

Impact of the Private Processors' Competitions on the Dairy Cooperative in Bangladesh

A study on the dairy co-operative Milk Vita and its members in Srinagar in the Munshiganj district

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Abstract: The study identified the impact of private processors' competitions on the net income of Milk Vita in the liberalized market. A simple random sampling technique was used to select 60 dairy farmers at Srinagar in Munshiganj district. The data was collected using structured questionnaire and analyzed by using the descriptive statistical method. The study emphasized the impact of the private processors' competitions on the net income and the raw milk collection of Milk Vita. The private processors developed their raw milk collection strategies against Milk Vita. Milk Vita was rendering free services on treatment, vaccination, artificial insemination, and micro credit with 5% interest. Private processors were rendering micro credit service without interest, with an easy installment system but with a necessity of mortgage to attract Milk Vita's members. Therefore, the share of Milk Vita in raw milk collection decreased for the free rider members who were getting free services from Milk Vita and selling raw milk to private processors at high price. On the contrary, members complained that raw milk collection system of Milk Vita was not convenient who were living in long distance from the collection point. Milk Vita had no consideration for the members who had milk processing techniques. It also found that the legal relationship between Milk Vita and its members was not in written but in oral contract. There was no obligation for the free rider members in the functions of Milk Vita. Therefore, Milk Vita should consider in the raw milk collection system for the members who were living in long distance from the collection point. Milk Vita also should consider leading a joint venture business with the members cum processors and should develop the relationship with its members.

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1. Introduction

The livestock sector has played an important role in the economy of Bangladesh since 1971. The share of the livestock sector in the agricultural gross income increased from 7.6% in 1973 to 12.9% in 1999 and is projected to increase up to 19.9% in 2020. In particular, raw milk production increased from 1.29 million tons in 1988 to 2.27 million tons in 2007. The dairy farmers hold a vital share of their agricultural gross income due to the support of the Bangladesh Milk Producers' Co-operative Union Limited (Milk Vita). Milk Vita ⁽¹⁾ has played a major role in the development of dairy farming since 1973. This organization has ensured that its members not only have access to the marketing of raw milk but also to free services for breeding, such as veterinary treatment, micro credit and technical guidance. As a result of these services, the raw milk productivity of members has gradually increased.

Although the government and Milk Vita worked to develop the dairy farming, the raw milk supply was inadequate to meet domestic demand. Therefore, the government allowed the importation of agricultural products, including milk products, by adopting an agricultural import policy in 1990.

Powdered milk has since been imported to feed the increasing number of growing children and the demands of an increasing population affect imports. The annual per capita milk consumption increased from 16 kg in 1981 to 32 kg in 2005. The consumer's milk price also increased from 25 Taka per liter in 1993 to 35 Taka per liter in 2005 (BSH, 2005). Moreover, Bangladesh became a member of the WTO in 1995, and then, the number of private processors increased to 11 in 2007. As a result, the competitions in the milk market among the processors increased more than ever in the country (Figure 1).

The number of Milk Vita's members gradually increased to 90,000 in 2004 but sharply increased to 160,000 in 2007. However, the net income of Milk Vita decreased from 886,03,000 Taka in 2004 to 412,33,000 Taka in 2007 rather than increased. Moreover, the raw milk collection quantity did not increase as per expectation, oppositely, raw milk collection decreased from 736,26,000 liters in 2006 to 697,62,000 liters in 2007 (Figure 1).

It assumed that the decrease in net income of Milk Vita due to an increase in services cost under the rising of member numbers. It also assumed that the decrease in net income of Milk Vita due to the

decrease in raw milk collection as a new threat to Milk Vita. The decrease in raw milk collection may lead to a decrease in net income, services to the members in the near future. The decrease in services to the members may lead to a decrease in milk production of the dairy farmers.

