at Tk. 68 to the neighbors in the study area. Thus gross margin was Tk. 30.11 per liter of milk. The total cost of milk producers was Tk. 39.40 per liter of milk. The total marketing cost of milk was Tk. 1.515 per liter of milk. So, the value addition by milk producers was estimated at Tk. 28.60 per liter of milk.

Table 5.6 Value addition in home delivery milk supply

Particulars	Tk/L/Day/Cow
a) Production cost	37.89
b) Marketing cost	1.515
Total cost	39.40
c) Sales price of local packaged milk	68.00
d) Gross margin (c-a)	30.11
e) Market Margin/Value Addition (d-b)	28.60
f) Return on cost (%) {e/(a+b)}	72.57

Value addition = Sales price –Production cost.

5.3.1.4 Return on cost
The return on cost was calculated at 72.57 percent in case of packaged milk.

5.3.2 Value addition analysis by Faria
Milk traders also involved in value addition of milk. They did it through transportation. In the study area Farias were termed as "Dudhowala.'' The value addition by Farias is estimated below:

5.3.2.1 Marketing cost of Faria
Faria sold their milk to consumers at market place. After collecting milk from milk producers they sold it to the end users. Table 5.7 depicts that the average estimated marketing cost per liter of milk incurred by Farias was Tk. 2.38. Among the cost items, labor cost covered the highest cost representing 46 percent of total cost. The second highest cost item was transportation cost which accounted for 42 percent of total cost. Among the different cost items milk container, market toll, others (gift and grants, spoilage), personal expense were Tk. 0.02 ,Tk. 0.10, Tk. 0.06, Tk. 0.10 which shared 1 percent, 4 percent ,3 percent,4 percent respectively.

Table 5.7 Marketing cost of Faria

Cost Items	Average cost per liter per day (Tk.)	Tk/100 L/Day	Percentage (%)
a) Transportation	1.00	100	42
b) Labor	1.10	110	46
c) Milk container	0.02	1.50	1
d)Market toll	0.10	10	4
e) Others (gift and grants, spoilage)	0.06	6	3
f) Personal expense	0.10	10	4
Total	2.38	237.5	100

Source: Field survey, 2014.

5.3.2.2 Value addition by Faria

Value addition by Faria is depicted in Table 5.8. The average purchase price of Faria was Tk.62 per liter of milk and the average sales price was Tk.66 per liter. So, the value addition was Tk. 4 per liter. The total marketing cost of Faria was Tk.2.38 per liter and gross margin was Tk.4. So the net margin by Faria was Tk.1.63 per liter. The return on cost of Faria was estimated 2.5 percent.

Table 5.8 Value addition by Faria

Item	Average cost Tk/L/Day	Tk/100 L/Day
a. Milk Purchase	62	6200
b. Marketing cost	2.38	237.5
c. Total cost	64.38	6437.5
d. Sales price	66.00	6600
e. Gross margin (d-a)	4.00	400
f. Market Margin/Value Addition (e-b)	1.63	162.50
g. Return on cost (%) {f/(a+b)}	2.5	

Source: Field survey, 2014.

5.3.3 Value addition analysis by Beparies
Bepari added value by selling milk to super shop or sweetmeat processing plant under sweetmeat shop after the collection of raw milk from farmer.

5.3.3.1 Marketing cost of Bepari
Table 5.9 depicts that the average estimated marketing cost per liter of milk incurred by Beparies was Tk. 2.47. Among the cost items, transportation cost covered the highest cost representing 41 percent of total cost. The second highest cost item was labor cost which accounted for 32 percent of total cost. Among the different cost items milk container, market toll, others (gift and grants, spoilage), personal expense were Tk. 0.02 ,Tk. 0.40, Tk. 0.10, Tk. 0.15 which shared 1 percent, 16 percent ,4 percent,6 percent respectively

Table 5.9 Marketing cost of Bepari

Cost Items	Average cost Tk./L/Day	Tk./100 L/Day	Percentage (%)
a. Transportation	1.00	100	41
b. Labor	0.80	80	32
c. Milk container	0.02	1.8	1
d. Market toll	0.40	40	16
e. Others (gift and grants, spoilage)	0.10	10	4
f. Personal expense	0.15	15	6
Total	2.47	246.8	100

Source: Field survey, 2014.

5.3.3.2 Value addition by Bepari

Value addition by Beparies is depicted in Table 5.10. The average purchase price of Bepari was Tk.55 per liter of milk and the average sales price was Tk.60 per liter. So, the value addition was Tk. 5 per liter. The total marketing cost of Bepari was Tk.2.47 per liter and gross margin was Tk.5. So the net margin by Bepari was Tk.2.53 per liter. The return on cost of Bepari was estimated 4.4 percent.

Table 5.10 Value addition by Bepari

Item	Tk/L/day	Tk/100 L/Day
a. Milk Purchase	55	5500
b. Marketing cost	2.47	247
c. Total cost	57.47	5747
d. Sell price	60	6000
e. Gross margin (d-a)	5.00	500
f. Market Margin/Value Addition (e-b)	2.53	253
g. Return on cost (%) {f/(a+b)}	4.40	

5.3.4 Value addition analysis by sweetmeat shopper

5.3.4.1 Production cost of sweetmeat

Sweetmeat production plant under sweetmeat shop purchase milk from Beparies. Then they process milk for various sweetmeat items. Sweet meat shop make roshagolla, kachagolla, shandesh, danadar, and curd etc. In the study area twenty Kg channa was made from 100 liter of milk. Production cost of sweetmeat includes milk cost, sugar, flour, fuel, rent, labor and other cost. The average cost of marketing incurred by sweetmeat shops for 100 liter of milk was estimated to Tk. 9548.33 (Table 5.11).

Milk cost on average incurred by sweetmeat shops was reported to be Tk. 6000 per 100 liter of milk. This cost component represents 62.83 percent of total cost. It was the highest cost component. Sugar cost was reported as Tk.933 per 100 liter of processed milk which was 9.77 percent of total cost. Flour cost was reported as Tk. 26 per 100 liter of processed milk which was 0.27 percent of total cost. Fuel, labor and rent were calculated as Tk. 145, Tk. 150, Tk. 125 per 100 liter of processed milk which was 1.51 percent, 1.57 percent, 1.31 percent of total cost, respectively.

Table 5.11 Production and marketing cost of milk product by the ingredient using 100 liter milk

Milk Product	Roshagolla	Kachagolla	Shandesh	Danadar	Curd	Total
Milk used (Liter)	21	24	24	14	17	100
Milk (Tk.)	1260	1440	1440	840	1020	6000 (68.83)
Sugar (Tk.)	420	52	104	252	105	933

						(9.77)
Flour (Tk.)	8	5	10	3		26 (0.27)
Fuel (Tk.)	30	35	35	20	25	145 (1.51)
Rent (Tk.)	27	30	30	18	20	125 (1.31)
Labor (Tk.)	32	36	36	21	25	150 (1.57)
Transportation (Tk.)	32	36	36	21	25	150 (1.57)
Electricity (Tk.)	14	16	25	9	15	79 (0.83)
Packaging (Tk.)	112	56	56	72	104	400 (4.19)
Other fixed cost (Tk.)	355	290	309	138	390.33	1482.33 (15.52)
Others (Tk.)	10	4	20	20	4	58 (0.61)
Total cost (Tk.)	2300	2000	2101	1414	1733.33	9548.33

Source: Field survey, 2014.
Note: Figures in the parenthesis indicate percentage of total cost;
Other cost indicates cost of personnel expenses, electricity cost.

