

# Vertical Integration in the Dairy Sector in Bangladesh – The Case of Bangladesh Milk Producers' Co-operative Union Ltd.

S.K. Raha\*  
R.K. Talukder\*

## 1. INTRODUCTION

Milch cow keeping has been practiced for centuries by millions of rural households in Bangladesh. Livestock have been an integral part of the farming system from time immemorial. During the British reign, dairy farming was conducted both commercially and at subsistence level. Commercial production of milk was done by a professional group called *Ghosh* who used to rear large herd of dairy cows and produce milk and milk products commercially. Most of these entrepreneurs either left this profession or left the country due to changes in various socioeconomic and political conditions in the country. Dairy farming seems to have emerged as a profitable enterprise over the recent past years. In the Fifth Five Year Plan, the government set objectives to develop appropriate technologies for livestock production, generate income, and alleviate poverty through livestock development. Involvement of private sector and NGOs in the production of cattle, milk processing, input supplies and marketing of livestock products was also another objective in the overall development of the livestock sector. (GOB 2000). A lot of private initiatives are in place to exploit the potentials of the livestock sector in the country. In this paper, a modest attempt is taken to examine the activities of the Bangladesh Milk Producers' Cooperative Union Ltd (BMPCUL) as a case study of vertical integration in the dairy sector of Bangladesh.

The paper is mainly based mainly on secondary data and information available in the relevant context. The paper is divided into five sections. A brief description of

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\* The authors are Professors, Department of Cooperation and Marketing, and Department of Agricultural Economics respectively, Bangladesh Agricultural University, Mymensingh

the dairy sector in Bangladesh is presented in section II. Genesis of the BMPCUL is discussed in section III. Role and performance of BMPCUL are analyzed in section IV. Conclusions and their implications are presented in section V.

## **2. DAIRY SECTOR IN BANGLADESH**

### **Features of the Dairy Sector**

The dairy sector in Bangladesh is characterized by small-scale, scattered and unorganized milch animal holders; low productivity; inappropriate animal feeding and health care; lack of assured year-round remunerative producer price for milk; inadequate basic infrastructure for procurement, transportation, processing and marketing of milk; and lack of professional management. Other important characteristics of the dairy sector are the predominance of mixed crop–livestock farming and the fact that most of the milch animals are fed on crop by-products and residues, which generally have lower nutritional values. Additionally, dairy development policies and programmes followed in the country including those relating to trade are not congenial to the promotion of sustainable and equitable dairy development.

### **Position of Private Entrepreneurs in the Dairy Sector**

The dairy sector in Bangladesh is mainly operated by the private entrepreneurs. Most of the milk is produced by the rural households and majority of the households have 1 or 2 dairy cows. Most of these dairy cows are used for both milk production and draught purposes. There are some milk pocket areas where dairy farming has been traditionally an important and major component of mixed farming system. These areas are particularly located in the districts of Pabna, Sirajganj, Manikganj, Munshiganj, Faridpur, Madaripur, Rangpur, Tangail and Kishoreganj. In these areas there are some farmers who keep dairy cows only for milk production.

The present milk production is estimated at 1.62 million tonnes of which approximately 90% comes from cows and the rest 10% from goat and buffaloes. Of the total amount consumed, only 3.4% is obtained from processing plants and the rest (96.6%) is obtained from indigenous sources (Saha and Haque 2001). There are quite a good number of organized milk processing firms currently operating in the country. A list of the major ones is presented in Table 1.

**Table 1: Volume of sales of processed liquid milk by different dairy enterprises**

Enterprise	Daily sales (000 litres)	Percent
BMPCUL	110	62.16
BRAC Dairy	38	21.48
Abdul Momen Ltd.	4	2.26
Shelaida Dairy	4	2.26
Bikrampur Dairy	3	1.69
Savar Dairy	3	1.69
Aftab Dairy	5	2.82
Safa Dairy	3	1.69
Tulip Dairy	7	3.95
Total	177	100.00

Source : Saha and Haque, 2001

However, at districts level there are a few commercial dairy farms which sell non-pasteurized packaged milk. In district towns these types of firms have created their own market for their produce (Amin, 2000). The market for processed milk has been gradually increasing in the country. This in turn is creating opportunities for profitable investment in the dairy sector. In addition to private sector farms, there are only a few dairy farms in the public sector. These are located at Savar, Rajshahi, Sylhet and Faridpur.