Therefore, this study focused on the impact of private processors between 1993 to 2007 on the net income and raw milk collection of Milk Vita. This study⁽²⁾ examined the following points in order to

identify the impact of private processors' competition on Milk Vita and considered the development conditions of Milk Vita. (1) the raw distribution structure and Milk Vita's share in the country and the surveyed area, (2) the strategies of private processors directing the members to be a free rider, (3) supply of raw milk from members to Milk Vita and members' characteristics, and (4) the relationship between Milk Vita and its members.

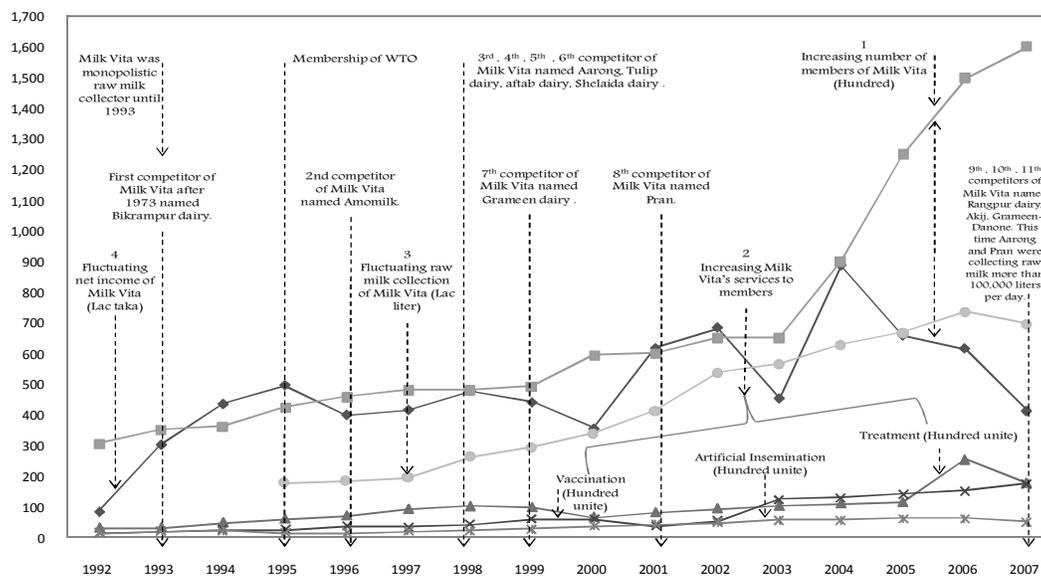


Figure 1: Trends of Milk Vita's raw milk collection, members, income and services to members
Source: The Milk Vita head office, FAO stats, the field survey during February and March 2008

2. Material and methods

2.1 Survey subjects

The dairy cooperative Milk Vita was established with the recommendation of UNDP and FAO in 1973 at Shirajganj in the country. It started as the part of a poverty reduction program and dairy farmers' development by the government. In 2005, the government shifted its share in the capital of Milk Vita from 50% to 98% to serve the dairy farmers and improve their life conditions. Milk Vita has expanded its work to 21 out of the 64 districts in the country. It has 160,000 dairy members, 1,600 primary milk producer societies⁽³⁾ and 24 branch offices with chilling plants. Milk Vita is governed by a managing committee consists of 12 members, of which 8 are elected from the members of primary milk producers' societies and the other 4 members are nominated by the government. The general manager is the chief of the organization assisted by 3 additional general managers, 6 deputy general managers, with other managers and professional executive and employees with total enrollment of more than 1,100.

2.2 Present resources and future plan of Milk Vita

Milk Vita established a condensed milk plant at Baghabarighat, in 2006, UHT (ultra high temperature) treated milk plants at Mirpur in 2006, Powder milk plant at Baghabarighat in 1997, milk pasteurization plant at Mirpur in 1976, Takerhat in 1977, Shirajgonj in 1977, narsingdi in 2006, a poly-film production plant and cow breeding development plants among others. The future plan are to establish a cattle breed development through technology transfer, acquisition of bathan lan from the government for permanent use as grazing land by the milk producer farmers and establishment a cattle feed plant.