5.3.4.2 Gross returns of sweetmeat shops

The gross return from sweetmeat shops included returns fromroshagolla, kachagolla, shandesh, danadar and curd. The gross return of roshagolla,kachagolla, shandesh, danadar and curd was 14kg, 7 kg,7 kg, 9 kg, 13 kg from 100 liter of milk which was accounted by Tk.3220 , Tk. 2800, Tk. 3150, Tk. 1980, Tk. 2600respectively and 23.42 percent, 20.36 percent, 22.91 percent, 14.4 percent, 18.91 percent of total cost, respectively. The total gross return from 100 liter of milk was 13750 taka.

Table 5.12 Gross return of sweetmeat shops from different milk products (per 100 liter of milk)

Milk Product	Unit	Sweet (Kg)	Sale Price (Tk)	Gross return (Tk)	Percentage of total
Roshagolla	Tk/kg	14	230	3220	23.42
Kachagolla	Tk/kg	7	400	2800	20.36
Shandesh	Tk/kg	7	450	3150	22.91
Danadar	Tk/kg	9	220	1980	14.4
Sweet Curd	Tk/kg	13	200	2600	18.91
Total				13750	100

5.3.4.3 Value addition by sweetmeat shop

Value addition by sweetmeat shops as found is shown in Table 5.13. Value addition from roshagolla was Tk. 920 while value addition from kachagolla, shandesh, danadar and curd was Tk.800 Tk , Tk. 1049, Tk. 566, and Tk. 866.67, respectively.

The total return of sweetmeat shops from different milk products (per 100 liter of milk) were Tk.13750   and total marketing and production cost of sweetmeat shops was Tk. 9548.33.So the value addition of sweetmeat shops was estimated at Tk.4201.67.

Table 5.13 Value addition by sweetmeat shops from different milk products (per 100 liter of milk)

Milk products	Return (Tk)	Marketing cost (Tk)	Value addition (Tk)
Roshagolla	3220	2300	920
Kachagolla	2800	2000	800
Shandesh	3150	2101	1049
Danadar	1980	1414	566
Curd	2600	1733.33	866.67
Total	13750	9548.33	4201.67

So, value addition for per liter of milk is 4201.67/100 = 42.01 taka**.**

5.4 Marketing efficiency analysis

The marketing system is considered as efficient if the movement of goods from producers to consumers is taken under the lowest cost consistent with the provision of services and facilities that consumer desire and is able to pay for. Lower marketing costs are generally considered as indicator of higher efficiency in marketing. A rise in efficiency in form of low/fall in marketing costs may result in one of the following possibilities:

    I. Rise in revenue to the farmer

    II.   Fall in price to the consumer

    III.   Rise in profit to the middlemen.

In the present study, Acharya's method was used for estimating Modified Marketing Efficiency (Acharya and Agarwal, 2004).

$$ME = \frac{FP}{MC + MM}$$

Where,

        ME = Marketing efficiency.

        FP = Net price received by farmers

        MC= Total marketing cost

        MM= Total net marketing margin of intermediaries.

A higher value of ME denotes higher level of efficiency and vice versa.

Table 5.14 Value addition for per liter of milk by following value chain actors

Particulars	Value addition(Taka)

Farmer	**28.6**
Faria	**1.63**
Bapari	**2.53**
Sweet shop	**42.01**

Table 5.15 Measurement of marketing efficiency of milk marketing (Tk./liter)

Particulars	Value chain-I (Consumer)	Value chain – II (Faria)	Value chain –III (Bepari)
1. Price received by the Farmers (FP)	68	62	55
2. Total marketing cost (MC)	1.52	2.38	2
3. Total Net marketing margin (MM)	28.6	1.63	2.53
4. Marketing Efficiency (FP/MC+MM)	2.26	15.5	12.14

Farmers received 68 Tk. Per liter of milk for packed milk due to packaging cost. They received Tk. 62 per liter of milkfromFaria because Faria buys amass amount of milk. Farmers received 55 taka per liter to Bepari because it is contracted and fixed business where Bepari sells amass amount of milk to sweetmeat shopper.

Considering three value chain on the basis of product flow it was found that value chain-II is more efficient than value chain-I and value chain-III. Consumer paid lower price in value chain-II compared to value chain-III andvalue chain-I (Table 5.15).

CHAPTER 6
PRODUCTIVITY AND RESOURCE USE EFFECIENCYOF
DAIRY FARMING

6.1 Introduction

In the preceding chapter the tabular method was employed to observe the contribution of using various factor inputs to net return. The focus of the present chapter is to make quantitative analysis of milk production in the framework of production function analysis. The analysis is expected to provide a more clear view about the resource use efficiency and productivity situations.

6.2 Factors affecting production of milk

In the study area for production of milk the following inputs namely labor, paddy straw and green grass, bran and pulses, veterinary services and medicines, utility etc. are employed which were considered as a priori explanatory variables and these explanatory variables were considered to be mostly responsible for producing milk. Cobb-Douglas (Double log) production function model was initially estimated to understand the possible relationship between the production of milk and the level of inputs used.

6.3 Functional relationship of dairy farming

This section makes an effort to accomplish a functional analysis of dairy milk production. It is expected to be a compromise among

    (i) adequate fit of the data ;

    (ii) computational feasibility; and

    (iii) sufficient degrees of freedom unused to allow for statistical testing with the help of samples.

To explore the effects of variable inputs, both linear and Cobb-Douglas production function models were estimated initially. The result of Cobb-Douglas model appeared to be superior on theoretical and econometric grounds.

So the Cobb-Douglas production function was chosen for the regression under ordinary least squares (OLS). The coefficient understands this specification for production elasticity demonstrates whether the production process as a whole yields increasing, constant or decreasing returns to scale.

Cobb-Douglas production function analysis was done taking into account 30 dairy farmers. The model was specified as:

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} e^{ui}$$

In the linear form it can be written as :

$$\ln Y = \ln a + b_1\ln X_1 + b_2\ln X_2 + b_3\ln X_3 + b_4\ln X_4 + b_5\ln X_5 + U_i$$

Where,

Y = Value of the average milk yield per cow per day (Taka);

X_1 = Value of labor used per cow per day (Taka);

X_2 = Value of paddy straw and green grass used per day per cow (Taka);
X_3 = Value of bran and pulses used per cow per day (Taka);
X_4 = Value of medicines used per cow per day (Taka);
X_5= Utilities used per cow per day (Taka);
ln = Natural logarithm;
a= intercept/constant;
b_i = Production coefficients; and
U_i = Error term.

6.3.1 Discussion of result from the model

The parameter estimates of the production functions for dairy milk production are presented in Table 7.1.

Principal characteristics of a model are noted below:

i) F-values used to measure the goodness of fit for different types of input.

ii) The Co-efficient of multiple determinations indicated the total variations of output explained by the independent variables included in the model.

iii) Coefficients having sufficient degrees of freedom were tested for significance level of 1 percent and 5 percent probability levels.

iv) Stages of production were estimated by returns to scale which were the summation of all production elasticities of various inputs.

