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# Dudhsagar Dairy:

## Excelling through Logistics Practices

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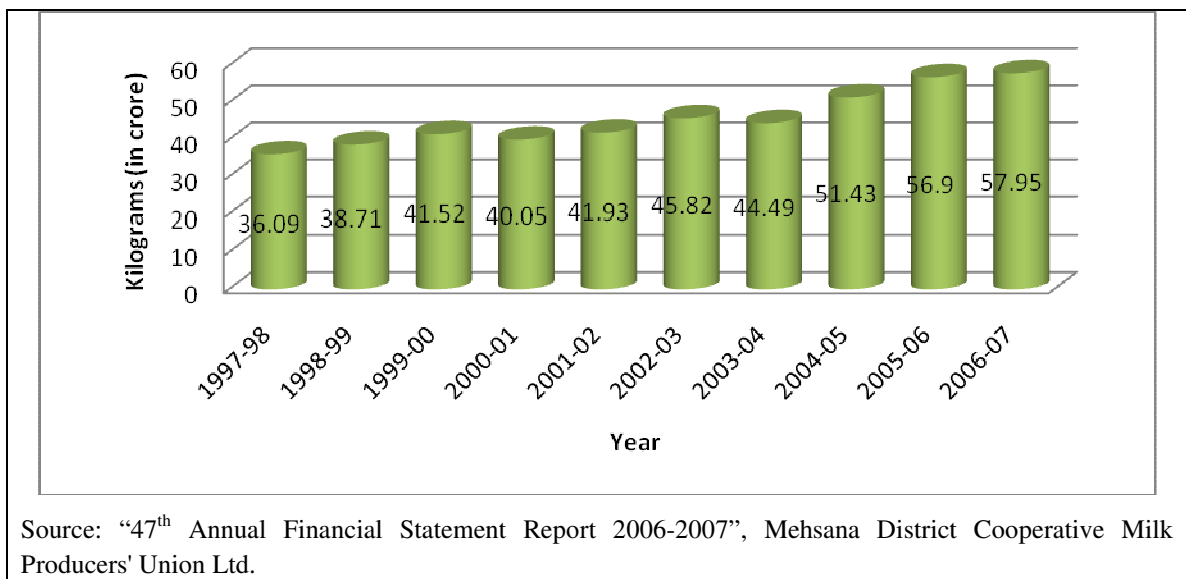
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The Mehsana District Cooperative Milk Producer's Union Ltd. (Dudhsagar Dairy), the largest milk processing unit in India located at Mehsana city in Gujarat, collected over 20 lakh litres milk per day by 2007. The backbone of the collection of this quantum of milk from 920 DCSs (Dairy Cooperative Society at Village Level) scattered over 3 districts was an efficient transportation system. The bridge out the challenges of managing this mammoth inbound & outbound logistics network keeping customer centric approach against the backdrop of emerging competition from private players as also the organizations desire to expand the level of operations in the country.

**Keywords** Dudhsagar Dairy, Milk & Milk Processing, Transportation, Market Leader, Supply Chain

**M**ehsana District Cooperative Milk Producers' Union Ltd (Dudhsagar Dairy), Mehsana (Gujarat) based dairy with 2.3 million kg per day milk production, achieved the growth of approximately 1.84 percent in average milk collection from 2005-06 to 2006-07. In 2006-07, the dairy achieved 579.5 million kilograms annual milk collection (**Exhibit I**) of which buffalo milk had contributed approximately 53 percent and Cow milk had contributed 35 percent (**Annexure I**). The Dairy was the largest milk processing unit in India and undoubtedly market leader in the North Gujarat Region. The dairy collected 2 million litres milk per day backed by efficient transportation system which provided a competitive edge. It was to be seen that how Dudhsagar Dairy would maintain a leading position, despite having negligible potential for further expansion. Industry skeptics wonder how long Dudhsagar Dairy would be able to maintain its momentum through its efficient inbound and outbound logistics and customer centric approach against emerging private players, unintervened?

**Exhibit I: Annual Milk Collection**



## **Dudhsagar Dairy: Its Logistic Practices**

Dudhsagar Dairy, a District Level Dairy Cooperative Union (DCU), was established in 1960. The dairy had been largely involved in milk procurement and processing services, supply of cattle feed, Artificial Insemination (AI) services, veterinary services and selling of milk products like Sagar Ghee. The dairy's all products were marketed by Gujarat Cooperative Milk Marketing Federation (GCMMF), a state-level apex body of milk cooperatives in Gujarat which was India's largest marketing organization. In 1994-95, this DCU collected and processed 25 crore litres of milk which was collected from 920 DCSs (Dairy Cooperative Society at Village Level).