2.3 Free services to the members

Milk Vita offers various free services that designed for the benefit of member farmers. These services are as following: (1) preventive and curative medical services for cows, including emergency services; (2) vaccination services against epidemic diseases; (3) artificial insemination services for upgrading local breeds; (4) fodder extension

consultancy services to ensure high yields; (5) extension services with knowledge and information about improved cattle husbandry practices; and (6) arrangement services with study tours to advance the knowledge of cattle rearing.

2.4 Productions and distributions of Milk Vita

To ensure the regular supply of fresh milk and milk products to the city dwellers at a reasonable price was one of the purposes of Milk Vita. Therefore, Milk Vita has been producing liquid packet milk, chocolate, condensed milk, cream, ice cream, rashmalai⁽⁴⁾, sweet less curd, sweet curd, butter, ghee⁽⁴⁾, UHT milk, powder milk etc. All kinds of products were marketing in the capital city Dhaka and others divisional cities through the own distributors of Milk Vita.

2.5 Survey area selection criteria

The survey area of this study was Srinagar in the Munshiganj district of the suburban area of Dhaka. The suburban area of Dhaka was the largest out of 6 major cities. This area has a strong impact on the milk consumption in the capital city Dhaka. This area has been performing the important functions of supplying milk and dairy products. There were 0.93 million dairy farmers, out of a total of 4.75 million farmers (BBS, 2005), producing raw milk. In this area, Srinagar was the largest and most populous area in terms of commercial farm holdings. Competition takes place in Srinagar between Milk Vita and private processors such as the Bikrampur dairy and the sweet shop Ros. The Srinagar branch of Milk Vita was the largest supplier of raw milk to Milk Vita within the suburban area of Dhaka. The Srinagar branch accounted for 5% of the total raw milk supply of Milk Vita until 2007. Raw milk collection by Milk Vita from Srinagar today is decreasing drastically. This drastic reduction occurred in this area despite encouragement by Dhaka, the largest consumption area and an increase in dairy practice. Srinagar was therefore selected as a survey place.

The field survey covered the Srinagar branch of Milk Vita and its 60 members as well as the private processors of the Bikrampur dairy and the sweet shop Ros. Interviewees among the 60 members were randomly selected. The collected data were analyzed by the descriptive statistical methods and comparative way.

3. Results

3.1 The raw milk distribution structure and Milk Vita's share in the country and in the surveyed area

In 2007, 2.27 million tons (MT) of raw milk was produced in Bangladesh and distributed through 2 channels. Firstly (Figure 2), rural consumers were consumed 1.35 MT (59.5%) as liquid milk and milk foods. Secondly, 0.89 MT (39.7%) was consumed as commercial milk by urban consumers and went to them through 4 channels; (a) 76.4% through sweet shops, (b) 8.2% through middleman, (c) 7.5% through private processors, and (d) 7.9% through Milk Vita. The share of Milk Vita in this year was equivalent to 52% of formal raw milk distribution⁽⁵⁾. However, Milk Vita's share in formal raw milk distribution was 60% in 2006 and 74% in 1998 (Haque S M A, 2007). In addition, urban consumers were directly consumed 0.03 MT (0.8%) in 2007. In the survey area, in 2007, 6,000 tons raw milk was produced and distributed through 2 channels. Firstly (Figure 3), rural consumers were consumed 1,618 tons (27%). Secondly, 4,382 tons (73%) was consumed as commercial raw milk by urban consumers and went to them through 4 channels; (a) 27.4% through sweet shops, (b) 22.8% through middleman, (c) 22.8% through private processors, and (d) 27% through Milk Vita. The share of Milk Vita in this year was equivalent to 27% of formal raw milk distribution. However, Milk Vita's share in formal raw milk distribution was 60% in 2006 and 77% in 1998 (Haque S M A, 2007). In Bangladesh, 39.7% of raw milk was consumed by urban consumers and in the survey area, this consumption was 73%. Milk Vita's share in survey area was high at 27% compared with its share countrywide (7.9%); however, this share was decreasing day by day. While Milk Vita's share was 27%, the private processor (Bikrampur, 1993) and the sweet shop (Ros, 2007) received large shares of 22.8% and 27.4% respectively, despite starting their business operations later than Milk Vita. Before the establishment of private processors, Milk Vita received a larger share. In addition, 22.8% of raw milk went to small urban processors through middleman due to the development of communication and transportation facilities. As mentioned above, the raw milk market has become competitive for Milk Vita not only in the survey area but also throughout the country.