Table 6.1 Estimated values of co-efficient and related statistics of Cobb-Douglas production function

Item	Coefficient	t- value	P- value	MVP/MFC
Intercept (a)	5.615***	2.855	.007	
Human labour (X_1)	0.372**	2.094	0.044	1.058
Straw and green grass (X_2)	-0.065	-1.032	0.309	-0.68
Bran and Pulses(X_3)	0.004**	2.224	.031	1.098
Medicine (X_4)	0.271***	3.740	0.000	3.639
Utilities (X_5)	0.023**	2.099	0.043	2.771
R^2	0.694			
F- value	14.07***			

Note: *** and ** indicate significant at 1% and 5% level, respectively
MVP = Marginal Value Product
MFC = Marginal Factor Cost
Source: Author's calculation (2014).

6.3.2 Interpretations of the results

Estimated values of the coefficient and related statistic of the Cobb-Douglas production function model of dairy cows are shown in Table 7.1. The following features are noted.

Labor cost (X_1)
The regression co-efficient for the labor input was significant at 5 percent level for dairy cows. This implied that 1 percent increase in labor cost, keeping other factors constant, would significantly increase the milk yield by 0.372 percent.

Paddy straw and green grasses (X_2)
The regression coefficient of the paddy straw for dairy cow was negative and insignificant, indicating that 1 percent increases of this input, keeping other factors constant, would result in decrease of milk yield by .065percent. The major cause of being negative of this co-efficient is due to easy availability and excessive use of this input.

Bran and pulses cost (X_3)
The regression coefficient of bran for dairy cow was positively significant at 5% level. This indicates that an increase in 1 percent of this input, keeping the other factors constant, would result in significant increase of milk yield by 0.004 percent.

Veterinary cost (X_4)
The regression co-efficient of the veterinary input for dairy cow was positively significant at 1% level. This indicates that an increase in 1 percent of this input , keeping the other factors constant, would result in significant increase of milk yield by 0.271 percent.

Utilities (X_5)
The regression coefficient of utilities for dairy cow was positively significant at 5% level. This indicates that an increase in 1 percent of this input, keeping the other factors constant, would result in significant increase of milk yield by 0.023 percent.

Value of R^2
The coefficient of multiple determinations, R^2 was 0.694 for dairy cow which indicated that about 69.4 percent of the variation in milk yields was explained by the independent variables included in the model.

F-values
The F-value = 14.07 of the equation was highly significant at 1 percent level implying that all the variation in milk yield depends mainly upon the explanatory variables included in the model.

6.4 Resource use efficiency
In order to accomplish the objective of profit maximization i.e., for efficient allocation of resources, one should use more of the resources as long as the value of added product is greater than the cost of added amount of input producing it. The resources are considered to be efficiently used when the ratio of marginal value product (MVP) to marginal factor cost (MFC) approaches one, in other word, MVP and MFC for each input are equal to one. The standard way to examine such efficiency is comparing MVP with MFC. The optimum use of particular input would be ascertained by condition of equality of MVP and MFC, i.e.

$$MVPxi \div MFCxi = 1$$

The MVP of particular resource represents the addition to milk yield in value terms resulting from an addition of one unit of that resource while other inputs are held constant. The most reliable, perhaps the most useful estimate of MVP is obtained by

taking resources (X_i) as gross return (Y_i) at their geometric means. Since the five variables of the regression model were measured in monetary value, the slope coefficients of those explanatory variables in the function represented the MVPs, which were calculated by multiplying the production coefficient of given resources with the ratio of geometric mean (GM) of milk yield in value terms to the geometric mean(GM) of the given resources , i.e. ,

$\ln Y = a + b_i \ln X_i$

$dY/dX_i = bi\ Y/X_i$

Therefore,

$$MVP = b_i \frac{\overline{Y_i}}{\overline{X_i}}$$

Where,

    $\underline{b_i}$= Regression coefficient of respected inputs

    $\overline{X_i}$ = Mean value (Geometric mean) of X_i variable inputs cost

    $\overline{Y_i}$= Mean value (Geometric mean) of gross return of milk production

    I = 1,2,3,4,5……..

    dY/dX_i = Slope of the production as well as MVP of ith input.

In order to capture the status of resource use efficiency, it was considered that a ratio equal to unity implies the optimum use of the factor,a ratio more than unity indicates that the return could be increased by using more of that resource and a value of less than unity implies the unprofitable level of resource use which should be decreased to minimize losses. The estimated ratio between MVP and MFC of different inputs are presented in table 6.1.

Table 6.1 shows that the ratios of MVP and MFC of bran and pulses cost (X_3), cost of medicine (X_4) and cost of utilities (X_5) were greater than unity of dairy farming, indicating that more return may be obtained by increasing the use of these resources.

The ratio of MVP and MFC of human labor(X_1) was positive and greater than unity of dairy farming, indicating that more profit may be obtained by increasing the use of these resources. But the ratio of paddy straw and green grass (X_2) was negative and less than unity which indicates the excessive use of this input perhaps due to easy availability of home supplied paddy straw.

Thus, it appears from the table that the ratios of MVP and MFC of all the inputs were not equal to one and positive. These inequalities indicate that the farmers in the study area have failed to show their efficiency in using all resources. As concluding observation it may be suggested that dairy farms in the study area have scope to attain full efficiency by reallocating the resources.

CHAPTER 7

PROBLEMS OF DAIRY VALUE CHAIN ACTORS AND SUGGESTED MEASURES

7.1 Introduction

For upgrading value chain or value chain development in Dhaka District, there are some problems faced by dairy value chain actors. These problems are mainly two types; production related problem and marketing related problem. Production related problem means problems occur due to milk production which causes lower production rate as well as lower profit. This chapter discusses the various constraints faced by these value chain actors and their suggested remedial measures to these constraints.

7.2 Production related problem faced by farmers

These problems arelack of credit, high labor cost, disease problem and inadequate veterinary care, electricity problem, expensive and inadequate feed supply, lack of grazing land and green grass, lack of adequate extension services and technical knowledge, shortage of capital, low quality feed etc. According to research results, all these problems were rank into their severity basis.

7.2.1 Lack of institutional credit

Dairy farming is a capital intensive enterprise. Producers need cash capital for purchasing cow, feed and medicine and to expand their business. Credit is considered as a lubricant to capital. The price of crossbred cow is so highthat it is very tough to farmers to purchase a number of cows in cash taka. Most of the small-scale dairy farm holders (95%) reported that they needed credit or capital to run the farming activities smoothly. In the study areas very few dairy owners had the access to the formal credit institution for loan. Most of them did not get any loan from any commercial bank or financial institutions. Due to lack of adequate capital, the respondents could not be able to give adequate feed, necessary veterinary services and especial care to the animals which leading to lower milk production resulting in lower return from this industry.

7.2.2 High labor cost

The price of labor constitutes a significant part of the total cost of a small business, and no business can survive for long by ignoring labor costs. Downsizing the workforce may result in short-term cost reduction. However, this will leave one vulnerable when he needs to ramp up volumes with short notice. Unfavorable employee turnover also contributes to overall labor costs. Rational and intelligent labor cost control will boost productivity and enhance profits. In Dhaka district, labor cost is higher than other districts in Bangladesh. Though the less involvement of family labor, farmers need to employ more labor. 85 percent of total farmers reported labor cost as high.

