

**Dairy production, consumption and marketing in
Bangladesh**

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Abstract

This study was a part of RED-Imperial College joint research, conducted in July 2003. The broad objective of this study is to review the existing milk production, consumption and marketing situation in Bangladesh and to develop policy issues on improvement of milk marketing. It is revealed that milk production in the country has been increasing but not sufficiently to meet the large demand. 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 both NGO and private 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 neighbourhood 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.

The urban market for processed and packaged milk products, though still very small, is expanding rapidly. Collection and distribution networks, together with chilling centres and refrigerated transport infrastructure are developing under private sector and NGO control. These provide hygienic, high quality products, whilst also providing a range of employment opportunities throughout the sector. If development could proceed so that further employment was generated whilst expanding availability to a wider range of consumers this could be a positive development.

I. Introduction and Methodology of the study

This case study describes the overall situation of milk production, consumption and marketing in Bangladesh. Special emphasis has been given to the processing and marketing of fresh milk which is an emerging area in urban agribusiness. As part of the BRAC/Imperial College joint research project looking into 'Patterns and Trends in Food Consumption in Poor Urban and Rural Households in Bangladesh' a review of consumption patterns and trends of different food items has been undertaken. During the review discussions have been held with nutrition and marketing experts regarding the marketing potential of different processed food items which have demonstrated a growing market in urban as well as in semi-urban and in rural areas. Although marketing of processed milk in urban areas is not new, a rapid expansion of the market on this particular food item has been observed in recent years. Since 1997 BRAC has also intervened in this sector and currently BRAC ranks second to Milk Vita as supplier of processed and packaged fresh milk in Bangladesh, BRAC has about 20% of the total market share.

The main objectives of this study were to review the existing milk production, consumption and marketing situation in Bangladesh and to develop policy issues/implications on the improvement in the market.

The specific objectives were;

1. to review and document existing milk production and marketing systems (informal and formal) of milk and milk products in rural Bangladesh;
2. to illustrate current consumption patterns of milk amongst different groups, sources of milk consumed and their extent of processing;
3. to assess the rationale behind BRAC's intervention in this sector;
4. to study the forward and backward linkages in collection, processing, packaging and marketing of fresh milk
5. to find out marketing constraints and formulate policy suggestions for improving the marketing system

Methodology of this study

The study uses available published and unpublished materials received from different sources including the internet. Primary data were collected from BRAC Dairy, Milk Vita, AMO milk and Aftab milk. Several focus group discussions were conducted with the milk producers, local milk processors (*Ghoshal*) and market intermediaries (*goala*, milk collectors) from Shahajadpur of Pabna district – the major milk producing area in the country. In-depth individual interviews were also conducted with BRAC's field level management staff involved in milk collection process of BRAC Dairy.

Data on current milk consumption used here have been extracted from the main BRAC/IC study survey conducted in April-May on 333 households from rural areas, urban slums, char areas and BRAC local level staff. The survey along with other information collected data on household milk consumption, expenditure, sources of milk consumed and the extent of processing of the milk consumed.

II. Livestock Sector in Bangladesh

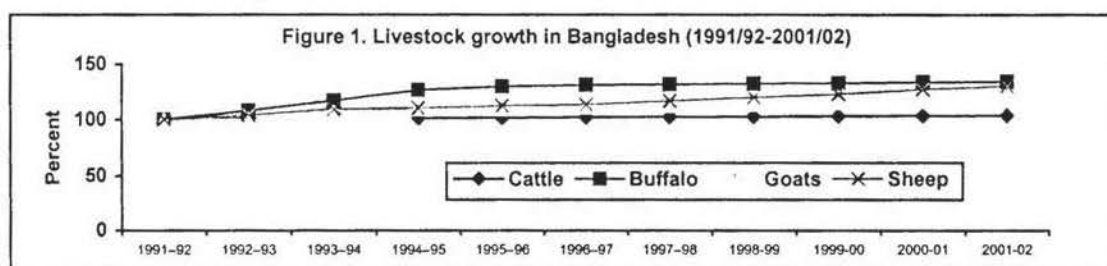
The livestock sector in the economy of Bangladesh, as well as in other South Asian countries economies, occupies a very important place. It provides (a) energy in the form of draft and traction power for various activities and fuel for cooking and other heating purposes; (b) food in the form of milk, milk products and meat; (c) raw materials in the form of wool, hair, skins, hides, bones, hoof and horns; d) a number of other products of pharmaceutical and industrial use; (e) manure for crops and (f) cow dung for fuel. The dairy sector especially has been the subject of much attention to increase the availability of many of these resources.

Livestock rearing is an integral part in the mixed farming system of Bangladesh. According to the Department of Livestock Services (DLS 2002) in 2001-02 there were about 23.72 million cattle, 0.86 million buffalo, 34.6 million goats and 1.24 million sheep. Milking cows account for about 45% of the total cattle population. Compared to 1991-92 the cattle population has increased about 0.89 million. In absolute numbers it was the highest increment but in terms of percentage it was the lowest because of its higher initial base - highest increment was for goats followed by sheep and buffalo (Table 1 Figure 1).

Table 1. Number of livestock in Bangladesh by species (millions)

Year	Cattle	Buffalo	Goat	Sheep
1991-92	22.83	0.73	25.40	0.95
1992-93	23.01	0.73	27.49	0.99
1993-94	23.12	0.78	29.74	1.04
1994-95	23.15	0.80	32.18	1.05
1995-96	23.19	0.80	33.02	1.07
1996-97	23.32	0.81	33.33	1.08
1997-98	23.40	0.82	33.50	1.11
1998-99	23.48	0.83	33.67	1.14
1999-2000	23.56	0.84	33.84	1.17
2000-2001	23.64	0.85	34.01	1.21
2001-2002	23.72	0.86	34.19	1.24
Total increment from base year (%)	3.89	17.8	34.6	30.5
Annual Increment (%)	0.39	1.78	3.46	3.05

Source: Directorate of Livestock, Bangladesh (2002).



Around 90% of the total milk comes from cows and the remaining 10% from buffalo and goats. About 52% of the male cattle, 62% of female cattle and 61% of cattle less than three years

old are raised by small- and medium-sized farms with average landholding of 0.05-2.49 acres and 2.50-7.49 acres respectively)¹ who produce most of country's milk. The large farms with landholding more than 7.5 acres who account for 8.4% of the total country's population own 32.4% of the total cattle population. The number of cattle reared by types of farm size households vary significantly. Saadullah and Hussain (2000) found the overall average herd size per livestock farm household was 3.5 cattle which was 2 cattle for the landless farm, 2.9 cattle for the small farm, 3.7 cattle for medium farm and 4.4 cattle for the large farm households (Table 2). Patterns of utilization of labour on dairy farms (Alam 1994) show that each mini dairy farm creates the opportunity for employment of 1.78 person-days of which 1.07 person days for male and 0.71 person days for female labour. The use of female family labourers was highest in the case of small farms (1 person-days for female against 0.5 person-day for male) (Table 3).

Table 2. Average herd/flock size by different types of livestock farm households

Types of livestock	Average herd/flock size (number) by type of farm household				Overall average herd/flock size (No)
	Landless farm	Small farm	Medium farm	Large farm	
Cattle	2	2.9	3.7	4.4	3.5
Goats and sheep	4.8	12.1	11.7	1.2	7.45
Poultry	8.6	14.9	14.7	7	11.3

Source: Saadullah and Hussain (2000).

Table 3. Pattern of utilisation of labour on dairy farms.

Type of farm	Person-days used/farm family per day						Total (person-days)		Overall total (person-days)
	Family labour		Casual labour		Permanent labour				
	Male	Female	Male	Female	Male	Female	Male	Female	Male + female
Large	0.25	—	0.5	—	1.5	0.25	2.25	0.25	2.5
Medium	0.5	0.75	0.4	—	—	—	0.9	0.75	1.65
Small	0.5	1	—	—	—	—	0.5	1	1.5

Source: Alam (1994).

Animals are of great importance for the landless and small farmers. Landless and small farmers depend largely on livestock for their subsistence. The self-employment generation and total income share of the animals tend to increase as the farmers' resources, especially land area, decrease. Most of the NGOs working for poverty alleviation emphasis small-scale livestock and poultry rearing for improving the livelihoods of landless farmers and smallholders.