The current milk production does not meet the present requirement. To meet the wide gap, powdered milk is imported by spending foreign currency ranging between Tk. 2000 to Tk. 2500 million per annum (Saha, 2002). The private entrepreneurs are more interested in importing powdered milk than investing in the dairy sector. This is one of the reasons for slow growth of the dairy sector in the country.

### **3. GENESIS OF THE BANGLADESH MILK PRODUCERS' CO- OPERATIVE UNION LTD. (BMPCUL)**

In 1946, before the partition of India, an organization named 'National Nutrients Co. Ltd.' made a plan to set up a dairy plant with a capacity of 2000 litres of milk per day at Lahiri Mohanpur, Pabna. But the plan was not fully executed due to partition of India in 1947. In 1952 an entrepreneur, Mr. Mokhlesur Rahman of Calcutta exchanged his property with this dairy plant. Within a few years the plant came out with the name 'Eastern Milk Products Ltd' and adopted the brand name,

Milk Vita for its products such as milk, butter and Ghee. Through government patronization, cooperative system was introduced in the management and operation of the plant and the first Milk Producers' Cooperative Society was formed in 1965 with the apex organization 'Eastern Milk Producers' Cooperative Union Ltd'. In 1967 it was handed over to the Cooperative Marketing Society. Another dairy named Asto Dairy at Tejgaon was also handed over to the Cooperative Marketing Society.

In 1972, after independence, the Government of Bangladesh initiated two major surveys (Kastrup 1972; Nielsen 1973) for the rehabilitation of the two existing dairy plants, i.e. the Lahiri Mohanpur Dairy at Pabna and the Asto Dairy at Dhaka. Based on the recommendations of the surveys, the government started a new development project, the Cooperative Dairy Complex, based on the AMUL pattern of India (Latif 1973). New project areas were identified and the earlier two dairies, along with their assets and liabilities, were amalgamated into the project. The organisational name of the project, the Eastern Milk Producers' Cooperative Union Ltd., was maintained until 1977. Subsequently, it was changed to the Bangladesh Milk Producers' Cooperative Union Ltd.

**Table 2: Plants of the Bangladesh Milk Producers' Cooperative Union Ltd**

Location	Distance from Dhaka (Km)	Nature of plant	Capacity/day (Litre)	Date of installation
Mirpur	10	Milk & milk products processing	110,000	May 1976
Tangail	100	Milk Chilling	10,000	June 1975
Manikgonj	90	Milk Chilling	10,000	September 1975
Takerhat	190	Milk Pasteurization	25,000	December 1977
Baghabari	125	Milk products Processing	162,000	November 1977
Srinagar	30	Milk Processing	5,000	October 1993
Rangpur	300	Milk Chilling	10,000	December 1995
Bhangura	155	Milk Chilling	5,000	October 1999
Lahirimohanpur	155	Milk Chilling	10,000	November 2000
Bhairab	75	Milk Chilling	5,000	April 2001
Raipur	208	Milk Chilling	10,000	February 2002
Natore	265	Milk Chilling	5,000	January 2003
Islampur	211	Milk Chilling	5,000	May 2003
Gabtali	185	Milk Chilling	5,000	August 2003

Source: BMPCUL 2003

Five plants at Dhaka, Tangail, Baghabari ghat and Manikgonj were established with an investment of Tk. 129.67 million which included foreign currency of Tk. 61.07 million. Nine more chilling plants were also established with BMPCUL's own resource (Table 2).