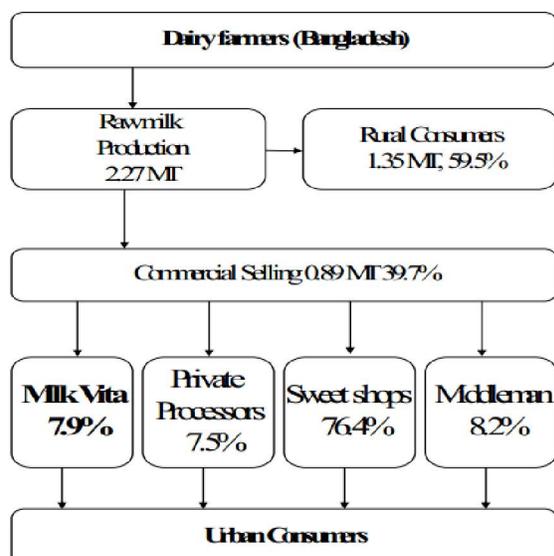


Figure 2: Raw milk distribution in Bangladesh
Sources: Milk Vita, Directorates of livestock sector 2008

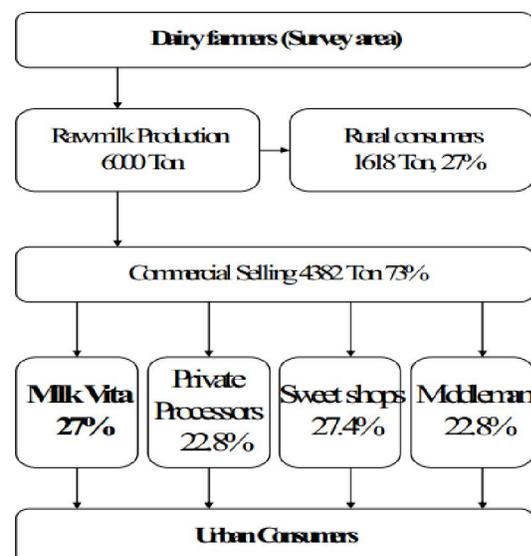


Figure 3: Raw milk distribution in Srinagar
Sources: Milk Vita, Bikrampur dairy processor, Ros, 2008

Table 1: Raw milk collections strategies of milk processors in Bangladesh and Srinagar

Bangladesh			
Particulars	Milk Vita	Private processors	Milk traders
Services	(1) Free treatment, vaccination, artificial insemination (2) Loan with 5% interest (3) No profit no loss based feed supply	(1) n/a (2) Loan without interest with a necessity of mortgage (3) n/a	(1) n/a (2) Loan with or without interest with a necessity of mortgage. (3) n/a
Collection system	From 1,600 society points	From milk market, milk traders, farmers' house	From milk market and farmers' house
Testing	SNF, TSL	Contained water	No test
Pricing	It depends on SNF, low	Bargain, high	Bargain, high
Srinagar			
Particulars	Milk Vita	Private processors	Milk Traders
Services	Free treatment, vaccination, artificial insemination Loan with 5% interest No profit no loss based feed supply	n/a Loan without interest with a necessity of mortgage n/a	n/a Loan without interest with a necessity of mortgage. n/a
Collection system	20 active society points	From milk market, milk traders, farmers' house	From milk market and farmers' house
Testing	SNF, TSL	Water, sometimes no test	No test
Pricing	It depends on SNF, low (19.82 taka per liter)	Bargain, 30 taka per liter	Bargain, 30 taka per liter

Source: The field survey during February-March 2008, Milk Vita office.