Breeds of cattle

According to Miyan (1996) around 97% of the cattle available within the country are local² and only 2.8% are crossbred with *Sahiwal*, *Sindhi* or *Hariana*. Indigenous cows are characterized by low yields, short lactations and long calving intervals. The average milk yield of indigenous cows is about 200-300 litres in a lactation period of 180-240 days while the crossbred cows in some pockets produce 800-1000 litres in a 210-240 days of lactation period. The cows are

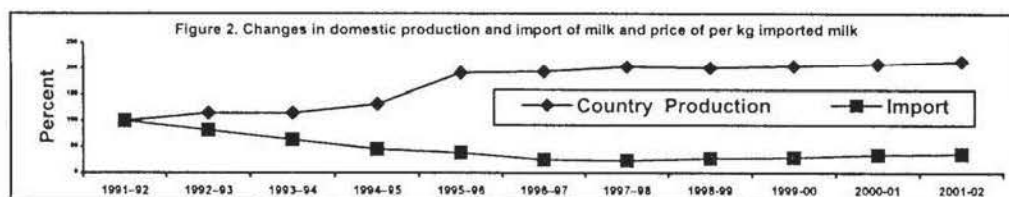
¹ In Bangladesh 80% of the rural households are small scale farmers holding 0.05–2.49 acres of land

² Local or deshi cattle are typically of small stature. They largely feed on agricultural by-products and also less vulnerable to diseases and parasites compared o the crossbreed ones.

mostly maintained as bull mothers with little surplus milk (0.5 to 1.5 litres per day) available for household consumption. Although the local cattle produce less milk compared to the crossbred ones, they are well adapted to the local feed resources³, local housing facilities and scavenging systems. Their feed requirements i.e., kg feed required/kg of product, are relatively lower..

III. Dairying

The livestock sector generates 20% of full-time employment in Bangladesh (DLS 2000). More over it is the predominant source of income generation (Miyan 1996). For decades, Bangladesh has had a large domestic market for milk and milk products. Although milk production has more than doubled during the 1991/92-2001/02 years (Figure 2) due mainly to recent government policy (it includes breed improvement through artificial insemination, restriction on export of molasses and establishment of modern dairy processing plants resulting overall increase in average yield of milk production per cow) and to NGO involvement in the provision of soft loans to establish small dairy farms and improve veterinary health care services, the current per capita availability of milk and milk products (32.6 ml per person per day which have also increased accordingly) is much lower than the demand⁴ of 129 gm which is lower than the FAO recommended body requirements of 250 gm. The shortfall in supply was largely filled by imported milk and milk products at subsidized rates. The domestic curve shows a slow growth from 1991/1992 to 1994/95 but in 1994/95 there was a big jump in domestic production of milk which actually indicates a fall of import during the period (1991- 1995). A sustainable domestic growth of milk production and a stable import is seen in the later part of 1996-1997.



Majority of dairy farms in the country are private which can be categorized into five different groups:

1. Dairying for home consumption - The large and medium size farmers keep 1-3 cows to meet primarily their household demand for milk products, the surplus being sold in the local market;

³ Cattle are principally fed by agricultural by-products, mainly rice straw which constitutes more than 90% of total cattle feed energy intake. They are also grazed on natural pastures of non-arable land including land around canals, river embankments, roadsides and railways, communal grazing land, homestead forest or fallow land. Shrub and tree leaves, tender shoots and twigs are also traditionally used in the village as fodder. (Tareque and Saadullah, 1998)

⁴ Demand for milk has been calculated by Ahmed (2000) considering consumers' willingness and economic ability to buy the product.

2. Rearing of cows for dual purposes (draft and milk) – Households depending mainly on draft power for cultivation usually keep 2-6 cows including both bulls and dairy cows and often have to use their dairy cows for ploughing. During the off season when cows are free from agricultural farm use they produce milk which is usually sold in the market;
3. Small-scale dairy farming – The small- and medium-sized livestock households with financial and technical support from the government, NGOs and cooperatives manage to procure 2-5 cows. They usually sale all their milk and milk products in the market;
4. Medium sized commercial dairy farming – The medium sized households receiving mostly government incentives or cooperative support establish dairy farms where they usually rear 6-25 cows for market sale of milk and milk products;
5. Private large commercial dairy farms – These commercial operations establish modern dairy farms and keep 26 + cows.

There are also eight government dairy farms, these are basically used as breeding farms for supplying of heifers to small-scale farmers.

IV. Consumption of milk and milk products: the survey results

This section presents survey results on consumption of milk and milk products at household level. As part of the study project a household survey was conducted on 333 households which included both poor, middle class and rich households from urban slum, rural and char areas. It also included 23 BRAC staff as a proxy for the middle earning group residing in semi-urban areas (Upazila centres) with their family⁵. Table 4 presents summary results on consumption frequency of milk and milk products, per capita per day expenditure on milk and its share to total food expenditure. According to table almost 60% of the respondents reported that they had had milk items in their food basket at least once within the last 72 hours of the reference period. Milk consumption was highest in Char areas followed by BRAC staff. Within low and high vibrant villages milk consumption was higher for low vibrant remote villages where market linkages were less developed and consequently producers were not always able to sell their milk for cash. The lowest consumption of milk was found amongst the slum dwellers whose per capita milk and total food expenditures were the lowest. All the BRAC staff included in the sample resided with their family in Upazila centres⁶ and since they were in salaried job they could afford to spend more on food and secondly since they have to depend on market sources for every item in their consumption basket it is clear that expenditure should be higher than the rest of the sample. Importantly, they actually spend comparatively more on milk than other food items, possibly due to their knowledge of the food value of milk and milk products. Mean results by poverty category give the indication of the relationship between milk consumption and households' ability to purchase certain food items – i.e., the richer the household, the higher the probability of consuming relatively better quality food with high price such as milk.

Table 5 presents results on how frequently a household consumes milk and milk products. It also shows that among the rich, of those who could afford to purchase it, about 85% consumed milk at least once daily which was totally opposite to the case of the poor, especially among the slum dwellers. About 18% of the slum dwellers, who source the majority of items from the

⁵ Details on sampling are given in the household survey report of this project

⁶ Lowest administrative unit

market,, cannot afford to buy milk even once during year. Among the total sample only 50% could have milk in their food basket at least once daily.

Table 4: Consumption pattern of milk by area and poverty groups

Indicator	Sample Groups					Poverty			Total
	Low vibrant village	High vibrant village	Slum	Char	BRAC Staff	Poor	Middle class	Rich	
% of hhs consumed milk in last three days (%)	61.7	58.7	42.5	73.3	69.6	43.6	69.1	88.1	59.8
Per capita milk expenditure per day (Tk.)	1.23	1.21	0.64	1.61	1.47	0.64	2.18	2.26	0.55
% of milk to total food expenditure	4.68	4.36	2.61	7.42	5.34	3.28	5.8	6.35	4.61
Per capita food expenditure (Tk.)	24.24	24.95	19.38	21.64	32.05	18.38	26.30	36.62	24.28

Source: Field survey 2003

Table 5: Frequency of milk consumption (%)

Indicator	Sample Groups					Poverty			Total
	Low vibrant village	High vibrant village	Slum	Char	BRAC Staff	Poor	Middle class	rich	
Once daily	30.8	31.7	17.5	46.7	43.5	18.6	37.2	53.7	30.9
Twice daily	17.3	15.9	5.0	6.7	13.0	8.1	18.1	23.9	14.1
Thrice daily	1.5	5.6	5.0	3.3	17.4	2.3	6.4	7.5	4.5
Once weekly	8.3	5.6	5.0	10.0	4.3	9.3	7.4		6.9
Twice/thrice weekly	9.0	2.4	2.5	10.0	4.3	6.4	6.4	3.0	5.7
Once fortnightly	6.8	8.7	10.0	3.3	-	7.6	9.6	4.5	7.5
Once monthly	5.3	5.6	2.6	10.0	8.7	7.6	5.3		5.4
Sometimes	9.8	14.3	20.0	3.3	8.7	16.9	6.4	7.5	12.0
Hardly ever	6.8	4.0	10.0	3.3	-	10.5	1.1		5.7
On special occasion	2.3	1.6	5.0	-	-	3.5	1.1		2.1
Never	2.3	4.8	17.5	3.3	-	9.3	1.1		5.1
Total	100.0	100.0	-	-	-	100.0	100.0	100.0	

Source: Field survey 2003

Table 6 presents data regarding which household members usually consume milk. A positive aspect of their responses was that in 75% of cases all the household members actually consumed the milk. Around 16% of the households feed milk only to the children under five. A quarter of the milk consumed by the household is home produced, another 51% usually purchase it from the local *hat/bazaar*, i.e., lower level market and 22% used to buy from the permanent market place (Table 7). In Char areas 69% of the milk consumed was home produced, here proportionately higher percentages of the households keep dairy cows because

of the favourable environment for livestock rearing. On the other hand, 100% of the slum dwellers and BRAC staff had to depend only on market sources. Dependence on market sources was also higher among the poor who usually can not afford to keep dairy cattle of their own.