In 2006-07, the number of DCSs which collected milk from farmers (milk producers) reached to 1284. The dairy had one chilling centre at its processing facility at Mehsana city and allocated five chilling centres, one at each Taluka place like Kheralu, Kadi, Harij, Hansapur, and Vihar based on load (average 200 DCSs). These DCSs were responsible for making milk available for processing at the main plant. From villages, milk was transported to dairy or chilling centre. In case, DCS had Bulk Milk Cooler (BMU), milk was transported via tanker to dairy or chilling centre. In case, DCS did not have BMU then milk was transported via cans in trucks like mini trucks (max. capacity 80 cans), medium trucks (max. capacity 120 cans) and heavy trucks (max. capacity 180-200 cans).

The dairy had 71 Bulk Milk Coolers (BMU) in North Gujarat Region. The dairy had identified 140 routes based on load bearing capacity of truck and the distance transported. This dairy used the contract system to collect the milk from DCS to DCU and from chilling centre to DCU to cope up the time schedule which was set by dairy in the accordance with milching habits of farmers. Veterinary experts recommended that the gap between two successive milching was 11 hours to 12 hours. The dairy had fixed time gap of four hours within which milk should be reached to dairy after milching. The Van/Truck/Tanker of contractor should reach within  $\pm 15$  minutes of time decided at dairy dockyard. Contractors were responsible for delivering milk from DCS to dairy. If

they failed to supply in time, the milk became sour and they remained responsible for the respective financial losses (**Exhibit II**). In case, contractor was in time in delivering the milk to dairy, though milk got sour, then DCS remained responsible for the respective financial losses. The dairy had approximately 240 grams sour milk per 100 litres of milk collected, which meant operations were well maintained.

To minimise the supply side deficiency for collection of milk, the dairy used the contract system. The dairy managed 70 percent contracts and relied on DCSs for remaining 30 percent contracts. The dairy release the tenders notice for 70 percent of contracts in Newspapers and used to select the lowest price quote. The dairy followed negotiation method for remaining 30 percent of contracts which were given to DCS. DCS usually earned approximately Rs. 70,000 in a year through such contracts. The DCS participation had started before 15 months where in the dairy did not ask for any tenders from DCS for proceedings, this led the dairy in strengthening the supply chain (**Exhibit III**).