### **BMPCUL – A Vertically Integrated Firm**

Vertical integration refers to the extent to which successive stages involved in the production of a particular product or service are performed by a single firm or by a selected number of firms with mutual understanding. Vertical integration is also used to describe the action of a firm in acquiring or constructing facilities, carrying out productive stages, which formerly either preceded or succeeded its original productive activities (Needham, 1973). So a firm is vertically integrated when it integrates both the input and output sector. Here, we would like to study the 'Bangladesh Milk Producers Cooperative Union Ltd' as an example of vertically integrated firm in the dairy sector in Bangladesh.

## **4. ROLE OF BMPCUL**

The organization has covered 568 village milk producers' cooperative societies with 65,000 farmer-members. It has created job opportunities of 4,000 people in the rural areas and 750 people in the processing plants. The farmers have an assured market and a reasonable price for a defined quality of milk. The farmers thus have been able to get rid of the exploitation by middlemen namely Ghosh who used to exploit farmers by offering lower price, and fraudulent weights and measures. Over the years the volume of milk production increased with the increase in unit price of milk (Table 3).

The BMPCUL processes a number of milk products namely, pasteurized liquid milk, flavoured milk, butter, Ghee, ice-creams and lollies, full cream milk powder, skimmed milk powder, sweet curd and *Rasa Malai*. All these products are sold using the brand name Milk Vita. Now Milk Vita is a symbol of quality and hygienic standard of products in the market. The volume of sales of some of the major products of different years is shown in Table 4. Considering 1991-92 as the base year, the volume of sales of Ghee increased by 1862 % in 2000-01 followed by ice-cream (953 %), milk (791 %) and butter (163 %). Table 4 presents some of the milk products processed by the BMPCUL.

**Table 3: Milk collection and price paid to the farmers**

Year	Milk (Production)		Average Fat (%)	Average	
	(Million litres)	Price Fixed base Index		Taka /litre	Fixed base Index
1990-91	6.22	100.00	4.4	10.77	100.00
1991-92	6.48	104.18	4.6	11.68	108.45
1992-93	10.24	164.63	5.0	11.57	107.43
1993-94	12.05	193.73	5.1	11.77	109.29
1994-95	17.45	280.55	4.4	13.49	125.26
1995-96	18.33	294.69	5.2	14.33	133.05
1996-97	19.46	312.86	5.0	15.67	145.49
1997-98	26.52	426.37	4.7	15.87	147.35
1998-99	29.47	473.79	4.4	15.85	147.17
1999-2000	33.99	546.46	4.7	16.10	149.49
2000-01	41.32	664.31	4.6	16.50	153.20
2001-02	53.81	865.11	4.5	16.16	150.05

Source : BMPCUL 2003

**Table 4: Sales of milk and various milk products of BMPCUL**

Year	(sales in '000' litter / Kg)							
	Milk		Butter		Ghee		Ice-cream	
	Sales (Litres) Index	Fixed base Index	Sales (Kg) Index	Fixed base Index	Sales (Kg) Index	Fixed base Index	Sales (Litres) Index	Fixed base Index
1991-92	4558.54	100.00	170.47	100.00	13.08	100.00	39.35	100.00
1992-93	6923.54	151.19	189.55	111.19	83.38	637.46	89.72	228.01
1993-94	10337.37	226.77	209.97	123.17	58.31	445.80	133.09	338.22
1994-95	14418.16	316.29	247.18	145.00	72.14	551.53	185.95	472.55
1995-96	17154.78	376.32	276.23	162.04	95.50	730.12	104.55	265.69
1996-97	17150.38	376.23	219.55	128.79	96.55	738.15	130.76	332.30
1997-98	21765.70	477.47	250.39	146.88	116.67	891.97	225.11	572.07
1998-99	25498.77	559.36	285.49	167.47	115.51	883.10	302.88	769.71
1999-00	24446.93	536.27	282.51	165.72	82.50	630.73	289.38	735.40
2000-01	33293.63	730.36	349.22	204.86	108.18	827.06	345.15	877.13
2001-02	36696.74	805.01	392.17	230.05	182.67	1396.56	382.52	972.09
2002-03	40627.78	891.25	455.02	266.92	256.65	1962.16	414.23	1052.68