7.2.3Disease problem and inadequate veterinary care

Diseases are very frequent in dairy cows. Sometimes it leads decease of these animals which create loss to dairy farmers. Veterinary doctors are a few in the study area. When the farmers call the doctors especially from distant place they come home but charge fee even they are supported to provide free veterinary care under contractual arrangement. The dairy farm owners claimed that when they felt the services of veterinary doctors was very much urgent they did not get their care and services from the local veterinary offices. In the case of emergency the farm owners failed to bring them at their houses. The farmers had to pay high charges to the veterinary doctors for every calling. About fifty two percent of the dairy owners reported this problem as an important one. Foot-and-mouth disease (FMD), Black quarter,parasitic diseases,Anorexia, and Bloat are very common diseases to cattle.Mastitis is a dangerous disease for lactating animals, and reduces milk production. In addition, the improved varieties of cows like Australian Sahiwal, Hariana, and Friesian need proper medical attention in the tropical environment.

7.2.4Electricity problem

Load shedding is very frequent in Dhaka district. Electricity is precisely essential for commercial dairy farms. To drive water pump, light, fan etc. electricity is extremely needed. Forty percent of farmers reported about recurrent load shedding.

7.2.5Expensive and inadequate feed supply

To increase productivity of milch cow concentrated feeds are most important. Concentrated feeds such as wheat bran, pulse bran, oil cake, molasses etc.were not available in the local markets. Otherwise supply of feed was always less than the existing demand of feed which raise the price of feed. They had to buy those from distant markets. Ninety percent of the respondents reported expensive and inadequate feed supply is one of the major problems. Unavailability of feed especially concentrate was identified as one of the severe constraints for the development of dairy industry. This unavailability makes the high price of feed. About ninety percent of the dairy owners reported this problem as a major one. High price of concentrate feed was the major cause for higher cost of milk production which leads to the price hike of milk.

7.2.6 Lack of grazing land and green grass

Lack of grazing land was another problem in the study area. In Dhaka district due to the introduction of modern technology, new infrastructural changes and increasing need of housing, the grazing land is decreasing day by day and therefore grazing land of dairy cows and green grass are becoming an acute problem. Most of the dairy farmers reported shortage of green grass which resulted in lower yield of milk and about seventy five percent farmers reported this problem.

7.2.7 Lack of adequate extension services and technical knowledge

The farmers were found to have deficiency in technical knowledge on disease identification, artificial insemination, vaccination applying medicine etc. The farm owners felt that dairy farming is a scientific and technical activity that needs training on this technical aspect. The farm owners required feed, improved dairy animal health, regular take care, as well as technical knowledge about dairy management which were lacking in some dairy farms. Sixty four percent farmers reported on this deficiency.

7.2.8 Shortage of capital

Shortage of capital is one of the obstacles for dairy enterprise. When a farmer starts dairy farming or wants to expand farm he needs large amount of cash capital because of high number of crossbred dairy cows. Moreover expensive concentrate feed,

medicine and high fees of veterinary doctors were the burden of them. Eighty percent of the farmers reported that lack of adequate capital was one of the major problems.

7.2.9Low quality feed

Fifty percent of the selected milk producers reported that shortage of quality feed was an acute problem for raising dairy cow.

Table 7.1 Problems faced by the farmers during milk production

Problems	Number of respondent	Percentage of respondent reporting problem	Rank
Lack of credit	28	92	2
High labor cost	26	85	3
Disease problem and inadequate veterinary care	16	52	7
Electricity problem	12	40	9
Expensive and inadequate feed supply	30	100	1
Lack of grazing land and green grass	23	75	5
Lack of adequate extension services and technical knowledge	19	64	6
Shortage of capital	24	80	4
Low quality feed	15	50	8

Source: Field Survey 2014

7.3 Marketing related problem faced by dairy farmers

The marketing effort has to be recognized not so much as a sales activity but as an essential pre requisite for ultimate milk production. As indicated earlier, the absenceof an efficient market is a problem for feed inputs as well as for the industry's outputof milk. The goal of any marketing program is to move the product from the producer to the consumers in an economicaland orderly manner, which satisfies the customers and provides a reasonable profit tothe producer and processor. Therefore, with a proper perspective, marketing as anapproach can provide a meaningful direction to the dairy development effort. The following marketing related problems are faced by dairy farmers:

7.3.1 Preservation problem

If milk is to be consumed as fresh liquidmilk, its perishable nature requires it to be processed generally within 24 hours ofbeing produced. During this time the milk must

be stored below 4 degrees Centigrade.30 percent of total farmers were facing this problem in the study area.

7.3.2 Lack of milk processing center

The extreme perishability and bulkiness of milk, available from widely scattered ruralsources, requires efficient methods of milk collection, processing and distribution tothe urban consumers. The marketing system thus links the milk producers in the ruralareas and consumers in the distant urban areas. Lack of installation of processing plants is another constraint to the efficient and profitable working of dairy enterprise. 80 percent farmers reported this problem as a major one.

7.3.3High packaging cost

Packaging is especially significant for growing startups because it can have direct impact on sales and farm's overall appeal. Packaging is powerful because it tells consumers why products are different. Packaging can continue to influence a farm's sales as it grows larger, too. Ten percent of total consumers reported on high packaging cost. 70 percent of total farmers were facing this problem in the study area.

7.3.4 Communication problem

Communication is another problem that increases marketing cost. Fifty percent farmers reported this problem.

Table 7.2 Marketing related problem for dairy farmers

Marketing related problem	Number of respondent	Percentage of respondent reporting problem	Rank
Preservation problem	9	30	4

Lack of milk processing center	24	80	1
High packaging cost	21	70	2
Communication problem	15	50	3

Source: Field survey, 2014.

7.4 Problems faced by the milk traders (Faria, Bepari)

7.4.1 Spoilage of milk

Milk trader had no storage facility whereas milk is a highly perishable product, so there was high risk of milk spoilage. This problem was reported by 50 percent of milk traders. Weight loss and damage were a major problem of the intermediaries. It increased cost and reduced profit.

7.4.2 Shortage of capital

About 70% intermediaries reported that inadequate capital arose as a problem to run their business smoothly. For lack of capital they could not increase their volume of milk transaction.

7.4.3 Entry of new milk traders

Fifty percent of milk traders reported that the competition in milk marketing had increased and established milk traders was facing problems in selling of milk due to entry of a considerable number of new traders. Moreover, milk traders faced the problem of strike, hindrance in milk supplying forhartal and political instability.

7.4.4 Scattered milk production

The local milk traders did not collect milk from the area where the milk collection points of large companies/organizations are situated. The traders had to run from door to door of milk producers for collection of milk. So scattered milk production was reported as a problem by 100 percent of traders. The extreme perishability and bulkiness of milk, available from widely scattered ruralsources, requires efficient methods of milk collection, processing and distribution tothe urban consumers. The marketing system thus links the milk producers in the ruralareas and consumers in the distant urban areas.