#### **Exhibit II: Rate**

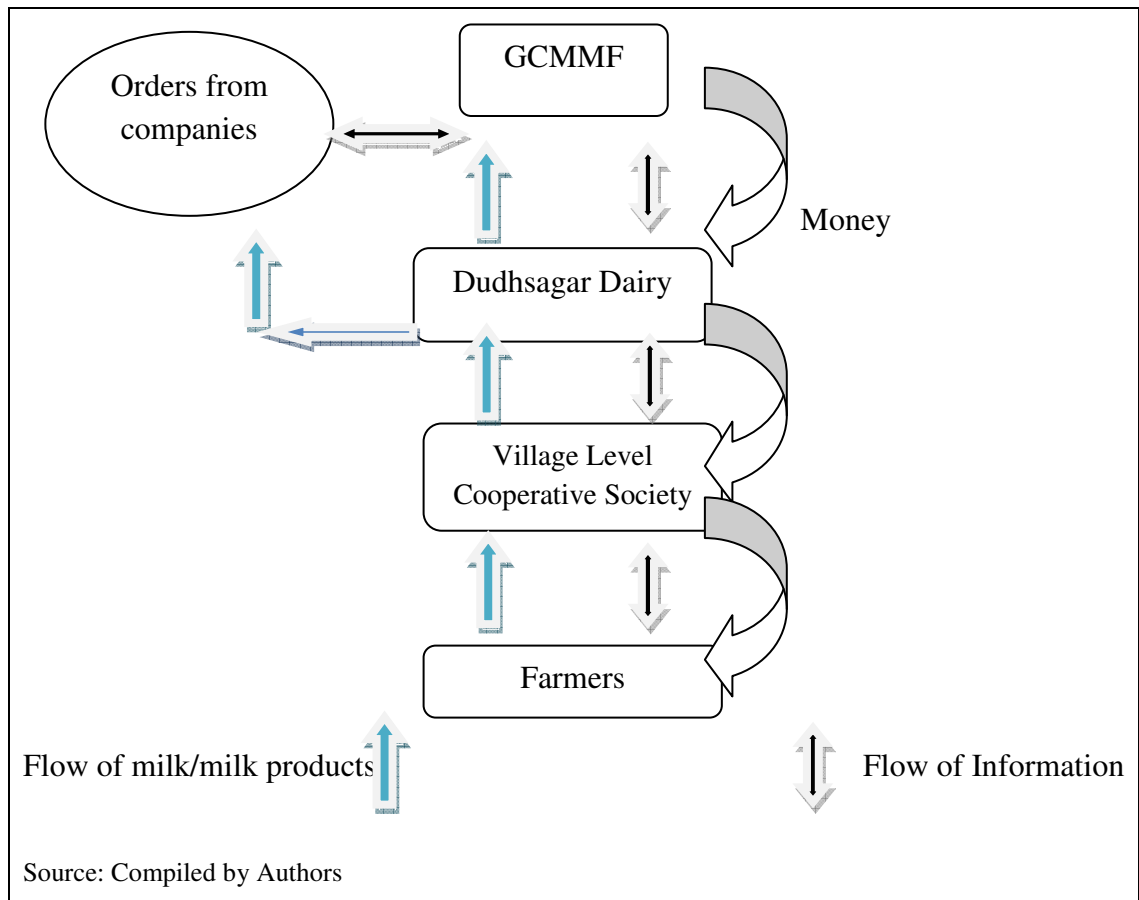
| <b>Rate of milk per kilo fat</b> |                       |                           |                                |                        |                     |
|----------------------------------|-----------------------|---------------------------|--------------------------------|------------------------|---------------------|
| <b>Type of milk</b>              | <b>Fat Percentage</b> | <b>S.N. F. Percentage</b> | <b>Good Quality Milk (Rs.)</b> | <b>Sour Milk (Rs.)</b> | <b>Yogurt (Rs.)</b> |
| Milk<br>(Buffalo)                | 5.5 and above         | 9.0 and above             | 270.00                         | 202.50                 | 135.00              |
|                                  | 5.1 to 5.4            | 9.0 and above             | 267.30                         | 202.50                 | 135.00              |
| Milk<br>(Cow)                    | 3.5 and above         | 8.5 and above             | 129.13                         | 96.85                  | 64.57               |
|                                  | 3.0 to 3.4            | 8.5 and above             | 122.67                         | 96.85                  | 64.57               |

Lower quality of good milk, sour milk and yogurt compare to above standard are subject to 25% of the rate.  
Above listed rates are provisional and proceed after April 1, 2008  
Source: “47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd.

Tenders were called for each route on annual basis and prices were filled on daily basis. If the distance was less, the average cost to dairy was more as trucks were occupied for the full day, full year. Tenders were selected based on least cost. By 2006-07, Dudhsagar Dairy had 73 field staff who were responsible for supervision. They closely examined the

accounting, route checking, and also handled the problems faced by DCSs through inspection. The dairy arranged inspection to various DCSs once in three months for proper functioning. Field staffs were called twice in a month for a meeting. Dudhsagar dairy had appointed one supervisor for 20-25 DCSs to supervise their operations.

**Exhibit III: Supply Chain (Milk flow and Information flow)**



These DCSs generally paid to the farmers accordingly to the fat percentage in milk (**Annexure II**) and the S.N.F. (Solid Not Fat) percentage level (**Exhibit II**). The rates were fixed by the Dudhsagar dairy based on the market demand of milk and milk products. The dairy paid money to DCSs. These DCSs paid money to farmers three times in a month in a cycle of 1-10, 11-20, 21-last day of the month with a view of smooth cash inflow to the farmers. Furthermore, farmers had reliance on income from agriculture which was varied as seasonal changes. All DCSs earned Rs. 2 per Rs. 100 given by dairy as a commission. In 2006-07, Dudhsagar Dairy revised this price table 11 times. In same

period, the rate of milk per kilo fat with fat percent 5.5 and above had a price ranging from Rs. 240 to Rs. 310. The rates as on April 1, 2008 were Rs. 270 for the same quality of milk (**Annexure III**).