Source: BMPCUL 2003

An attempt was made to account for the extent of value additions to selected milk products. Substantial value addition occurred in the process of manufacturing of various milk products. The measurement of value addition is a complex procedure. However, here the difference of sales price of milk product and the farm price for an equivalent amount of raw milk was considered as the gross value addition to the product concern. Table 5 shows gross value addition to selected milk products, calculated for the years 1991-92 to 2000-01. The table shows that the gross value addition to the selected products in nominal price increased substantially during the period. Gross value additions on account of pasteurized milk, butter and Ghee were estimated at Tk. 407.82 million, Tk. 50.63 million and Tk. 21.99 million respectively for the fiscal year 2000-01 (Table 5).

**Table 5: Gross value addition by types milk products**

Gross value addition by types of products (million Taka)			
Year	Pasteurized milk	Butter	Ghee
1991-92	49.98	27.90	1.64
1992-93	83.44	33.66	0.67
1993-94	126.22	31.29	6.81
1994-95	138.72	30.54	8.23
1995-96	183.57	36.34	13.08
1996-97	193.34	26.73	12.58
1997-98	247.70	42.77	16.56
1998-99	273.20	44.42	26.15
1999-2000	385.59	51.07	22.21
2000-01	407.82	50.63	21.99

Note: 1. Gross value additions were calculated using data collected from the BMPCUL.  
2. Value additions to butter and Ghee include value of skimmed milk powder

The sales revenue from the major products is shown in Table 6. The revenue from milk and butter consistently increased while the return from Ghee and ice cream slightly fluctuated over the years.

**Table 6: BMPCUL's sale proceeds from major products**

Year	(Tk in Million)			
	Milk	Butter	Ghee	Ice Cream
1991-92	90.49	38.72	2.69	4.05
1992-93	139.51	43.70	6.93	7.29
1993-94	209.72	42.15	11.08	10.16
1994-95	293.44	49.39	15.66	12.38
1995-96	349.03	55.18	22.22	7.84
1996-97	381.46	46.08	24.18	11.34
1997-98	504.93	63.72	20.11	19.83
1998-99	594.69	64.96	37.52	26.50
1999-2000	678.69	68.98	29.82	26.06
2000-01	825.80	74.60	32.70	33.30
2001-02	920.87	83.70	54.78	39.48
2002-03	1016.92	96.31	77.46	42.98

Source: BMPCUL 2003

The BMPCUL has developed marketing channels for the distribution of its products. It has its own sales center at plant gate in Dhaka. Rickshaw Van Cooperative Societies are engaged in distribution to distributors in the Dhaka city. Distributors and agencies are also appointed in different district markets for the distribution of its various products.

To have a better understanding of the system of procurement and processing of milk by the BMPCUL, it should be viewed as an agribusiness system. As we know, the system comprises three sectors namely input sector, production sector and processing/ manufacturing sector ( Beierlein and Woolverton, 1991). Our dairy farming is beset with problems in all the three sectors. In the **input sector**, the major problems are scarcity of feed, non- availability of cross- bred cows, inadequate treatment facilities, lack of credit, lack of extension services and technical know-how. In the **production sector** farming operation is handicapped due to poor functioning of the input sector. In the **processing/ manufacturing sector**, producers have limited access to market and improved processing facilities (see for example Raha, 2001; Miah and Mandal, 2002). The following steps have been taken by the BMPCUL for improving its performance:

**Feed:** The BMPCUL has high yielding fodder production program. Moreover, it supplies balanced concentrate cattle feed (crude form) on 'no profit no loss' basis to the farmer- members; but the amount is not sufficient to meet the full requirement of the members. The organization makes arrangement to lease Bathan land from the government. Bathan land is used as grazing ground and also for the production feed grains.



**Cross-bred cows:** The BMPCUL provides artificial insemination service with deep- frozen semen for upgrading local breed. In the Baghabari area a high yielding breed is available. The organization tries to expand this stock in other areas through distribution of semen.

**Treatment facilities:** The BMPCUL has arranged free preventive and curative services for all cattle heads of members of the Cooperative Society (Table 7). The service is provided on emergency basis and is available for 24 hours.