Table 6: Who usually consume milk by sampled groups (%)

Consumers	Low vibrant village	High vibrant village	Char	Slum	BRAC staff	Poor	Middle class	rich	Total
None	2.3	4.8	2.9	17.5	5.1	9.3	1.1	-	5.1
All household members	76.7	78.6	79.4	57.5	75.4	72.1	78.7	79.1	75.4
Children below five year of age	14.3	15.9	14.7	20.0	15.6	15.7	16.0	14.9	15.6
School going children	5.3	.8			2.4	2.3	2.1	3.0	2.4
College going children	1.5		2.9	5.0	1.5	.6	2.1	3.0	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Field survey 2003

Table 7: Sources of milk consumed (%)

Sources	low vibrant village	high vibrant village	char	slum	BRAC staff	Poor	middle class	rich	Total
Home produced	28.4	26.5	69.0	-	-	19.0	26.1	44.8	26.6
Low level market*	51.7	59.3	24.1	29.0	69.6	58.2	48.9	37.3	51.0
Fixed market**	19.8	14.2	6.9	71.0	30.4	22.9	25.0	17.9	22.4

*bought from neighbour/local trader, bought from *Haat*, bought from street trader, ** bought from fixed *Bazaar*, bought from shopkeeper

Source: Field survey 2003

Table 8 describes the extent of processing of the milk consumed at the household level. It should be mentioned here that except the slum dwellers of Dhaka city all other households were selected from villages or Upazila levels where the processed and packaged milk had not yet reached the market and ,therefore, they need to fully depend on local supply. In case of shortage in supply they have to depend fully on their own production. What is important here is that although processed and packaged milk is more expensive than the unprocessed and unpackaged fresh milk, about 52% of the slum dwellers who ever consume milk choose the processed and packaged one and buy it from the retail shops. Urban dwellers usually consume modern processed fresh milk – because that is the most common source of fresh milk. However, milk consumption over the last five year period among slum dwellers has declined significantly (Table 9). The respondents were asked to mention what they think about whether consumption of milk over the last five year period increased or not. Thirty-seven percent

reported positive changes, whilst another 39% reported negative growth and the negative responses were much higher among the poor which might have some nutritional implications on health.

Table 8: The extent of milk processing (%)

Extent of processing	Low vibrant village	High vibrant village	Char	Slum	BRAC staff	Poor	Middle class	rich	Total
Locally processed	93.2	85.1	96.6	27.3	91.3	81.4	83.9	88.1	83.5
Processed outside	6.8	14.9	3.4	21.2	8.7	12.2	9.7	10.4	11.1
Processed and packaged	-	-	-	51.5	-	6.4	6.5	1.5	5.4
Total	100	100	100	100	100	100	100	100	100

Source: Field survey 2003

Table 9: Perception of changes in milk consumption over the last 5 year period (%)

Change	Sample Groups					Poverty			Total
	Low vibrant village	High vibrant village	Slum	Char	BRAC Staff	Poor	Middle class	rich	
Increase	38.0	32.5	27.3	48.3	52.2	26.5	47.3	47.8	37.1
Decrease	36.2	42.1	48.5	34.5	34.8	45.2	38.7	26.9	39.4
No Change	25.8	25.4	24.2	17.2	13.0	28.3	14.0	25.3	23.5

Source: Field survey 2003

V. Profitability of milk production

Little research has been done on the profitability of dairy cattle rearing in Bangladesh (Alam, 1995; Kabir and Talukdar, 1997). Alam's study results indicate that the production cost of milk per litre from both local and crossbred cows far exceeds its market/selling price. One of the main reasons for high cost of production is the low milk yield per cow (1.5 litres/day for local and 2.5 litres/day for crossbred cows).

Milk is only one of the many direct products the farmers received from dairy cattle rearing. They produce calves which can be sold at a very good prices, this is the major income source from dairy cow rearing. Cow dung is currently in high demand for fuel and fertilizer use. The use of cows for draft power also reduces the production cost in agriculture, this can be considered as indirect income. Kabir and Talukdar (1997) did a financial analysis and estimated gross costs and benefits earned from dairy farming in selected areas of Tangail district and the study results show that although cost of per litre of milk is higher than its market price, for the farmer, dairy farming is financially highly profitable if the value of all the other direct and indirect products is considered. The cost⁷ and return⁸ data for this study were collected from

⁷ Includes cost of feed, labour, veterinary care, artificial insemination (AI) and miscellaneous costs.

dairy farming households with 10 local and 10 cross-breed cows over a period of three lactations and interestingly results show that cost of production in the 1st lactation year for both local and crossbred cows was twelve times higher than their gross return. In the second and third lactation years although cost of production increased 70% and 115% respectively, compared with the cost incurred in the 1st year, average gross return for the 2nd and 3rd lactation years increased many times compared to the 1st year return (Table 10) The total three-year return from dairy farming with local cows was found to be 23% higher than its total costs. On the other hand, the three-year return from crossbred cows exceeded its total costs by 95% indicating higher profitability of cross-breed cows. The study also revealed that the earning capacity from investment in dairy, especially on crossbred dairy cows far exceeds the opportunity cost of capital in the formal capital market which was about 6.5% annually. Sustaining the increasing gross return will largely depend on the assured supply of accompanying inputs such as feed and veterinary services, and improved milk marketing facilities closer to the doorsteps of the farmers.

Table 10. Estimated gross costs and benefits earned from dairy farming

Lactation year	Total cost (taka)		Gross return (taka)	
	Local (n = 10)	Crossbred (n = 10)	Local (n = 10)	Crossbred (n = 10)
1	54,524	58,179	4380	4380
2	92,585	98,798	148,636	247,966
3	117,054	124,911	173,007	297,117
Total	264,163	281,888	326,023	549,463

Note: US\$ 1 = taka 57 at 2001 exchange rate.

Source: Kibir and Talukder (1997).