7.4.5 Deferred payment

Milk traders sold larger share of their daily sale of milk to the sweetmeat processors but sometimes they failed to pay their payment in time for unidentified reasons.

Although it did not take more than 7 days but this short time created problems for the milk traders because they purchased milk on the basis of cash on delivery. 40 percent of total traders reported this problem.

7.4.6 No written record

The selected milk traders did not keep any record of their supplied milk to the consumers over the month. Consequently, most often it became a problem to calculate the volume of milk selling and payment record. This was a problem noted by 40 percent of selected milk traders.

Table 7.3Problems faced by milk traders.

Problems	Number of respondent	Percentage	Rank
Spoilage of milk	5	50	3
Shortage of capital	7	70	2
Entry of new milk traders	5	50	3
Scattered milk production	10	100	1
Deferred payment	4	40	4
No written record	4	40	4

Source: Field Survey 2014

7.5 Problems faced by the sweetmeat shoppers

Sweetmeat shopper collects milk product from their own sweetmeat production plant in Dhaka district. So the constraint of sweetmeat shopper and sweetmeat maker is same.

7.5.1Sweet is not in good shape

The nice shape of sweet is one of the top choices of consumers which make the sweet more attractive. Some sweets of sweetmeat shoppers become useless due to this problem and 50 percent shopper reported this problem.

7.5.2 Breakdown of raw sweet

Breakdown of raw sweet is common in Bangladesh. In the study area this problem was reported by all sweetmeat shoppers.

7.5.3 Quick hardiness of sweet

Hardness of sweet reduces the quality of sweet which leads sweet to be unsold. It creates loss to the sweet meat shopper. 40 percent of sellerscomplaint against this problem.

7.5.4Lack of milk processing technology

Milk processing technology for sweetmeat production is not so updated to the era. For this reason processor cannot meet the public demand accurately. 60 percent of the shoppers complaint against deficiency of modernized milk processing technology.

7.5.5High cost of collection of milk and delivery of milk product

High cost of collection of milk and delivery of milk product due to long distance was one of the problems faced by the farmers. All farmers reported this problem.

7.5.6High concentration of the different organization in the same area

Many different milk based organizations collect huge amount of milk at the same time which creates problems to sweetmeat makers.

7.5.7 Scattered milk production

High cost of collection due to scattered and low volumes of milk production was a major problem to them.

7.5.8 Lack of information

It was very difficult task to find out the actual milk production in different areas due to lack of information. So it was tough to take appropriate decision for sweetmeat making.

7.5.9 Other problems

Other problems such as traffic jam,road accident and fickleness of road were the concerns forthem.

Table 7.4 Problems faced by the sweetmeat shoppers

Problems	Number of respondent	Percentage	Rank
Sweet is not good shape	5	50	3
Breakdown of raw sweet	10	100	1

Become hardy	4	40	4
Lack of milk processing technology	6	60	2
High cost of collection of milk and delivery of milk product due to long distance	10	100	1
High concentration of the different organization in the same area	10	100	1
High cost of collection due to scattered and low volumes of milk production	10	100	1
Lack of information about actual milk production in the study area	10	100	1

Source: Field Survey 2014

7.6 Constraints faced by the extension service providers

I. Existing human resources in extension are inadequate to provide services.

II. Distant areas are needed to cover because of shortage of service provider.

III. Farmers often are not able or willing to pay for necessary service.

IV. Ineffective cold chain for vaccines.

V. Unavailability of necessary medicines.

7.7 Constraints faced by animal drug sellers

I. Volume of sale was lower relative to their expectation.

II. Lack of knowledge of milk producers about animal drug.

III. Unavailability of animal healthcare drug due to reduction in production of vaccines in recent years and duties on imported vaccines.

7.8 Constraints faced by the extension service providers

I. Lack of information about milk producers and their needs.

II. Unavailability of raw materials for feed.

7.9 Probable measures suggested by dairy value chain actors

The respondents of study areas were asked to suggest solutions to the problems. They suggested different measures for solving their problems. The suggested measures of different respondents presented below:

a. Probable measures suggested by dairy farmers

1. **Ensuring easy access to institutional credit (through bank and NGOs)**

Farmers need credit facility or easypayment scheme. Because the livestock development has accelerated the demand for concentrate feeds, drugs, vaccines, and veterinary services. These trends are expected to continue in the coming years with resultant increases in demand for credit support. Expansion of livestock operations among poor smallholders and commercial livestock producers, as well as input suppliers (feed mills, drug producers, etc.) and processors of livestock products is thus expected to increase the demand for finance throughout the sub-sector, and will be needed to help facilitate continued horizontal and vertical integration. So, government, banks and NGOs should provide micro credit at lower interest rate.

2. **Improve owner-labor relationship**

An improved owner-labor relationship is needed to grow cost-saving ideas from employees and make them a part of the decision-making process. The labor costreduction can actually help improve employer-employee relations.

3. Improving veterinary service

The control and eradication of disease on the local and national levels creates the opportunity for the development of cooperation between farmers. Vaccination programs especially for small holders are best carried out at central points. This creates many opportunities for spreading the message of animal health and nutrition. At such gathering points the farmers' animals should be segregated until they have been examined; concomitant disease should be pointed out to individual farmers and advice or treatment given. The veterinary surgeon should be alert to signs, which may limit the animals' future value. The purposes of the vaccination program should be carefully explained. Plans for future programs should be given. Mobile services for animal health services and increment of the number of doctors, low price medicine should be provided.

3. **Supply high quality feed at subsidized price**

Government should take immediate initiatives through the department of livestock services and BLRI in solving the problem of inadequate supply and low quality feeds at a subsidized price. The national NGOs could come forward by establishing feed mills and or to help private entrepreneurs to set up feed mills through financial and technical assistance.

5. Allocation of *Khas* lands for producing fodder/grass

The department of livestock services (DLS) could take initiative to introduce the cultivation of HYV green grass. Fellow lands may be used as the demonstrating plot for the motivation of the potential farmers for fodder production. Cultivation of green grass would be a profitable investment because there is always a high demand for the fodder throughout the year.

6.Steady supply of electricity

It should be ensured for preserving milk. The business communities are most suffered of this frequent load shedding. However, this problem will persist up to establishing new production plant of electricity to accelerate increasing trend.

7.Ensuring technical knowledge and extension service

Information is the lifeblood of every economy. Without reliable information, markets do not work well. A sound national knowledge strategy requires that governments seek ways to improve information flows that make a market economy function better. Government can greatly improve market outcomes by providing and eliciting information that would not otherwise be available. Absence of meaningful extension support in the livestock sector has undermined the potential of the smallholder production systems and has rendered investment in the sector for production enhancement and technology transfer, at least in part, unprofitable.

8.Establishment of milk processing center

The installation of a processing plant is the first sign of modernization of the dairy industry, because a processing plant can play a positive role in a number of ways.

b. Probable measures suggested milk traders (Faria, Bepari)

1. Timely payment by the clients of milk traders would facilitate the marketing activities of milk traders.

2. Maximum milk traders did not keep any written records of their daily sales of milk, which created problem at the time of payment after a month. Since most of the traders were illiterate so they are unable to keep written records regarding their daily sell. A misunderstanding always occurs on the number of days of milk supply over a month between traders and buyer. So, traders should be educated by government.