In 2006-07, the revenue of milk and milk processing products grew at 19.35% from Rs. 1062 crore in 2005-06 to Rs. 1135 crore and 18% in cattle feed from Rs. 131 crore compared to previous year (**Annexure IV**). In the year 2006-2007, farmers received 38 payments through installments including 36 normal payment installments (three payments in each month) and two more additional payment installments. The dairy and DCS distributed its profit to milk producers yearly as one payment installment. In the year 2006-07, the dairy distributed Rs. 99 crore to milk producers. Being a Cooperative union, the dairy passed on 79% of its profit to farmers. They earned (**Annexure V**) in line with their milk-producer driven approach. Further, the dairy distributed 3 percent of its income on 1400 employees and 9 percent on services.

To bring efficiency and effectiveness in milk collection and logistics, Dudhsagar dairy had provided 77 computers, 74 printers, 69 automatic milk collection (A.M.C.) software to DCS. At Dudhsagar dairy, the transportation system was balanced by one's gain-other's loss. If transporters were late then the loss was more than the operational expenses incurred in getting the system on right track, so they immediately were being forced to put a new vehicle which brought a great discipline to tackle the unseen issues in this existing transportation system.

## **Challenges Ahead**

Having high operating cost structure; DCS incurred a huge operating cost in cooling of milk. The Dudhsagar dairy gave cooling charge of 120 paise per 1 litre of milk to the DCSs which were located in rural areas and faced frequent power (electricity) cut problems. So, in case of power cut, DCS had to make a telephone call to dairy which led to an immediate arrangement of vehicle to unload the milk coolers. To eliminate these problems, Dudhsagar dairy had negotiated with local electricity board and convinced

them not to cut power in the morning and evening time when DCS normally collected milk from farmers.

Moreover, 10 years back, Dairy used to receive 700 grams to 720 grams sourness in milk per 100 litres of milk. Dudhsagar dairy examined thoroughly and found DCSs and farmers responsible for that, and not the contractors. Farmers kept the unsold milk in the refrigerator and sold to DCS on next day, and this was the main reason for the sourness in the milk. So, dairy started to cut down the payments to the DCS which in turn started to identify the farmers who were responsible for such practices. Thereafter DCS started to cross examine the samples that they collected and the farmer had to write apology letter if he had done it first time, and if found guilty a second time, farmer had to incur a loss of that milk. This move had really helped the dairy to bring down this sourness in milk to 210 grams per 100 litres.

In case of natural calamities like flood, earthquake etc, dairy incurred the losses if the issues were found genuine in cross examination undergone by Dudhsagar dairy. Moreover, dairy faced problem of inadequate number of cans due to interchange of loads. So dairy communicated with the concerned DCS and made the changes needed in the loads.

Dudhsagar dairy's all chilling centres were fully utilised. Looking at the increasing rate of milk collection, Dudhsagar dairy started establishing the milk coolers near to the DCS which had higher load. This resulted into reduction in overdependence on chilling centres and greatly reduced the loading and unloading time as well, which ultimately resulted in reducing the total cycle time. To overcome complexities involved in payment to such a huge number of farmers, the dairy signed a MOU (Memorandum of Understanding) with SBI bank in which they opened up the account of farmers and the DCSs and paid directly to the accounts, this led to smooth transactions.

In the region, several cooperative societies stopped milk production due to lack of infrastructure facility. In this regard, Dudhsagar started to revive these closed societies by

providing training and development; veterinary helps in reducing number of ill-animals, financial help to develop transportation facilities to increase the milk collection.

Moreover, Dudhsagar dairy faced a problem in collecting the milk in the areas which were closed to cities as farmers in this area sold milk directly to private dairies, considered as the emerging threat from the private players. The average milk collection per day was 1.588 million kilograms (**Annexure VI**). With this, the dairy also found high illness rate among animals which ultimately resulted into lower milk production yield. The dairy also witnessed the increasing rate of literacy, which affected the migration of rural people to the urban areas. These led to decreased preference towards animal husbandry in some parts.

However, the dairy continues to take initiatives to maintain the current status of market leader in North Gujarat Region. Despite the above challenges it needs to be seen how Dudhsagar dairy would defend its share against private players, if a bigger player particularly Multinational Corporation (MNC) comes with technological and logistics expertise.

## **Discussion Questions**

1. “Effective & efficient management of in-bound transportation is key to dairy’s success”. Comment.
2. Critically analyse the logistics management practices followed by the dairy in context of dairy.
3. Analyse the major challenges faced by the Dairy.
4. Suggest appropriate ways through which the Dairy can reduce the quantity of sour milk received.