Note: 1) The services cost at 12.16 taka per liter of Milk Vita was included doctors' fee, treatment, vaccination, artificial insemination. 2) The management cost for the members was only 15 taka per liter, which was only as feed cost of members. 3) The production cost at 27.16 taka per liter was included doctors' fee, treatment, vaccination, artificial insemination, feed cost and excluded house rent, electricity bill, salary of family labor, transportation cost etc. 4) SNF-Solid Non Fate, 5) TSL-Total Solid, 6) n/a-not available.

3.2 The strategies of private processors directing the members to be a free rider

It was observed throughout the country and within the survey area that 3 raw milk collection strategies have been adopted by milk processors. The processors have developed these strategies to attract dairy farmers with services, raw milk prices and collection systems. As shown in Table 1, some strategy differences between Milk Vita and private

processors were observed. First, Milk Vita freely provided expensive services such as treatment, vaccination, artificial insemination and a supply of no-profit no-loss based feed. In contrast, the private processors did not offer these essential services to dairy farmers to keep cows and calves healthy. Milk Vita also provided a micro credit with 5% interest to its members. The private processors provided micro credit that required a mortgage and was without

interest. Both took payments from the indebted farmers in the form of small charges from the sale of raw milk. Second, Milk Vita set raw milk price at 19.82 taka per liter based on a test standard of 2.5 SNF (Solid non-fat). In contrast, the private processors rarely tested water content and they set raw milk price at 30 Taka or more through bargaining. Third, Milk Vita collected raw milk through its primary milk producers' society in each hamlet. Members carried milk to the society's collection point themselves to sell. In contrast, most of the private processors collected directly from the selected farmers, traders and markets.

On the above discussion, it can be concluded that the private processors adopted the above-mentioned strategies to maximize their profit. They did not offer expensive services to dairy farmers and rarely if ever checked water levels in raw milk. However, they bought a large quantity of raw milk from dairy farmer at a price 30 taka per liter. Oppositely, Milk Vita adopted strategies to develop the members' sustainable farm management practices. Milk Vita emphasized quality checks of collected raw milk to maintain a relationship of mutual trust between Milk Vita and consumers in the domestic market. Milk Vita has supplied consumers with packet milk and milk products that are safe and of high quality.

Milk Vita offered price 19.82 Taka per liter and private processors offered price 30 Taka per liter. If the services cost of Milk Vita at 12.16 taka⁽⁶⁾ per liter add with the offered price of Milk Vita, then the total amount will be 31.98 taka per liter, which is higher than the private processors offered price. Again, the management cost or production cost for the Milk Vita's members was at 15 taka⁽⁷⁾ per liter. By selling the raw milk to private processors at 30 taka per liter, members can make profit (30-15) 15 taka per liter. If Milk Vita stop the services to the free rider members, they have to pay the services cost at 12.16 taka or more per liter to the private doctors. Then, their profit will be (15-12.16) 2.84 taka per liter and this profit is lower than that they get from Milk Vita at (19.82-15) 4.82 taka. Therefore, there were miss-match between Milk Vita and its members. However, Milk Vita took risks of the farming by giving free services to members. Non-members dairy farmers relied on government veterinary services, which were insufficient. Private veterinary doctors were limited and lived in urban areas rather than rural areas. If farmers called, the doctor could not respond quickly

due to distances, the limited number of doctors and limited transportations. Often doctors arrived after the cows have died. Farmers also had to pay fees. The costs of other services provided by private doctors were also very high. So, the strategies of private processors were miss-guiding the members of Milk Vita.