3. Strike, hartal, political instability has become a social problem in Bangladesh and the main sufferers of these are that low income group who are to earn their living by daily business. However people recently have started abhorring strike, hartal as a tool of political movement and it is hoped that in future these practice will be disappeared from the society.

4. National and local NGO's can introduce micro credit program for milk traders so that they can expand and run their business.

5. Due to perishability preservation is necessary for marketing of milk because it creates time utility for the product. Private initiative may also be encouraged in this regard by providing bank loans and allowing import of necessary equipment/tools.

c. Probable measures suggested by sweetmeat shopper

1. Improved milk processing technology accelerates production capacity of sweetmeat. So, technology should be improved.

2. Milk collection plat should be established to reduce uncertainty about milk collection and delivery.

d. Probable measures suggested by feed/ fodder supplier

Increase the interest of farmers to produce fodder or raw materials of dairy feed, so that the problems of raw material would be minimized.

e. Probable measures suggested by animal drug sellers

1. Reduced import duties of vaccine.

2. Increased consciousness of dairy milk farmers about their animal health care.

f. Probable measures suggested for extension service providers

1. Increase the number of AI service providers through recruit AI providers in government and Non-government organization.

2. Farmers have to know about the benefit of the introduction of newer production technologies (like AI service).

CHAPTER 8

SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.1 Summary

This research was carried out on Value Chan Analysis of Dairy Milk Production and Marketing in Dhaka District. The study was undertaken to provide empirical evidence on marketing systems with a focus on milk production and marketing so that future effortto improve the link from milk producer to sweet meat shop and consumer may get benefit from them. The specific objectives of the study were as follows:

1. To determine the socio-demographic characteristics of dairy farmers and other value chain actors;

2. To identify existing and efficient milk value chain in marketing channels;

3. To measure production, relative profitability and value addition in every stage of channels;

4. To estimate productivity, resource use efficiency in milk production by farmers, and

5. To identify problem and recommend policy reform options to improve dairy marketing system.

Dhaka district was selected for the study. Mohammadpurthana and Dhamraithana were chosen based on concentration of milk producers. Only those mohallas/ paras and milk market were selected where milk producers and other value chain actors (milktraders, service providers) were available.

Three types of questionnaire were developed carefully for three types of value chain in the study area, namely dairy farmers, milk traders and service providers. The total number of respondents was 50, which consisted of 30 dairy farmers, 10 milk traders (Faria, Bepari) and10 for service providers (sweet meat shopper) . The value chain actors included feed/fodder suppliers, transporter, extension service provider, credit service providers. Sample units were selected through simple random sampling technique.

Primary data were collected through field survey method during the months of July-December 2014 by researcher herself, secondary data were also collected by researcher herself from available sources. Cobb-Douglas production function method

was used to analyze productivity of dairy farms, while Acharya's method was used to estimate marketing efficiency. Average and percentage were used to present the results. The main actors involved in dairy value chain were as follows:

I. **Operational service providers**
   - Milk producers
   - Faria
   - Bepari
   - Sweetmeat shopper
   - Farm laborer
   - Consumer

II. **Support service provider**
   - Extension service provider
   - Transporters
   - Feed/Fodder supplies
   - Veterinarian
   - Credit organization

Cost and return were calculated to find out the profitability of milk producers. A number of variable and fixed costs were reported to have been incurred in milk production. The variable costs items included the cost of feed, labor, veterinary services, electricity and miscellaneous cost. Fixed cost covered costs of water pump, cost of housing and capital cost. The total costs per day per cow were estimated at Tk. 378.89. Variable costs and fixed cost accounted for the major part of the total costs. Average variable cost and average fixed cost were Tk. 338.43 andTk. 40.46respectively. The shares of variable cost and fixed cost to the total cost per day per dairy cow were 89.32 percent and 10.68 percent,respectively,for an average farm.

The gross returns from per day per dairy cow were estimated at Tk. 693.5 where return from milk shared maximum of the total percentage. The gross return from cow dung and calf per day per dairy farm were Tk. 2.5 and Tk. 52 respectively. The cow dung and calfshared 0.36 percent and 7.5 percent, respectively, of the total gross farm income.The average gross margin per day per dairy cowwas estimated at Tk. 355.07for a farm. Net returns were calculated at Tk.308.55for a cow and Tk. 30.86 per liter of milk.

Marketing cost items of the local packaged milk were packaging cost (labor, polythene, branding and electricity), transportation cost and costs of milk container. The highest cost component was packaging cost which accounted for Tk. 2.00 per liter of milk and this represents 33 percent of total marketing cost of dairy farmers.The total marketing cost of milk producers was Tk. 6.06 per liter of milk. The value addition by milk producers was estimated at Tk. 28.06 per liter of milk. Return on cost was 72.57 percent. BCR or benefit cost ratio of rearing a dairy cow was 1.8 indicating that investment in dairy farming would be profitable.

Marketing cost of milk traders (Faria)were transportation cost, labor cost, cost of milk container, market toll, personal expenses and other costs. The total marketing cost was Tk. 2.38per liter of milk and Tk. 237.5 per 100 liter of milk, respectively. The grossmargin for per liter of milk and per 100 liter of milk wasTk. 4.00 and Tk.400, respectively. So the value addition by Faria for per liter of milk and for per 100 liter of milk were estimated at Tk. 1.63 and Tk.162.5, respectively. Return on cost for per liter of milk for Faria was estimated 2.5 percent.

Marketing cost of milk traders (Bepari) included transportation cost, labor cost, cost of container, milk container, personal expenses and other costs. The total marketing cost was Tk. 2.47 per liter of milk and Tk. 247 per 100 liter of milk respectively. The gross margin for per liter of milk and per 100 liter of milk was. 5.00 andTk. 500, respectively. So the value addition by Bepari for per liter of milk and for per 100 liter of milk were estimated at Tk. 2.53 and Tk.253, respectively. Return on cost for per liter of milk for Bepari was estimated 4.40percent.

Production and marketing cost items of sweet meat shoppers were milk cost, sugar cost, flour cost, rent cost, fuel cost, transportation cost, packaging cost, electricity cost, labor cost, fixed cost, other costs etc. Milk cost on average, incurred by sweetmeat shops was reported to be Tk. 6000 per 100 liter of milk. This cost component represents 62.83 percent of total cost. It was the highest cost component. Sugar cost was reported as Tk.933 per 100 liter of processed milk which was 9.77 percent of total cost. Flour cost was reported as Tk. 26 per 100 liter of processed milk which was 0.27 percent of total cost. Cost of fuel, labor and rent were calculated as Tk. 145, Tk. 150, Tk. 125 per 100 liter of processed milk which was 1.51 percent, 1.57 percent, 1.31 percent of total cost, respectively.

The gross return of roshagolla, kachagolla, shandesh, danadar andsweet curd was accounted for Tk. 3220, Tk. 2800, Tk. 3150, Tk. 1980, Tk. 2600, respectively and 23.42 percent, 20.36 percent, 22.91 percent, 14.4 percent, 18.91 percent of total cost, respectively. The total gross return from 100 liter of milk was 13750 taka. Total marketing and production cost of sweetmeat shops was Tk. 9548.33. The value addition of sweetmeat shops was estimated at Tk.4201.67 for 100 liter milk and 42.01 for per liter milk.