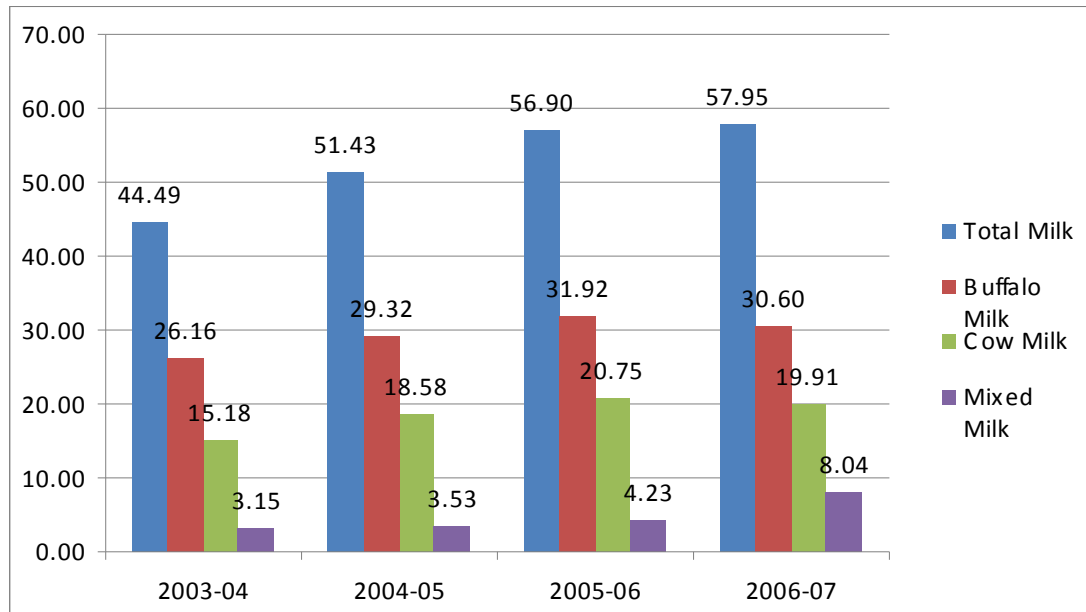
### **Note:**

1 lakh = 100 thousands

1 crore = 10 million



**Annexure I  
Milk Collection: Buffalo, Cow and Mixed**



Source: "47<sup>th</sup> Annual Financial Statement Report 2006-2007", Mehsana District Cooperative Milk Producers' Union Ltd.

**Annexure II**

**Date 01-04-2008 value  
Fat Percentage**

| Liter      | 5.1   | 5.2   | 5.3   | 5.4   | 5.5   | 5.6   | 5.7   | 5.8   | 5.9   |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>0.1</b> | 1.36  | 1.39  | 1.42  | 1.44  | 1.48  | 1.51  | 1.54  | 1.57  | 1.59  |
| <b>0.2</b> | 2.76  | 2.78  | 2.83  | 2.89  | 2.97  | 3.02  | 3.08  | 3.13  | 3.18  |
| <b>0.3</b> | 4.09  | 4.17  | 4.25  | 4.33  | 4.45  | 4.53  | 4.62  | 4.17  | 4.78  |
| <b>0.4</b> | 5.45  | 5.56  | 5.66  | 5.77  | 5.94  | 6.05  | 6.15  | 6.26  | 6.37  |
| <b>0.5</b> | 6.81  | 6.95  | 7.08  | 7.21  | 7.42  | 7.56  | 7.69  | 7.83  | 7.96  |
| <b>0.6</b> | 8.18  | 8.34  | 8.50  | 8.66  | 8.91  | 9.07  | 9.23  | 9.39  | 9.55  |
| <b>0.7</b> | 9.54  | 9.73  | 9.91  | 10.10 | 10.39 | 10.58 | 10.77 | 10.96 | 11.15 |
| <b>0.8</b> | 10.90 | 11.12 | 11.33 | 11.54 | 11.88 | 12.09 | 12.31 | 12.52 | 12.74 |
| <b>0.9</b> | 12.26 | 12.50 | 12.75 | 12.99 | 13.36 | 13.68 | 13.85 | 14.09 | 14.33 |
| <b>1.0</b> | 13.63 | 13.89 | 14.16 | 14.43 | 14.84 | 15.11 | 15.38 | 15.65 | 15.92 |
| <b>2.0</b> | 27.25 | 27.79 | 28.32 | 28.86 | 29.69 | 30.23 | 30.77 | 31.31 | 31.85 |
| <b>3.0</b> | 40.88 | 41.68 | 42.48 | 43.29 | 44.53 | 45.34 | 46.15 | 46.96 | 47.77 |
| <b>4.0</b> | 54.51 | 55.58 | 56.64 | 57.71 | 59.38 | 60.46 | 61.54 | 62.61 | 63.69 |
| <b>5.0</b> | 68.13 | 69.47 | 70.81 | 72.14 | 74.22 | 75.57 | 76.92 | 78.27 | 79.62 |