3.3 Supply of raw milk from members to Milk Vita and members' characteristics

Figure 4 shows how raw milk is supplied by members to Milk Vita. The surveyed members (60) were classified into five groups (A1, A2, A3, A4 and A5) based on the raw milk supplied per day by the members to Milk Vita. The members who supplied their raw milk to Milk Vita more than 70 per cent, 50 to 70 per cent, 30 to 50 per cent, 10 to 30 per cent and Not more than 10 per cent of their production were in group A1, A2, A3, A4, and A5 respectively. The characteristics of these groups were analyzed and illustrated in Table 2.

In group A5, the members were selling to private processors and making milk products from 90% of their produced raw milk or 110.66 liters per day averagely. Most of these members had large volume of raw milk productions, 78.2% of them had their own production of milk products and rest of the members were attracted by the private processors who rendered micro credit services without interest. In addition, this grouped farmer was not getting any micro credit services from Milk Vita. Therefore, Milk Vita was losing averagely 2639.71 taka per day only for its free services cost. Most of them were living far places from the collection center of Milk Vita and their family members were on average 8 persons.

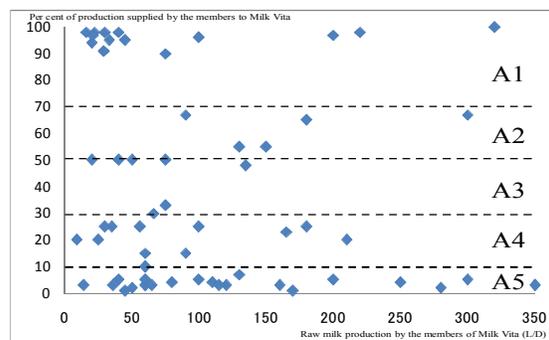


Figure 5: Member's raw milk supply to Milk Vita per day

Source: The field survey during February-March, 2008

Table 2: Some basic characteristics of grouped members of Milk Vita

Particulars/groups	A1	A2	A3	A4	A5	Total
1) Number of farmers	14	9	3	11	23	60
2) Average raw milk production by the grouped farmers (liter per day)	84	115	92	87.27	114.77	0
3) No. of farmers who had more than 60 liter production per day	5	6	3	6	17	37
4) No. of farmers who had 50 to 60 liter production per day	0	1	0	1	1	3
5) No. of farmers who had 40 to 50 liter production per day	2	1	0	0	2	5
6) No. of farmers who had 30 to 40 liter production per day	2	0	0	2	2	6
7) No. of farmers who had 20 to 30 liter production per day	4	1	0	1	0	6
8) No. of farmers who had less than 20 liters production per day	1	0	0	1	1	3
9) Members supplied raw milk quantity on average of grouped farmers (liter per day)	2	46	56	68.23	110.66	64.31
10) Milk Vita was losing income only for the services cost (Taka per day)	1176	1035	276	959.97	2639.71	782.01
11) Members were producing milk products (per cent of grouped farmers)	0	0	0	18.1	78.2%	33.3%
12) Members were getting micro credit from Milk Vita (per cent of grouped farmers)	78.57 %	88.89 %	0	0	0	31.6%
13) Members were experienced in farming more than 30 years	0.14%	22.2%	0	18.1%	82.6%	40%
14) Others agricultural activities	P	n/a	n/a	CFP	CDS	
15) Family members depends on income of the family on average per group (persons)	6	6	7	7	8	6.88
16) Members were living around 1 kilometer (per cent of grouped farmers)	100%	100%	33.3%	18.1%	0	43.3%

In group A4, the members were selling to private processors and making milk products from 90 to 70% of their produced raw milk or 68.23 liters per day averagely. Most of these members also had large production, 18.1% of them had their own production of milk products and rests of them were attracted by the private processors who rendered micro credit services without interest and with an easy installment system. In addition, this grouped farmer was not getting any micro credit from Milk Vita. Therefore, Milk Vita was losing averagely 959.97 taka per day only for its free services cost. Most of them also were living in far places from the collection center of Milk Vita.