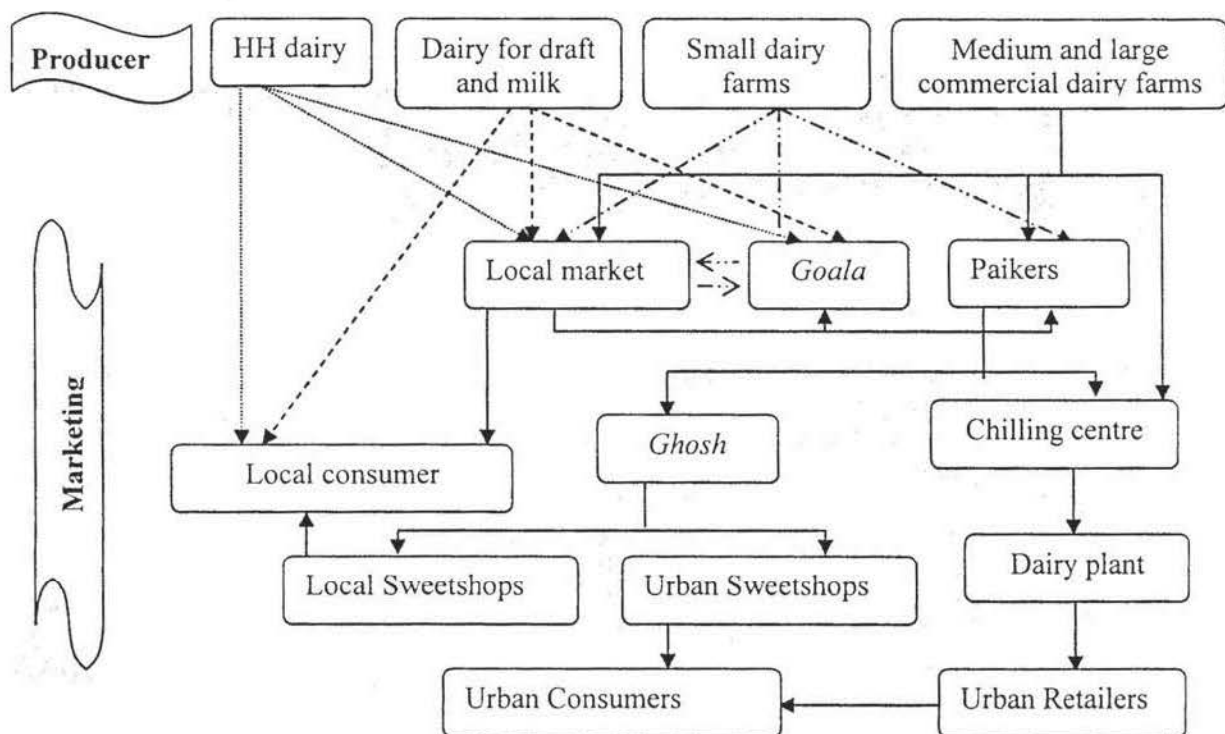
VI. Marketing of unprocessed fresh milk

Although in rural Bangladesh almost two out of three households rear cattle, the first two small dairy rearing group households use their milk primarily to meet their own consumption needs. A part of their surplus milk goes directly to other neighbourhoods who buy their milk from local producers. There are also *Goala* who collect milk from the farmers' houses through door to door visits and also from the local market, they prepare *ghol* and *ghee* with the collected milk and sell those products in the local market. Sometimes the small-scale producers bring their milk to the market place on a regular basis if they can not make any regular arrangements to sell it from their own house. Small dairy farms producing more than 5 litres of milk/day also sell part of their milk in the local market. There is a group of people called *Paikars* who do regular business buying and selling milk in larger quantity. They usually have regular contact with all the commercial dairy farms producing larger quantities of milk for market sale and also with the market intermediaries (*Ghosh* and chilling centres), who buy milk in larger quantity on a regular basis. The *paikers* sometimes collect milk from the local market if their daily supply exceeds their total demand. The *paikers* after collecting milk from the producers and also from the local market supply it to the *Ghosh*, (who use milk to prepare curds and ghees and sell them to the sweetshops), Chilling centers of different milk processing plants and also to different social gatherings e.g. reception parties, the latter use it for the preparation of some dessert items. The chilling centres have also established their own network by organizing

⁸ Includes market value of milk, dung and calves produced.

cooperative dairy farms or groups to collect their required volume . In the country there are already 9 milk processing manufacturers/plants involved in collecting, processing and marketing of fresh milk from dairy farms to the urban markets (Figure 3). It should be remembered that facilities for sale to chilling centres are limited to only selected areas – the areas of concentrated milk production.

Figure 3. Production and Marketing of unprocessed milk



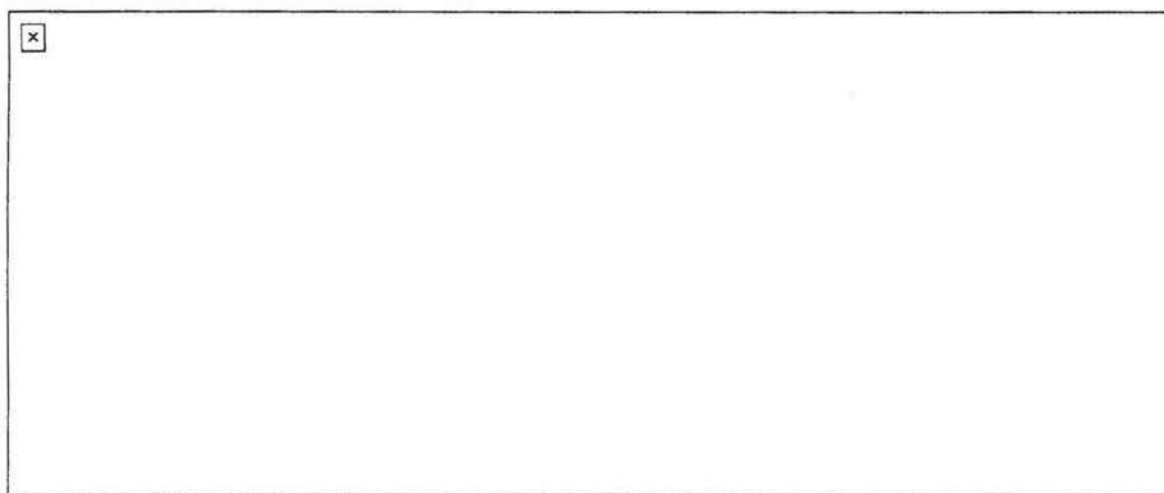
VII. Marketing of processed fresh milk

The history of processing and marketing of fresh milk in Bangladesh goes back to 1952 when a social worker took the initiative by forming the Eastern Milk Products Ltd. a private company and started marketing dairy products under the trade name of Milk Vita. In 1965, this dairy was transferred to the Eastern Milk Producers' Co-operative Union Ltd., the first milk producers' co-operative formed in the country. Around 100 village level milk producers' co-operative societies were formed around Lahirimohanpur where the plant was located in Sirajganj district. During the same period, another dairy plant was established at Dhaka and run by the National Co-operative Marketing Society. This marketed liquid milk in the city. Eventually, output of both the dairies declined.

In 1973, the Government initiated a dairy co-operative of smallholder dairy farmers following the Indian experience and launched a dairy development program - 'Co-operative Dairy

Complex' with financial assistance from Denmark. While taking over the dairying infrastructure created at Lahirimohanpur and Dhaka, the new organisation maintained the earlier name of Eastern Milk Producers' Co-operative Union for a few years until it was renamed as Bangladesh Milk Producers Co-operative Union Ltd. in 1977. Today there are around 65,000 smallholder dairy farmers from 925 villages in 15 districts who have joined as members of around 565 primary Milk Vita co-operatives covering about 925 villages in 15 districts of Tangail, Manikgonj, Tekerhat, Baghabarighat, Sree Nagar and Rangpur areas, supplying over 538,000 litres of milk per day. Farmer members pool their surplus production at the primary dairy co-operative societies which arrange regular cash payment on the basis of fat content and the Bangladesh Milk Producers' Co-operative Union Ltd. (BMPCUL) popularly known as Milk Vita ensures regular collection, processing and marketing of milk and milk products. The dairy co-operatives also provide necessary support services to farmer members for animal breeding, feeding, health and training in animal management (Figure 4). In addition, a major part of the surplus earned by the central dairy co-operative through marketing milk and milk products is paid to the members (for details please see Annex 1).