**Fat Percentage**

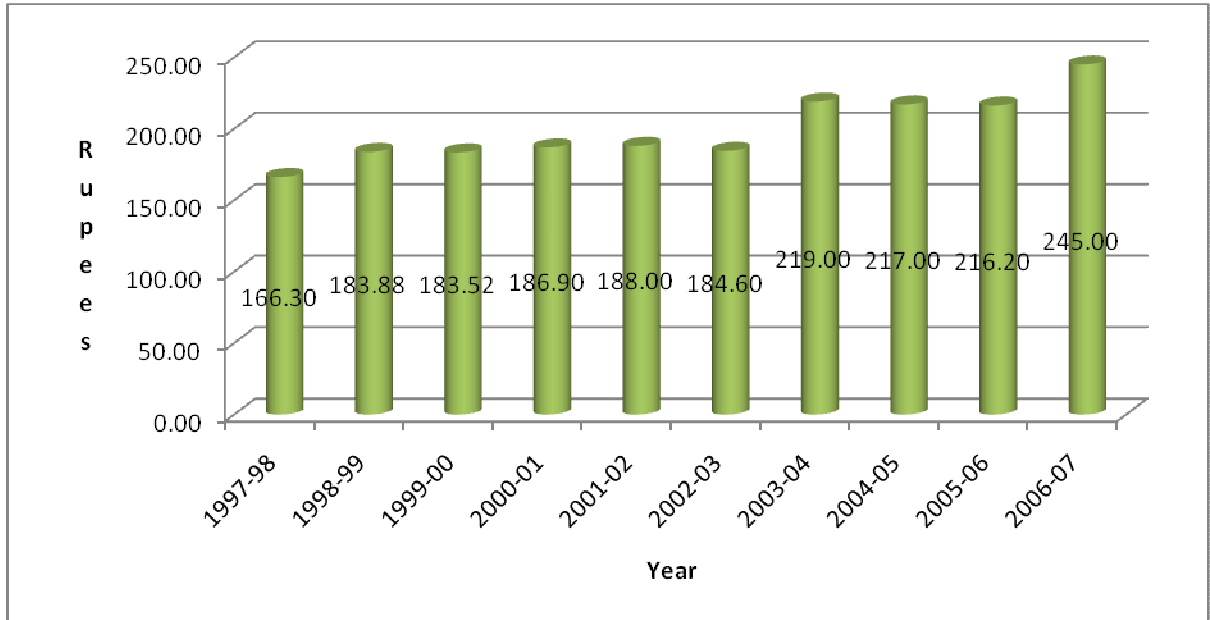
| <b>Liter</b> | <b>6</b> | <b>6.1</b> | <b>6.2</b> | <b>6.3</b> | <b>6.4</b> | <b>6.5</b> | <b>6.6</b> | <b>6.7</b> | <b>6.8</b> | <b>6.9</b> |
|--------------|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>0.1</b>   | 1.62     | 1.65       | 1.67       | 1.70       | 1.73       | 1.75       | 1.78       | 1.81       | 1.84       | 1.86       |
| <b>0.2</b>   | 3.24     | 3.29       | 3.35       | 3.40       | 3.45       | 3.51       | 3.56       | 3.62       | 3.69       | 3.72       |
| <b>0.3</b>   | 4.86     | 4.94       | 5.02       | 5.10       | 5.18       | 5.26       | 5.34       | 5.42       | 5.51       | 5.59       |
| <b>0.4</b>   | 6.48     | 6.59       | 6.69       | 6.80       | 6.91       | 7.02       | 7.13       | 7.23       | 7.34       | 7.45       |
| <b>0.5</b>   | 8.10     | 8.23       | 8.37       | 8.50       | 8.64       | 8.77       | 8.91       | 9.04       | 9.18       | 9.31       |
| <b>0.6</b>   | 9.72     | 9.88       | 10.04      | 10.20      | 10.36      | 10.53      | 10.69      | 10.85      | 11.01      | 11.17      |
| <b>0.7</b>   | 11.34    | 11.52      | 11.71      | 11.90      | 12.09      | 12.28      | 12.47      | 12.66      | 12.85      | 13.04      |
| <b>0.8</b>   | 12.95    | 13.17      | 13.39      | 13.60      | 13.82      | 14.03      | 14.25      | 14.47      | 14.68      | 14.90      |
| <b>0.9</b>   | 14.57    | 14.82      | 15.06      | 15.30      | 15.55      | 15.79      | 16.03      | 16.27      | 16.52      | 16.76      |
| <b>1.0</b>   | 16.19    | 16.46      | 16.03      | 17.00      | 17.27      | 17.54      | 17.81      | 18.08      | 18.35      | 18.62      |
| <b>2.0</b>   | 32.39    | 32.93      | 33.47      | 34.01      | 34.55      | 35.09      | 35.63      | 36.17      | 36.71      | 37.25      |
| <b>3.0</b>   | 48.58    | 49.39      | 50.20      | 51.01      | 51.82      | 52.63      | 53.44      | 54.25      | 55.06      | 55.87      |
| <b>4.0</b>   | 64.77    | 65.85      | 66.93      | 68.01      | 69.09      | 70.17      | 71.25      | 72.33      | 73.41      | 74.49      |
| <b>5.0</b>   | 80.97    | 82.32      | 83.67      | 85.02      | 86.37      | 87.71      | 89.06      | 90.41      | 91.76      | 93.11      |