Consumer paid lower price in value chain-II compared to value chain-III and value chain-I. Considering three value chain on the basis of product flow it was found that value chain-II is more efficient than value chain-I and value chain-III .

So we can say that value addition by sweetmeat shopper was the highest among the value chain actors. We can also say that in case of local packaged milk producers earn the highest return on cost.

A Cobb-Douglasproduction function was specified and analyzed to detect productivity, resource use efficiency and impact of different resources upon the milk yield. Five important independent variables were included in the model. These variables werelabor, paddy straw and green grass, bran and pulses, medicines, utilities. It was found that the estimated value of labor,bran and pulses, medicines, utilities have positive significant effect on milk yield. But paddy straw and green grasses werenegatively related to the yield. It was found that in general, dairy cow owners were not using their inputs efficiently.

The standard way to examine the effeceency of resource allocation is to compare marginal value product (MVPs) with the marginal factor cost (MFCs) of each variable input. It was observed that the ratio of MVP and MFC of labor, bran and pulses, medicines and utilities cost for milk return were positive and more than one which indicated that more return could be obtained by use of these inputs. But the ratio of paddy straw and green grasswas negative and less than unity which indicates the excessive use of this input.

The problems faced by dairy farmers werelack of credit, high labor cost, disease problem and inadequate veterinary care, electricity problem, expensive and inadequate feed supply, lack of grazing land and green grass, lack of adequate extension services and technical knowledge, shortage of capital, low quality feed, preservation problem, lack of milk processing center, high packaging cost etc. Ensuring easy access of institutional credit (through bank and NGOs)improve owner-

labor relationship, improve veterinary service, supply high quality feed at subsidized price, allocation of Khas lands for producing fodder/grass, steady supply of electricity, ensuring technical knowledge and extension service, establishment of milk processing center were the farmer's recommended measures.

The problems faced by milk traders were spoilage of milk,shortage of capital, entry of new milk traders, scattered milk production, deferred paymentand no written record .The suggested measures to solve those problems were micro credit, timely payment by clients and mass education.

The problems faced by sweet meat shoppers were bad shape of sweet, breakdown of raw sweet, become hardy texture, lack of milk processing technology, high cost of collection of milk and delivery of milk product due to long distance, high concentration of the different milk collecting organizations in the same area, high cost of collection due to scattered and low volumes of milk production and lack of information about actual milk production in the study area. The suggested measures to solve problems include adoption of improved milk processing technology and establishment of milk collection plants in the study areas.

8.2 Conclusion

Based on the results of the study it may be concluded that dairy industry is profitable enterprise, though this enterprise faces many constraints for its rapid development and growth. The demand for milk in the urban areas is very high and dairy owners cannot fulfill the demand for milk with their limited milk production. The study also revealed that, value addition of sweetmeat shopper is the highest than that of other value chain actors. There is an ample scope to increase the production of milk from the existing level if the dairy farm owners are provided necessary facilities like adequate feed supply at reasonable prices, necessary drugs, adequate veterinary services, technical training, and access to credit at an easy terms and condition. If proper steps could be taken, dairy farming could be a more viable commercial enterprise which in turn could play a dynamic role to overcome the problems of low income, unemployment, under nutrition and unfavorable balance of payment situation of the country. Government should give emphasis on this sector to improve the present situation of milk production and marketing as well as help value chain development of milk. To overcome the difficulties of raising dairy farms and to make milk production and marketing more profitable in the country, a set of recommendations are put forward.

8.3 Recommendations

The following specific recommendations, based on the findings of the study, can be derived in order to lubricate existing value chain system of milk.

❖ In order to improve small-scale householders life style by the way of improving dairy production in the study area, there is a need for technical and institutional intervention to alleviate the identified constraints through dissemination of appropriate technologies for better disease prevention , establishing reliable milk market, availability of drugs with convenient price, feeding, artificial insemination service, improved dairy animals supply, which will significantly increase milk production and animal performance.

❖ Subsidies for imported dairy products should be withdrawn for encouraging the

private investors to make further investment in this sector.

❖ Credit facilities should be provided from both private and government institutions on easy terms and conditions for milk producers and traders.

❖ The DLS and NGOs should strengthen their program to train the dairy farmers on dairy management, animal health care, sanitation, and marketing technique of milk on priority basis.

❖ The government should provide necessary assistance for establishment of feed mill in the private sector for making quality feed available in the market.

❖ The government should make arrangement for leasing khas lands to dairy farmers for fodder production, wherever possible

❖ The Directorate of Livestock Services (DLS) should take steps to issue veterinary card to the registered dairy farmers to ensure timely supply of veterinary services and medicines at reasonable cost.

❖ Mini commercial dairy farms may be encouraged by lowering the rate of interest on loan. For disbursing credit properly and adequately the government may establish "Livestock Bank".

❖ The government should emphasize on education and manpower training in dairy activities.

❖ Milk marketing facilities should be improved either by establishing milk processing plant in the area or by making provision for collection of milk through well-organized marketing bodies.

❖ With the intention of improving preservation facilities, provision should be made for supply of insulated containers to the farm owner and milk traders at a reasonable price.

❖ Establishment of bio-gas plant in every farm will increase the net profit of farmers which is completely environment friendly.

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APPENDIX

SURVEY SCHEDULE FOR SMPLE FARMERS, DEPARTMENT OF AGRIBUSINESS & MARKETING, SHER-E-BANGLA AGRICULTURAL UNIVERSITY

| নমুনা নং- |

| দুগ্ধ উৎপাদনকারী |

গরুর দুগ্ধের উৎপাদন ও বিপণনের মূল্য শৃঙ্খল বিশ্লেষণঃ থামার পর্যায়ের একটি অধ্যয়ন

উত্তরদাতার ব্যক্তিগত তথ্যাবলি

তথ্যদানকারীর নাম ◌ঃ --------------------------------------মোবাইল নাম্বার ◌ঃ --------------------
----

গ্রাম/ পাড়া ◌ঃ ------------------------------- ইউনিয়ন ◌ঃ ----------------------------

উপাজেলা ◌ঃ--------------------------------জেলা ◌ঃ --------------------------------

১. আর্থ সামাজিক তথ্য ◌ঃ

১.১ লিঙ্গ	১.২	১.৩ শিক্ষাগতযোগ্যতা	পেশা		১.৬ সদস্যদেরসংখ্যা	১.৭ কর্মক্ষমলোকেরসংখ্যা	১.৮ শিক্ষিত সদস্যদেরসংখ্যা
			১.৪ প্রধান পেশা	১.৫ পেশা			

১.১২ আপনার পরিবারের মোট আয়ের শতকরা কত অংশ দুগ্ধ থামার হতেআসে _____ %

কোড সমূহ

লিঙ্গ	পুরুষ=১, মহিলা-২
শিক্ষাগত যোগ্যতা	১ম-৫ম শ্রেণী = ১, ৬ষ্ঠ-১০ম শ্রেনী = ২, ১১শ-১২শ = ৩, স্নাতকএবংতারউপর = ৪, অশিক্ষিত = ৫
পেশা	কৃষক =১,কর্মচারী =২, কৃষি ও দিনমজুর =৩, দিনমজুর =৪,দুগ্ধব্যবসায়ী =৫, দোকানদার =৬,অন্যান্য ব্যবসা =৭, চাকুরী =৮, হস্তশিল্প =৯, রিঙ্া/ভ্যানচালক= ১০, অবসরপ্রাপ্ত =১১, ছাত্র = ১২, বেকার=১৩, অন্যান্য = ১৪