Figure 4. Milk Vita's chain of marketing milk from producers to consumers



VII. The BRAC Dairy and Food Project

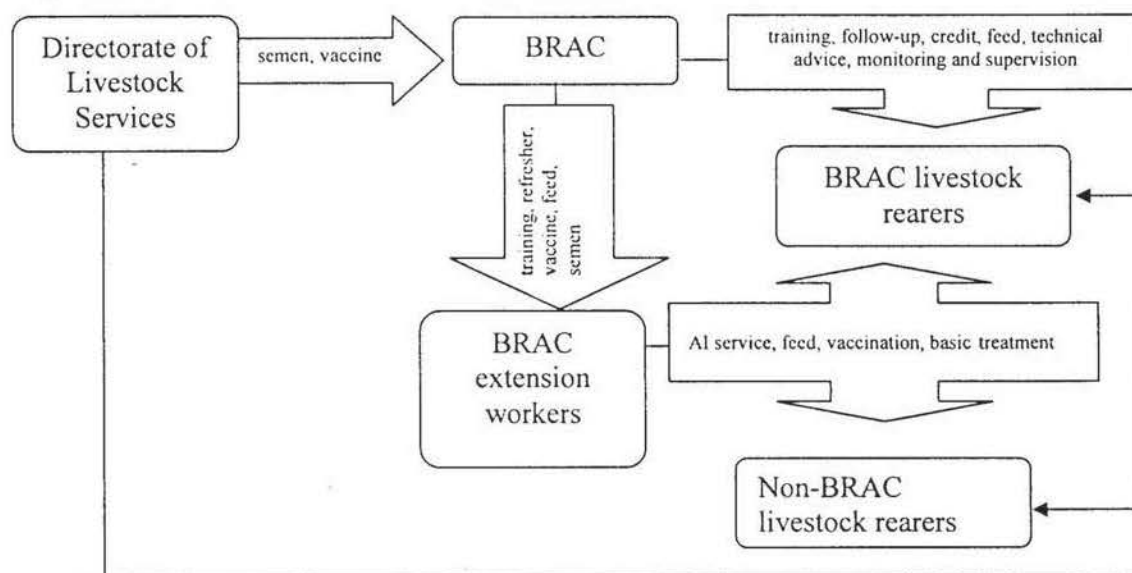
History of BRAC dairy

BRAC from 1978 to 1982 provided small scale loans to the landless for cattle rearing as part of its micro-finance programme. There were no other services such as skill training or technical support and results of the internal monitoring reports did not show impressive results, due mainly to poor farmers lacking access to modern technological information and for following the traditional methods of rearing and using low productive local breeds. The mortality of the animals was also very high because they did not receive timely and adequate veterinary services from local government extension service providers. Lack of adequate knowledge on livestock rearing, and poor maintenance of hygiene were also causes for higher mortality. The number of government veterinary service providers per *Upazilla* was also inadequate and, therefore, they were not always accessible during emergencies. BRAC realized that for the

landless the opportunity cost of rearing cow is very high considering the fact that the poor usually face feed shortages and need to practice alternative feeding methods which are more costly. Rearing of low productive local cows was a factor resulting in dairy cattle rearing not being cost-effective. Artificial insemination (AI) was found to be the most cost-effective way of improving the breeds but there were few skilled AI service providers who could provide door to door services at a reasonable price. It was then realized by BRAC that for the development of this sector in addition to financial support a package of services was necessary.

In 1983 BRAC started experimenting on a new livestock programme in Manikgonj with a package of services including credit, skill training, AI and veterinary services which were expected to reduce animal mortality, improve the breed, increase productivity and all of those were expected to have an impact on income increase for the poor. From the participants' list the best performers were chosen by BRAC, then trained on livestock rearing and management. They were prepared as para-professionals who were expected to work in their community and provide their services to the farmers at a small charge. BRAC's new experiment for livestock development was accepted by the government as a successful model for widespread implementation. The current livestock programme of BRAC includes milching cow rearing, beef fattening, goat rearing, artificial insemination and fodder cultivation activities. These projects target landless and marginal farmers, particularly women, as part of their rural development and income-generation activities. Mostly, they provide credit facilities and some of them provide support services to small-scale dairy farms. These activities are implemented in collaboration with the Department of Livestock Services, Government of the People's Republic of Bangladesh. Figure 5 describes how BRAC's livestock rearing model is functioning. As shown in the figure BRAC made an official agreement with the Directorate of Livestock Services who provide BRAC with imported HYV semen and vaccination to BRAC. The livestock rearers receive these services from BRAC through trained field level extension workers who provides door to door services at a very low price. BRAC now has a bull centre established in Mymensingh.

Figure 5. The BRAC model for Livestock Rearing



BRAC's Dairy and Food Project

BRAC's motivation and the provision of the necessary inputs for livestock rearing including training, credit, modern technology, feed and veterinary services played a significant role in increasing livestock rearing among its beneficiaries and the milk yield. BRAC realised that for the landless poor milk can be an important source of income if they can find an ensured market with competitive prices. As mentioned earlier in rural Bangladesh the market demand for fresh milk is very low as the majority of consumers who could afford to buy milk also raise dairy cows to meet their own consumption needs. Although there is a market for milk in the urban areas, its not well connected with the producers and therefore the producers have to sell their product at a very low price to the local market intermediaries - *Paikars, Goalas, Ghosh*, and sweetshops. These intermediaries usually offer low prices and sometimes farmers have to sell their milk to those market intermediaries on credit. Milk Vita and other small milk processing manufacturers purchase milk from their own contract producers on a regular basis and if there is a shortage in supply only then do they go to the local market to cover their shortage in supply. To link the poor producers with the urban market and to provide fair prices to the poor producers BRAC initiated the Dairy and Food Project in 1998.

In 1998 the project started with the establishment of seven chilling centres in Sahajadpur, Pabna and Manikgonj districts with the total handling capacity of 27 thousands litres per day. Over time the project expanded to another five districts by opening 13 new chilling centres of which 3 were established in Pabna. The total number of chilling centres in Pabna is now seven with the capacity of handling 41 thousand litres/day. Of the 45-50 thousand litres collected 32-35 thousand are now supplied from Pabna and another 3,000-4,000 are received from Shahajadpur (of Sirajgonj district), near to Pabna district headquarters, with the remainder from other districts (Table 11). Historically Shahajadpur and Pabna are the highest milk producing areas and during our field visit in Pabna district we noticed a high concentration of chilling centres associated with all the available milk manufacturers functioning within the country.

BRAC's milk collection process

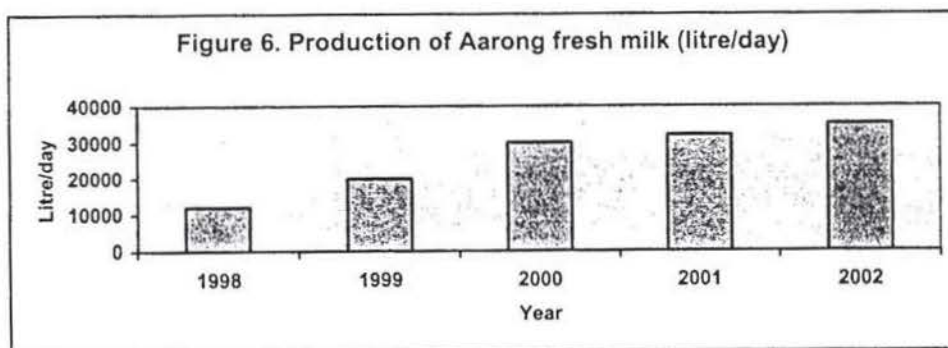
Like Milk Vita, BRAC also follows the group approach in fresh milk collection. Initially BRAC formed groups with a minimum of 20 milk producers, the majority of whom are micro-finance borrowers who invest their loan in livestock rearing and who have problems with marketing of milk. The milk producers have a verbal agreement, selling their milk to BRAC chilling centres and they employ one person who is responsible for milk collection from the group and supplying it to BRAC chilling centre twice daily. The milk collectors receive Tk. 1 per litre from the farmers as commission, of which 50% he has to spend on transportation. BRAC now has 161 primary societies with a total membership of 4493. From each society BRAC receives 40-1800 litres of milk daily.