**Fat Percentage**

| <b>Liter</b> | <b>7</b> | <b>7.1</b> | <b>7.2</b> | <b>7.3</b> | <b>7.4</b> | <b>7.5</b> | <b>7.6</b> | <b>7.7</b> | <b>7.8</b> | <b>7.9</b> |
|--------------|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>0.1</b>   | 1.89     | 1.92       | 1.94       | 1.97       | 2          | 2.02       | 2.05       | 2.08       | 2.11       | 2.13       |
| <b>0.2</b>   | 3.78     | 3.83       | 3.89       | 3.94       | 3.99       | 4.05       | 4.1        | 4.16       | 4.21       | 4.26       |
| <b>0.3</b>   | 5.67     | 5.75       | 5.83       | 5.91       | 5.99       | 6.07       | 6.15       | 6.23       | 6.32       | 6.4        |
| <b>0.4</b>   | 7.56     | 7.66       | 7.77       | 7.88       | 7.99       | 8.1        | 8.2        | 8.31       | 8.42       | 8.53       |
| <b>0.5</b>   | 9.45     | 9.58       | 9.72       | 9.85       | 9.99       | 10.12      | 10.26      | 10.39      | 10.53      | 10.66      |
| <b>0.6</b>   | 11.34    | 11.5       | 11.66      | 11.82      | 11.98      | 12.15      | 12.31      | 12.47      | 12.63      | 12.79      |
| <b>0.7</b>   | 13.22    | 13.41      | 13.6       | 13.79      | 13.98      | 14.17      | 14.36      | 14.55      | 14.74      | 14.93      |
| <b>0.8</b>   | 15.11    | 15.33      | 15.55      | 15.76      | 15.98      | 16.19      | 16.41      | 16.63      | 16.84      | 17.06      |
| <b>0.9</b>   | 17       | 17.25      | 17.49      | 17.73      | 17.97      | 18.22      | 18.46      | 18.7       | 18.95      | 19.19      |
| <b>1.0</b>   | 18.89    | 19.16      | 19.43      | 19.7       | 19.97      | 20.24      | 20.51      | 20.78      | 21.05      | 21.32      |
| <b>2.0</b>   | 37.78    | 38.32      | 38.86      | 39.4       | 39.94      | 40.48      | 41.02      | 41.56      | 42.1       | 42.64      |
| <b>3.0</b>   | 56.68    | 57.49      | 58.3       | 59.11      | 59.92      | 60.73      | 61.54      | 62.35      | 63.15      | 63.96      |
| <b>4.0</b>   | 75.57    | 76.65      | 77.73      | 78.81      | 79.89      | 80.97      | 82.05      | 93.13      | 84.21      | 85.29      |
| <b>5.0</b>   | 94.46    | 95.81      | 97.16      | 98.51      | 99.86      | 101.21     | 102.56     | 103.91     | 105.26     | 106.6      |