২.থামার উৎপাদন মুলধন

২.১উৎস	২.২পরিমান

৩.থামারেরদুগ্ধউৎপাদন ২

৩.১ বাচ্ছা প্রকার	৩.২ সংখ্যা	৩.৩	৩.৪ উৎপাদনের	৩.৫ ক্রয় মুল্য ( )	৩.৬) দৈনিকঃ উৎপাদনের (ঃ)	৩.৭) দৈনিক উৎপাদনের (ঃ)	৩.৮ বর্তমান ি ক্রয় মুল্য ( )

৪.অন্যান্য বাসস্থান

	সংখ্যা	স্থাপন		ব্যাবহার মেয়াদ ( )
বিদ্যুৎ খরচ (টাকা/মাস)				
লাইট ক্রয়				
ফ্যান ক্রয়				
থানার পাত্র				
টিউবওয়েল স্থাপন				
পানির মেশিন স্থাপন / ক্রয় / ভাড়া				

৫.:দুগ্ধবতী সংখ্যা _____
প্রতিপালনে দৈনিক দ্যঃ ( )

	ক্রয়		মুল্য
	কেজি /	/প্রতি বস্তা	(/ বস্তা)
খড়			
সবুজ ঘাস			
চাউলের কুঁড়া			
চিটা গুড়			
খৈল (সরিষা, বাদাম, সয়াবিন, তিল)			
গমের ভূষি			
খেসারি ভাঙ্গা/ডালের গুঁড়া			

থনিজ মিশ্রণ			
আয়োডিন লবন			
ইউরিয়া মোলাসেস স্ট্র			
ইউরিয়া মোলাসেস ব্লক (বি.এম.ইউ)			

৬. অন্যান্যউপকরন

	নিজস্ব		ক্রয়		মূল্য
	সংখ্যা	ঘন্ট /	সংখ্যা	ঘন্ট /	
শ্রমিক :					
পারিবারিক শ্রমিক					
দৈনিক শ্রমিক					
মাসিক বেতনে শ্রমিক					
চিকিৎসা:					
ঔষধপত্র (সংখ্যা, মূল্য)					
ডাক্তার (দিন সংখ্যা, মূল্য)					
কন্টেইনার (সংখ্যা, মূল্য)					
পরিবহন মাধ্যম					
১.					
২.					
৩.					
৪.					

৭.১৭. কন্টেইনার এর ধারন ক্ষমত _____ লিটার

৭. দৈনিক বিক্রির তথ্যসমূহ

	দৈনিকদ	প্রতিবেশী		গোয়ালা				মিষ্টির দোকান		নষ্ট	অন্যান্য	
গ্রাপ্তিকাল	(:)	(:)	মূল্য (/ :)	(:)	মূল্য (/ :)	(:)	মূল্য (/ :)	(:)	মূল্য (/ :)	(:)	(:)	মূল্য (/ :)

৮.   থেক: তথ্য (   )

আয়ের উৎস	সংখ্যাবা পরিমাল	মূল্য ( )
গাভা বিক্রু		
বাছুর বিক্রু		
বকনা/বলদ বিক্রু		
গোবর বিক্রু		

৯.

	সংখ্যাবা	(/)
প্যাকাজিং খরচ		
ক. শ্রমিক		
খ. পলিথিন		
গ. বিদুৎ		
পরিবহন খরচ		
কন্টেইনার		
বাজারের টোল		
সংরক্ষ খরচ		
অন্যান্য খরচ ১.		

১০.গরুর দুধেরমূল্য ও মান বজায় মূল্যসংযো   প্রক্রিয়া চর্চা ৰ   ? হ্যাঁ/   ।
হ্যাঁ   প্রক্রিয়ায় ?

বাছাই করা =১	চিহ্নিত করা =২	সংরক্ষ করা =৩	প্যাকাজিং= ৪	পরিবহন= ৫
গুনাগুন =৬	প্রক্রিয়াকরণ = ৭	বিজ্ঞাপন = ৮	অন্যান্য = ৯	

১১.দুধ বিক্রিতে সমস্যাসমূহ:

বিক্রির সমস্যাসমূহ	সমস্যার মাএা প্রকট– , সহনযোগ্য– , –
দুধ পরিবহনে সমস্যা হয়	
দুধ বিক্রির জন্য সংগঠিত বাজার নাই	
দুধ সংরক্ষণের ব্যবস্থা নাই	
দুধ বিক্রির শ্রমিক সঙ্কট হয়	
গোয়ালা ও ফরিয়ার মাঝে কোন্দল হয়	

গোখাদ্যের বাজার দর বেশি	
দুগ্ধ প্রক্রিয়াজাতকরণ শিল্পের অভাব	

দুগ্ধ খামারের সমস্যাদি বলুন ◌ঃ

ক্রমিক ৪	সমস্যাসমূহ	সমস্যার মাএা প্রকট- , সহনযোগ্য- , -

১৩. উক্তপ্রতিবন্ধকতাবাসমস্যাসমূহউত্তরনেরউপায়বানতুন উদ্যোক্তা সৃষ্টিরসুযোগসমূহকিকি?

ক্রমিক ৪	
১.	
২.	
৩.	
৪.	
৫.	
৬.	

১৪. দুগ্ধ খামারের ভবিষ্যৎ উন্নয়নের জন্য কি কি করা উচিত বলে আপনি মনে করেন ?

ক্রমিক ৪	
১.	
২.	
৩.	
৪.	
৫.	
৬.	

১৫. প্রভাবক সমূহ যা মূল্যসংযোজনকে প্রভাবিত করে ঃ

ক্রমিক	প্রভাবক	হ্যাঁ ( )/ ( )	হ্যাঁ কোনটাই
১.	ঋতুবৈচিত্র্যতা		

ক্রমিক	প্রভাবক	হ্যাঁ ( )/ ( )	হ্যাঁ কোনটাই
২.	রোগবালাই		
৩.	পচন		
8.	ডশঙ্কা		
৫.	পরিবারেরআকার		
৬.	রাজনৈতিকপ্রভাব		
৭.	মুদ্রাস্ফীতি		
৮.	দরিদ্রতা		
৯.	টাকার যোগান		
১০.	উীমা		
১১.	বাজারমূল্য		
১২.	উচ্চ কাঁচামালমূল্য		
১৩.	মূলধন		
১৪.	ঋনেরসুবিধা		
১৫.	মজুরি		
১৬.	বাজারেরগঠন		
১৭.	ক্রেতারসংখ্যা		
১৮.	দুঙ্কের যোগান		
১৯.	দুঙ্কেরচাহিদা		
২০.	বাজারেরঅবস্থান		
২১.	ব্যবসায়ীরসংখ্যা		
২২.	বিভিন্নবাজারনীতি		

মন্তব্য ঃ

আন্তরিক   জন্য ধন্যবাদ

সাক্ষর ....