Table 11. The BRAC Chilling facilities

Sl. No.	Name of Chilling Centre (CC)	Year of establishment	Handling capacity '000 l/day	Sl. No.	Name of Chilling Centre	Year of establishment	Handling capacity '000 l/day
1	Shahajadpur CC, Serajgonj	1998	6	11	Darogram CC, Manikgonj	1998	2
2	Bera C & B CC, Pabna	1999	10	12	Panch-bibiCC, Joypurhat	2000	4
3	Bera CC, Pabna	1998	2	13	Kalai CC, Joypurhat	2000	2
4	Sujanogor CC, Pabna	1998	2	14	Shibgonj CC, Bogra	2000	2
5	Ataikula CC, Pabna	1998	3	15	Bochagonj CC, Dinajpur	2001	2
6	Vhangura CC, Pabna	1998	8	16	Birampur CC, Dinajpur	2001	2
7	Foridpur CC, Pabna	2000	10	17	Birgonj CC, Dinajpur	2001	2
8	Demra CC, Pabna	1999	6	18	Thakurgaon CC, Thakurgaon	2002	2
9	Betila CC, Manikgonj	1998	2	19	Dinajpur Sadar CC, Dinajpur	2002	2
10	Kawalipara CC, Manikgonj	1998	2	20	Amtala – New CC, Barguna	2003	2
Total			51				22

Products of BRAC's dairy and marketing

BRAC dairy is currently producing 8 different products⁹ of which fresh milk is number one. Production of fresh milk has increased more than three times within the very short period since its initiation (Figure 6). Production of other products has also increased. Currently BRAC is controlling approximately 20% of the market for fresh milk and stands in second position after Milk Vita (Table 12). It should be mentioned here that processed fresh milk constitutes only 5% of the total fresh milk consumed in the country and all the processing companies target the urban market – mainly Dhaka city. Aarong milk, like all other manufacturers, is marketed to certain urban city centers, mainly to Dhaka city and its nearby city centers i.e., in Narayanganj and Gajipur, Chittagong, Feni, Comilla, Choumuhani, Baraiahhat of Chittagong division and Hobigonj, Balagonj, Bianibazar and Srimongal of Sylhet division (Figure 7).



⁹ Includes fresh milk, low fat milk, chocolate milk, butter, ghee, yoghurt, mango milk drink and UHT milk packet.

An important point to mention here is that all the processing plants have surplus handling capacity meaning that there is a shortage in market demand in those urban cities where most of the manufacturers target. Shortage in supply of milk from farmer producers may also be a reason.

BRAC dairy like all other milk manufacturers follows a similar marketing strategy for their products. BRAC dairy has its own distribution and sales centers in all those urban centers mentioned above. It has 22 commissioned agents each of which, on average, employ 10 rickshaw/van puller who receive milk from a fixed delivery point and then supply to the retailers. It has been estimated that for marketing of 35 thousands litres/day of fresh milk by BRAC dairy a total of 627/person-days employment has been created i.e., for per litre milk marketing creation of employment is 0.02 person/days which include activities like collection, of raw milk, processing, transportation and marketing of processed fresh milk.

Figure 7: Collection and marketing link of fresh milk by Aarong dairy and Milk Vita



Table 12. Daily sales of processed liquid milk by dairy manufacturers.

Name of enterprise	Number of Chilling centres	Handling Capacity '000 litres/day	Average milk sales ($\times 10^3$ litres/day)	Market share (%)
Milk Vita	12	135	118	63.79
Aarong	20	na	35	18.92
Amomilk	1	14	5	2.70
Shelaida	na	na	4	2.16
Bikrampur	na	na	3	1.62
Savar Dairy	na	na	2	1.08
Aftab Dairy	2	11.5	6	3.25
Safa Dairy	na	na	3	1.62
Tulip Dairy	na	na	4	2.16
Others	na	na	5	2.70
Total			185	100

na- not available

Source: G. C. Saha and S.A.M.A. Haque Small-scale processing and marketing in Bangladesh including reference to micro-credit facilities (good market access)—Milk Vita: A case study

VIII. The milk groups, their production, consumption and the prices

Price for fresh milk in rural and peri-urban markets is usually stable across the seasons, with variations of plus/minus Tk. 2-5 at the beginning and end of any lactating periods. Higher market price fluctuations are observed during periods associated with social occasions such as social ceremonies, religious festivals and funerals, when there is an increase in demand over supply. It is normal practice in Bengali culture that in social occasions a sweet dessert item is prepared with milk (like sweet curds, sweets and phirni) and this is usually served with the main dish. It is also important to note that in Hindu majority community areas with a different calendar of marriage, religious and social occasions, the price fluctuation is greater. This is no doubt due to the higher demand from this ethnic group for milk based products. Prices of milk supplied to different chilling centers are determined/fixed by fat content, i.e., higher the fat the higher the price. Since all the milk manufacturers have some kind of verbal (and sometimes written) agreements with their milk producing groups/co-operatives to serve their demand and fix a limit for each and every group/co-operative society, a little fluctuation in market price does not usually affect their rate. If the market price increases significantly then the manufacturers are bound to increase their price rate to receive adequate quantities. Here it is important to mention that almost all the representatives of different dairy manufacturing companies reported that they could not utilize their total handling capacity of collecting higher quantity of milk because of marketing problems. Discussions with the Milk Vita and BRAC Dairy cooperative/group members revealed that almost every week the respective chilling centers make an off day and for that reason the members have to make alternative arrangements to sale their milk if such difficulties arise. During our field trips we collected data from 80 Milk Vita cooperative members and few data from 177 BRAC Dairy group members on their dairy which have been presented in Table 13. According to the Table both the producer groups use any possible marketing chain to sell their output. For BRAC groups they also sell major share (48%) of their output to Milk Vita and only 28% to BRAC dairy. The Milk Vita cooperative members also use BRAC marketing chain.

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Staff of all milk manufacturing companies are aware of those problems. They stated that such kind of situation usually arises during the peak lactating periods when the chilling centers cannot purchase the surplus volume of milk produced by their group members because of the fact that all the companies target the same urban market where demand for fresh milk is more or less stable during the year round. It means that all the companies should diversify their products and secondly there is a high demand for powder milk in semi-urban and rural areas where there is a lack of fresh milk preservation facilities. For the semi-urban and also rural consumers the imported powder milk is costly which many of them cannot afford to buy. To target those markets, companies should go for powder milk production. Milk Vita has already established a powder milk plant which we hope will create extra opportunities to sell all the milk produced by its cooperative members and also to some extent the other milk producing groups and farmers to sell their milk.

About household consumption of milk although results of the main survey conducted on different group of people show a negative or inverse relationship between milk consumption and poverty, here we found that both the Milk Vita and BRAC Dairy cooperative/group members use a certain proportion of their produced milk for their household consumption and according to three-fourth of them their milk consumption has increased over the five year period.

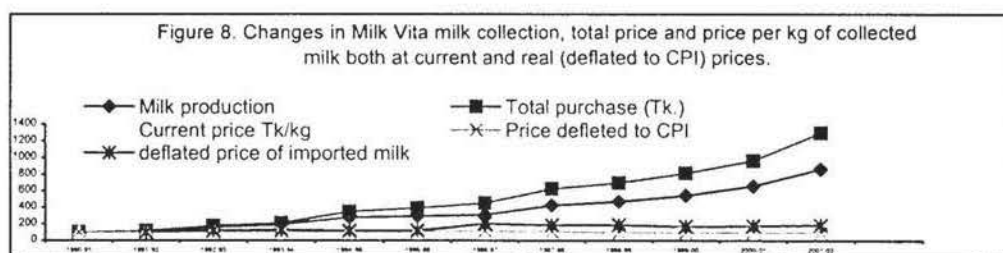
Table 13. Milk production, consumption and marketing of Milk Vita and BRAC milk producers in Pabna

Indicators	Milk Vita N=80	BRAC Dairy N=177	Total (Average) N=257
No of cattle	9	6	7
Ratio of milching cow	42.8	42.9	42.8
Total milk production (kg)	20.7	13.4	15.7
Milk per cow (kg)	5.5	6.0	5.8
Sale to BRAC Dairy (%)	19.4	28.1	25.4
Sale to Milk Vita (%)	47.6	48.4	48.1
Sale to others (%)	24.4	11.9	15.8
Home consumption (%)	7.4	9.4	8.8
% Changes in home consumption in the last 5 years	78.8	76.2	77.0

IX. Sharing of benefits from processing and marketing of processed fresh milk

Although Milk Vita started processing and marketing fresh milk in 1973, the competition in the market has only started recently. Until 1993/94 Milk Vita controlled 100% of the processed milk market and currently there are about 10 manufacturers involved in processing and marketing of fresh milk. Previously before 1993/94 Milk Vita used to pay less than Tk. 12 for per litre of milk supplied with 5% fat content then sell it to the market @ Tk. 21 -Tk.22 per litre with 3.2% fat. Since 1998 after BRAC's intervention, Milk Vita had to increase its purchasing price to retain their cooperative members in their supply chain. Initially in 1998 BRAC paid higher prices than Milk Vita to the farmers and currently Milk Vita's price is even a little higher than BRAC. But as shown in Figure 8 although farmers are currently receiving a relatively higher prices than before the deflated consumer price index rates show that the real price of per kg of produced milk received by the Milk Vita cooperative members has declined over time. On the other hand prices of imported powder milk at constant 1991/92 year price has more than doubled in 1997/98 after which the price declined a little which is still much higher than the base year prices. The

major positive outcome of this competing environment is that the domestic producers currently get an ensured market for their products, which ultimately inspires them to scale up their production.