In group A3, the members were selling to private processors from 70 to 50% of their produced raw milk or 56 liters per day averagely. All of them had large production but nobody had their own production of milk products. Most of them were newly established commercial farmers who did not get any micro credit services from Milk Vita. Moreover, they did not have others agricultural activities. The number of family members was on average 7 persons. Therefore, Milk Vita was losing averagely 276 taka per day.

In group A2, the members were selling to private processors from 50 to 30% of their produced raw milk or 46 liters per day averagely. Most of them had large production of raw milk. They were living in short distance from the Milk Vita's collection center and had started dairy farming newly. They did not have others agricultural activities by which can make attention to private processors. In addition, 88.89% of these farmers were getting micro credit from Milk Vita for their average milk supply to it. Also, Milk Vita was losing averagely 1035 taka per day.

In group A1, the members were selling to private processors from 30 to 20% of their produced raw milk or 2 liters per day averagely. Most of them had small production of raw milk and landless dairy farmers. They were living in short distance from the Milk Vita's collection center and had started dairy farming newly. They did not have others agricultural activities by which can make attention to private processors. In addition, 78.57% of these farmers were getting micro credit from Milk Vita for their average milk supply to it. Also, Milk Vita was losing averagely 1176 taka per day.

3.4 The relationship between Milk Vita and its members

The survey examined the legal relationship between Milk Vita and its members. As members of Milk Vita, farmers must be a dairy farmers with one or two cows and supply a minimum of either 1 liter of raw milk per day or 100 liters per year. Milk Vita rendered various free services to members, such as free veterinary treatment, vaccinations, artificial insemination, loans with 5% interest, and guidance. All of these services constitute Milk Vita's functions, and its members have the right to access those services. In exchange, Milk Vita has the right to access raw milk produced by the members. Milk Vita had an oral, not written, contract with its members regarding the raw milk supply. In this situation, the members sold only the minimum amount of produced raw milk to Milk Vita to fulfill the requirements for free services and sold most of their production to private processors. It was revealed that there were no obligations for members who supplied raw milk less than the minimum amount of raw milk to Milk Vita. The amount of raw milk supplied to Milk Vita was therefore small.

4. Conclusion and considerations

Most of the dairy farmers in Bangladesh are in small scale in the mixed farming system. They need special care regarding services and reasonable price of raw milk to sustain their farming. Therefore, a special attention needed for Milk Vita that has played an important role by undertaking development programs for dairy farmers and, providing free services and information since its establishment. Recently, it faced the impact of the private processors' competition in the liberalized market that leads the dairy farmers to be a free rider, decrease in raw milk collection and net income. The net income of Milk Vita decreased while membership sharply increased and raw milk collection decreased. This is because, the cost of essential services provided by Milk Vita increased sharply under the increase in members and the market share of private processors had increased. The private processors have developed their strategies in raw milk collection that were making miss-match between Milk Vita and its members. As a result, the members were miss-guided by the private processors and became free rider in the cooperative system which resulting the decrease in raw milk collection and net income of Milk Vita. It was also revealed that most of the members were selling their raw milk to private processors who were giving micro credit without interest, with an easy refunding system, collecting raw milk from members' house. It was also revealed that some of the members were not selling raw milk to Milk Vita for the living in long distance from the collection point of Milk Vita. Some of the members had their own production of milk products and they sell only minimum amount of raw milk to Milk Vita and rests they use to produce their products. It was also revealed that the legal relationship between Milk Vita and its members regarding the raw milk supply requirement was based on an oral contract, not a written contract.