**Table 7: Breeding and treatment services provided by BMPCUL to its member-farmers**

Year	No. of Primary Societies	No. of members ('000')	No. of Treatment ('000')	No. of Vaccination ('000')	No. of Artificial Insemination ('000')
1991-92	258	30.50	31.26	16.04	14.89
1992-93	268	34.82	32.66	19.87	21.62
1993-94	298	36.30	48.56	26.01	23.25
1994-95	322	42.50	60.68	28.65	16.25
1995-96	314	45.61	71.16	38.50	15.48
1996-97	358	47.99	92.57	35.61	22.52
1997-98	358	48.33	101.77	42.84	23.58
1998-99	390	49.36	98.03	60.27	28.58
1999-2000	450	59.62	68.75	60.03	37.42
2000-2001	518	60.00	81.34	36.28	44.47
2001-2002	568	65.00	96.76	54.33	49.80

Source: BMPCUL 2003

**Credit facilities:** Considering the need of the group members, the BMPCUL introduced interest free credit program to support the poor milk producing farmers for purchasing dairy cattle in 1994. The amount of loan fund available is about Tk.10 million per annum. The repayment is made from the weekly milk bill of the farmers. The repayment rate is 100% without any additional cost of collection.

**Extension services and technical know-how:** The BMPCUL has its own training programme on better animal husbandry practices. It displays audio-visual shows on improved cattle rearing practices and cooperative management. It also makes arrangement for training / study tour for the farmer- members to acquaint them with the modern scientific management and rearing practices of dairy animals.

**Output marketing:** Milk-producing farmers have limited access to market. They are mainly small in size and their individual production is also low. Consequently, their access to market is limited. The BMPCUL has developed a process of milk collection from the group members. Transportation system from collection point to processing plant and to Dhaka is also arranged. So the milk-producing farmers now have an assured market and a reasonable price for their milk. These arrangements significantly contributed to stabilization of production of milk in the areas.

## 5. CONCLUSIONS AND POLICY IMPLICATIONS

The livestock sector in Bangladesh is characterized by the preponderance of smallholders typically possessing only one or two milch animals. Low productivity, lack of proper feeding and animal health care, inadequate infrastructure for supply of inputs, procurement, processing, storage, transport and marketing of milk are the basic features of the sector. Despite these problems, the dairy sector holds high promise as a dependable source of livelihood for the vast majority of the rural poor in Bangladesh. The structure of BMPCUL, allowing for small-scale dairy production and marketing, as evolved through long experiences of trial and error, holds high promise for smallholder dairy development in the country. The structure may be reorganized in the pattern of AMUL of India (Singh 1999) and can be replicated in all the milk producing areas of Bangladesh.

Management is been the key factor in the success of smallholder dairying. This has been evident through the experience of BMPCUL (Bangladesh) and many other successful dairy development projects in other countries. The future of smallholder dairying will also rely on the continued adaptation of management techniques to suite markets, environments and socio-economic conditions of the country.

Liberalization of world trade in dairy products under the new trade regime of the WTO poses new challenges for the dairy industry in Bangladesh, as in other South Asian countries. We need to enhance our competitive economic advantage in dairy products. The role of government should be to direct, co-ordinate and regulate the activities of various organizations engaged in dairy development, to establish and maintain a level playing field for all stakeholders and to create and maintain a congenial socio-economic, institutional and political environment for smallholder dairy development. There is an urgent need to formulate and announce a comprehensive dairy development policy for the country. Such policy should be an integral part of the national development policy, and due consideration should be given to its direct and indirect effects on other sub sectors of the economy.

The agro-climatic and socio-physical features of Bangladesh seems to be conducive to small scale dairying, as a means of increasing income and employment, particularly for the rural disadvantaged classes of people. Public support is needed to protect the producers from adverse market conditions. Adequate public support is also needed to provide infrastructures to facilitate integration of production with processing and distribution, for attaining the two prong objective of increased production and consumption of milk in the country.

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