During our focus group discussion sessions the respondents informed us that with an increase in competition among milk processing plants to purchase a larger quantity of milk, total market demand for milk has increased and therefore farmers are now getting fairer prices for their products which encourage them to scale up their current production. According to their estimates almost every household in greater Pabna district currently owns dairy cows and production of fresh milk in the area has doubled over the last ten years. For the poor milk is relatively cheap in comparison to fish and meat – the other direct sources of protein intake. The price of milk is relatively stable and, therefore, if they cannot afford to buy fish or meat they buy a quarter litre of milk, mix it with water, boil and consume with rice. It means with an increase in market competition, production as well as consumption of milk among the poor has also increased – i.e., both the parties involved in production and marketing benefiting from market expansion of fresh milk. Collection, processing and marketing of milk is a laborious process which also creates employment opportunities for the poor who have to sell their manual labour. On the other hand, the well-off class living in urban areas currently have direct access to processed fresh milk 100% free of bacteria and other microbes and currently dependency on imported powdered milk has declined significantly.

Generation of additional employment through processing and marketing of fresh milk

As mentioned earlier, marketing of processed and packaged fresh milk is an emerging area in urban agri-business which creates lots of direct and indirect employment opportunities for people involved in processing, packaging, transportation, distribution and marketing of packaged fresh milk. Table 14 provides results of a rough estimation of how many direct employment opportunities the sector has created so far. All data on Aarong milk and Milk vita have been collected from the respective manufacturing companies. Data on the volume of market sales and some data on staff have been received from different sources. The rest of the information, except Aarong milk and Milk Vita, have been estimated based on average information of the two big players mentioned. The estimation indicates that more than 80,000 farmers are actually linked with the marketing chains, together they actually supply more than 300,000 litres milk daily to 9 milk processing manufacturers. Collection, processing and marketing of this volume of milk also create employment opportunities for over 3000 individuals. If we considered indirect employment opportunities created in other linked sector, say in the production of packaging materials, the figures would be higher.

Table 14. Estimated Probable Employment generation, 2002

Particulars	Aarong	Milk Vita	Aftab*	Amo milk*	Shelaid a*	Bikrampur*	Saver dairy*	Safa*	Tulip*	Total
No of society members	10000	65000	1714	1210	1140	850	580	850	1150	8249
No of employee	150	1000	5	12	5	5	5	5	5	1192
No of distributors	22	50	6	5	4	3	2	3	4	99
No of milk collectors	160	556	17	22	14	10	7	10	14	810
No of transporters	295	500	40	33	27	20	13	20	27	975
Total No of beneficiary	627	2106	68	72	50	38	27	38	50	3076
Milk production (litre/day)	46000	240000	6000	5000	4000	3000	2000	3000	4000	313000
Milk sale (litre/day)	35000	118000	6000	5000	4000	3000	2000	3000	4000	180000

Source: Field survey 2003, Milk Vita 2002

XI. Summary of findings and policy implications

The overall consumption pattern of dairy products at the cross section of char, low and high vibrant rural areas with urban slum households as shown in the household survey results indicate a complex pattern of changes. Market integration appears to be associated with a reduction in milk consumption among the poorer households. The char areas are least integrated and have highest consumption of dairy products. Moving from low to high vibrancy villages the consumption of milk declines.

There is also a large income related differences suggesting high income elasticity of demand for milk products moving from poor to middle to rich. This pattern is also further supported by its low consumption level among the slum dwellers and high pattern of consumption in BRAC staff households. The positive responses regarding the changes in household milk consumption over the last five years of Milk Vita and BRAC Dairy cooperative/group members who do not belong to the poorest segment of the population is actually complementary to the household survey findings.

In terms of the level of processing local processing still dominates milk consumption, although outside processing is beginning to become more important. This trend is interestingly notable amongst urban slum and poor households.

With the intervention of BRAC Dairy and other private investors dairy processing and marketing has emerged as a well-organized, well-equipped sector. Currently all the big cities with refrigerator facilities have been brought under the marketing of packaged and processed milk. Since all the processors are directly connected with the rural small scale milk producers most of whom are poor, it provides poor, landless and marginal milk producing farmers and women in the associated communities with regular supplementary incomes. What is important to mention here is that all the companies target a few big metropolitan cities well-connected with Dhaka. This is as a result of all the processing plants being established in Dhaka and its neighbouring cities, for example, Milk Vita at Mirpur in Dhaka and BRAC dairy in Gazipur- the two major suppliers. With increasing population in Dhaka city the total demand for fresh milk has

undoubtedly increased but not at the expected rate. In the urban diet milk is considered as a tertiary source of protein intake after meat, fish and egg and people rarely use milk as part of their regular food basket and use it only for child feeding and for preparing of dessert items to treat the guests or during any religious or social occasions/festivals. Relatively higher market prices compared to other alternative choices for protein intake is another reason for the less than expected demand. Storage is another problem since the majority of people in urban areas do not have refrigerators.

Discussion with the employees from different processing plants and differences between the handling capacity and marketable volumes of milk of different plants tell us that all the plants currently have extra capacity to collect more milk if marketing can be expanded further. Since all of them target a few urban areas there is high competition among them and therefore it will be difficult, especially for small new comers to popularize their brands if there is no shortage of supply for already established and popular brands.

Other major marketing constraints include the lack of appropriate transport to move milk to lucrative urban markets and the widespread price differential between producer and consumer. The producer is usually exploited by the middleman, particularly during the high supply seasons. Among the South Asian countries the differences between producers' and consumers' prices are highest for Bangladesh (53%) and lowest (11%) in India (Malhotra, 1997) although in recent years these differences have reduced due to expansion of milk collection areas of different milk processing plants. In the nineties there was no other big competitor except Milk Vita who monopolized the market. Total demand for unprocessed milk was therefore relatively low where Milk Vita was in a position to manipulate the price. In the late nineties when Aarong entered into the market and offered relatively higher price to the producers Milk Vita had to increase their price which actually helped to balance between producers and consumers prices to some extent. If this gap can be reduced further to a tolerable level, say to the level in India, the consumers will be more able to consume this processed milk which is more hygienic. The knowledge gap among the poor consumers who treat packaged and processed milk is of low quality because of lower fat contents is also another constraint for slower market growth.

With regard to lower dairy growth this can be explained by lower milk productivity of the local breed which is predominant, consequently farmers are less interested in rearing dairy cows; small and scattered animal holdings, shortage of feed and also limited availability of grazing land are other constraining factors in commercial growth of dairy sector. The import of milk powder and butter oil from the developed countries at subsidized prices also exposed the local producers to unfair competition and discouraged local production. High incidence of parasitic animal diseases; inadequate institutional and infrastructural facilities; inadequate public and private investment in the sector; poor quality of animal health care and breeding services; lack of professional management; and lack of a well-defined national policy for dairy development are other constraining factors in rapid dairy sector growth.

There is substantial scope for increasing productivity of the dairy sector and there is a huge unmet demand of dairy products in the domestic market that can be fulfilled. There is plenty of surface (river) water available for seasonal fodder cultivation on common lands; extensive waterways available for cheap transportation; very high rate of growth of buffalo population; good scope for establishing feed manufacturing plants; good scope for culling of less productive/unproductive animals; and a good stock of indigenous cattle breeds adapted to the

local feed resources and environment but a lack appropriate government policies. As mentioned earlier there is a huge gap between the producers' and retailers' prices – it means a producer-oriented price policy is needed which may help in reducing this gap to protect the local producers. Subsidies for imported dairy products should be withdrawn for encouraging the private investors to make further investment in this sector.