Therefore, the development conditions of Milk Vita and its activities should be considered as the political, economic and competitive environment changes. Milk Vita must consider the following factors in its future development. 1) Milk Vita must think for the reasonable price for the members' raw milk or should inform the purposes of the free services to them. 2) Milk Vita should put in place a simpler micro credit system as well as a refund system so that members can easily take and return micro credit, 3) Milk Vita should develop advanced raw milk collection systems for the members, especially those who live in a long distance from the raw milk collection center, 4) Milk Vita ought to adopt some strategies for those members (Dairy farmers cum processors). Milk Vita can buy members' semi-produced products, add additional value, and sell the

final products in the market under the Milk Vita brand. Milk Vita can create a joint business ventures and develop products through technical guidance. 5) Milk Vita must develop deeper relationships with its members by increasing the raw milk supply requirement, converting the existing oral contract into a written one, and making it mandatory for members to supply a certain amount of milk.

Endnotes

1. Milk Vita: National Nutrients Company set up a dairy plant in 1946 in the Indian subcontinent at Lahirmonhanpur, now in the Sirajganj District. In 1947, following the partition of India, the Eastern Milk Products Company took over through the exchange of properties. In 1952, the Eastern Milk Products Company eventually started marketing milk and dairy products under the brand name Milk Vita in East Pakistan. In 1960, Asto dairy started in Dhaka. In 1971, the Bangladeshi government combined Asto and Eastern into one brand and prompted its addition to the Bangladesh Milk Producer's Co-operative Union Limited (Brand name Milk Vita) in 1973.

2. This study reviewed articles related to the dairy sector of Bangladesh and the cooperative Milk Vita. There were 15 articles written by Bangladeshi authors. These articles were classified as addressing the following 3 issues: (1) technical problems in milk production (Hasanuzzaman, 2002; Alam, 1994); (2) development conditions in dairy management (Haque, 2007; Hossain, 2005; Alam, 1994; Rashid, 2007); a return to dairy farming (Alam, 1999; Kabir, 1997); policy in the dairy sector (Jabbar, 2005); milk marketing channels (Kumar, 2002); and (3) Milk Vita's marketing system and its impact on the incomes of dairy farmers (Alok, 2000; Maharjan, 2002; Ghosh, 2001 and 2004). Article (Hoque, 2010) addressed the impact of imported powdered milk on Milk Vita. Among these points of view, the third issue above was closely related to this study. The articles regarding the third issue discussed Milk Vita's impact on raw milk marketing, the regular income of farmers, the cost of raw milk marketing, and so on. There was no study that discussed the correspondence of Milk Vita under the competitive environment with private processors. This study contained a new point of view regarding the impacts of the marketing strategies of private processors on Milk Vita's raw milk collections.

3. Primary milk producers' society is the rural-level organization of dairy members of Milk Vita. The functions of these organizations are to collect raw milk from dairy members by testing SNF, TSL, and water and so on. Each society is governed by one member who is nominated by dairy farmers and a milk checker who is appointed by Milk Vita.

4. Rasamalai, ghee, ponir and doi are the traditional milk products in Bangladesh.

5. Approximately 60% of the raw milk in Bangladesh that went to the consumers through informal channels. For example, rural sweet makers, doi makers, rural home consumption, contract delivery to neighbors and urban home consumers, and roadside markets were informal channels. Approximately 40% of the raw milk going to consumers, especially urban consumers, was through formal channels. Milk Vita, Bikrampur dairy, Amomilk, Arong, Tulip, Ultra, Aftab, Grameen, Pran, Rangpur dairy, Akij group and Grameen-Danone were formal channels. These were the large-scale raw milk processors in the country. Among the formal channels, Milk Vita had a 100% share from 1973 to 1993.

6. The services cost of Milk Vita was at 12.16 taka per liter including doctors' fee, treatment cost, vaccination cost, artificial insemination cost, calculated based on field survey during February to March, 2008.

7. The production cost or the farm management cost for the Milk Vita members was at 15 taka per liter, calculated based on the feed cost per cow per day and the average productivity of the cow during February to March, 2008.

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