Bibliography

- Ahmed N. 2000. Dairy development in Bangladesh: Prospect and constraint.
- Akbar M.A., Islam M.S., Bhuiya M.S.U., Islam M.R. and Hossain M.A. 2000. Integration of fodder legumes into rice-based cropping systems in Bangladesh: Production of *Lathyrus sativus* and its use as a supplement to straw-based rations of dairy cows. *Asian-Australasian Journal of Animal Sciences* 13:526–528.
- Alam J. 1994. *Economics of mini dairy farm in selected areas of Bangladesh*. Bangladesh Livestock Research Institute, Savar and Dhaka, Bangladesh.
- Alam J. 1995. *Livestock resources in Bangladesh—Present status and future potential*. University Press Ltd, Motijheel CA, Dhaka, Bangladesh.
- BBS (Bangladesh Bureau of Statistics). 1986. Report on Bangladesh livestock survey 1983–84. Bangladesh census of agriculture. BBS, Dhaka, Bangladesh.
- BBS (Bangladesh Bureau of Statistics). 1994. *Statistical Pocket Book of Bangladesh*. BBS, Dhaka, Bangladesh.
- BBS (Bangladesh Bureau of Statistics). 1999. *Structure of agricultural holdings and livestock population census of agriculture 1996*. Volume 2. BBS, Dhaka, Bangladesh.
- DLS (Department of Livestock Services). 1998. Development and activities of livestock. (in Bengali). *Department of Livestock Services—An overview*. DLS, Dhaka, Bangladesh.
- DLS (Department of Livestock Services). 2000. *Department of Livestock Services—An overview*. DLS, Dhaka, Bangladesh.
- Islam M.H., Rahman A.K.M.M., Hashem M.A. and Hossain S.M.I. 1999. Women's participation in dairying. *Bangladesh Journal of Animal Science* 28:1–2.
- Kabir M.H. and Talukder R.K. 1997. Returns from investment in dairying in a selected area of Bangladesh—a comparative financial analysis of local and cross breed dairy farms. *Bangladesh Journal of Agricultural Economics* 20(1):67–84.
- Khan A.A., Ali A., Hussain S.S. and Bhuiyan A.K.F.H. 1999. Reproductive performance of different genetic group of cows under farm condition. *Bangladesh Journal of Animal Science* 1:2.
- Malhotra R. 1997. SAARC dairy grid. In: Gupta P.R. (ed), *Dairy India 1997*. 5th edition. A-25 Priyadarshini Vihar, New Delhi, India.

Miyan H.A. 1996. Towards sustainable development: The national conservation strategy of Bangladesh. Consultancy report on the livestock sector. Ministry of Environment and Forestry, Dhaka, Bangladesh.

Mould F., Saadullah M., Haque M., Davis D., Dolberg F. and Orskov E.R. 1982. Investigation of some of the physiological factors influencing intake and digestion of rice straw by native cattle in Bangladesh. *Tropical Animal Production* 7(3):174–181.

Paul D.C. and Saadullah M. 1991. Role of women in homestead of small farm category in an area of Jessore, Bangladesh. *Livestock Research for Rural Development* 2(3):23–29

Reza A. 1986. Energetic Bangladeshi cattle in their environment: A report. University Grants Commission, Dhaka, Bangladesh.

Saha G.C. and Haque S.A.M.A (2002), Small-scale processing and marketing in Bangladesh including reference to micro-credit facilities (good marketing access)-Milk Vita: A case study, In: Smallholder dairy production and marketing- Opportunities and constraints' edited by D. Rangnekar and W. Thorpe, Proceedings of a South-South workshop held at National Dairy Development Board (NDDB) Anand, India, 13-16 March 2001, pp. 327-241

‘Saadullah M. (2002), Smallholder dairy production and marketing in Bangladesh’, In Smallholder dairy production and marketing- Opportunities and constraints’ edited by D. Rangnekar and W. Thorpe, Proceedings of a South-South workshop held at National Dairy Development Board (NDDB) Anand, India, 13-16 March 2001, pp. 7-21

Saadullah M. 1989. Availability of shrubs and tree fodders for farm animals in Bangladesh. In: Devendra C. (ed), *Proceedings of a workshop on shrubs and tree fodders for farm animals in East and South-East Asia*. IDRC (International Development Research Centre), Singapore.

Saadullah M. 1995. Working animal production and research in Bangladesh with special reference to working cows. International Conference on Increasing Animal Production with Resources (IAPLR), held 27–30 October 1995, Ministry of Agriculture, Zhanjiang, China.

Saadullah M. and Hossain M.M. 2000. Report on the quantification of locally available feed resources and feeding systems of animal in different regions of Bangladesh. Bangladesh Agricultural Research Council, Dhaka, Bangladesh, and Bangladesh Agricultural University, Mymensingh, Bangladesh.

Tareque A.M.M. and Saadullah M. 1988. Feed availability requirements for animals. In: Devendra C. (ed), *Consultation on expanding non-conventional feed resources and fibrous agricultural residues; Strategies for expanded utilization*. IDRC (International Development Research Centre), Singapore.

Yunus M. and Jolis A. 1998. *Banker to the poor*. University Press Ltd, Dhaka, Bangladesh

Milk Vita at a glance

Started in 1952

No. of chilling centre – 12

Milk and milk product processing plant – 2

Daily collection 2,40,000 litres per day

Area of operation in the rural sector is spread over six milk-shed areas (viz. Tangail, Mainikganj, Tekerhat, Srinagar, Rangpur and Baghabarighat) covering about 15 districts with 41 police stations and 925 villages.

Objectives

- Raising subsidiary income of poor, landless and marginal farmers living in relatively remote rural areas of the country by way of purchasing their produced milk at a reasonable price through a guaranteed market under the co-operative fold
- Ensuring the regular supply of safe, hygienic and nutritious milk and milk products to city dwellers at a fair price.

Products:

pasteurised liquid milk, butter, ghee, ice-cream and ice lollies, full cream milk powder, skim milk powder, flavoured milk, sweet curd, cone ice cream, cream and rasa malai (sweetmeats)

Services provided to the farmers:

- guaranteed market for their milk;
- reasonable price for the milk produced;
- free of charge medicare (preventive and curative) for all cattle belonging to co-operative society members, with emergency services for 24 hours/day;
- free of charge vaccination against common epidemic diseases;
- free of charge artificial insemination services with deep-frozen semen for upgrading local breeds;
- fodder extension consultancy services for high yields of raw milk;
- arrangement of *bathan* land (pasture grazing land) from the government on soft terms for grazing cattle belonging to milk co-operative farmers;
- distribution of primarily processed balanced concentrated cattle feed (crude form) on a 'no profit no loss' basis to the member farmers
- arrangement of interest-free loans to the member farmers for cattle purchase;
- investment in rickshaw delivery vans for provision to marketing society members on a hire-purchase basis with easy installments for repayment;
- national and international training for better animal husbandry practices by the farmers;
- imparting knowledge and information through routine display of audio-visual shows regarding improved cattle keeping practices and co-operative management; and
- arrangement of national and international training/study tours for the member farmers in order to acquaint them with up-to-date knowledge of the dairy sectors and cattle rearing.

The direct beneficiaries include:

- 65,000 poor, landless and marginal milk producing farmers into the fold of 565 village milk producers' co-operative societies, who were earlier exploited by the traditional middlemen (*ghoses*), but are presently receiving a fair price for their milk in a guaranteed market
- A large number of city dwellers receiving a continuous supply of pure, safe, hygienic and nutritious milk and milk products at a reasonable price
- More than 500 rickshaw pullers' co-operative members engaged in the distribution process receiving a daily cash income, thus maintaining their livelihoods along with the livelihoods of their dependent family members
- More than 4000 people who are employed in jobs, directly and indirectly created, in milk production and transportation, both in rural and urban areas
- Nearly 750 people engaged in the different plants and head office of the organisation who earn livelihoods for themselves and their families and
- 100 new co-operative farmers every year who receive interest-free credit for cattle purchase.