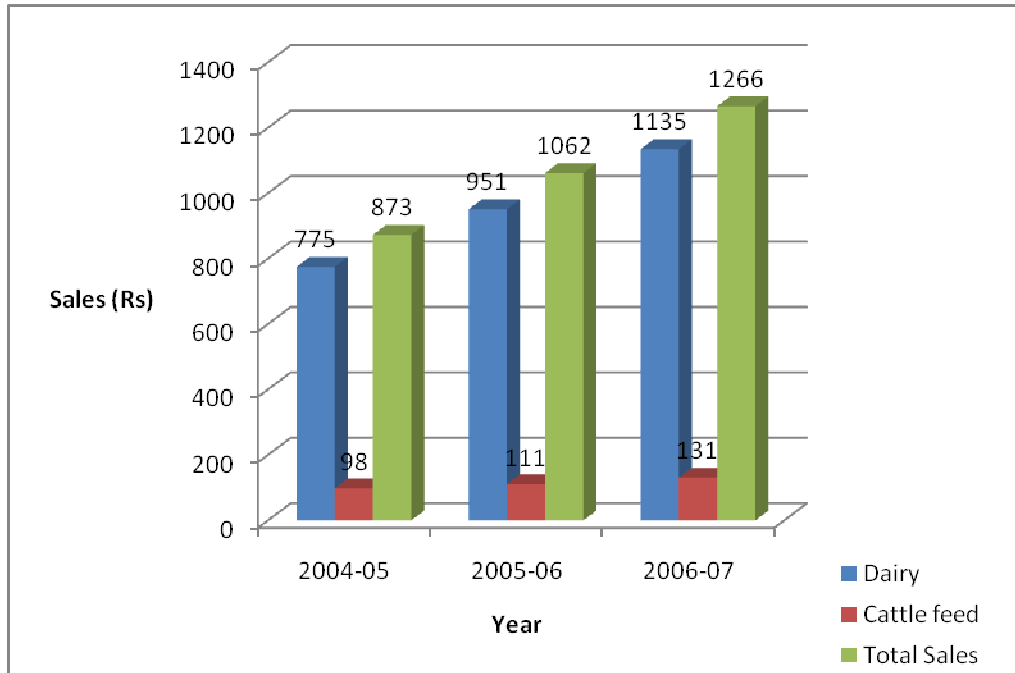
Source: 47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd

### Annexure III: Purchase price of 1 kilo fat milk



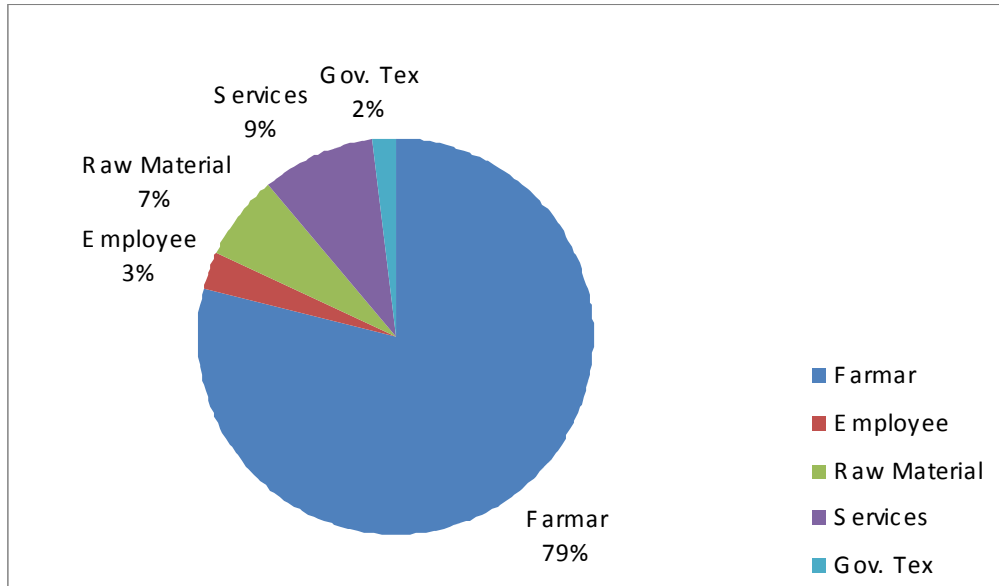
Source: 47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd.

### Annexure IV: Sales (in crore rupees)



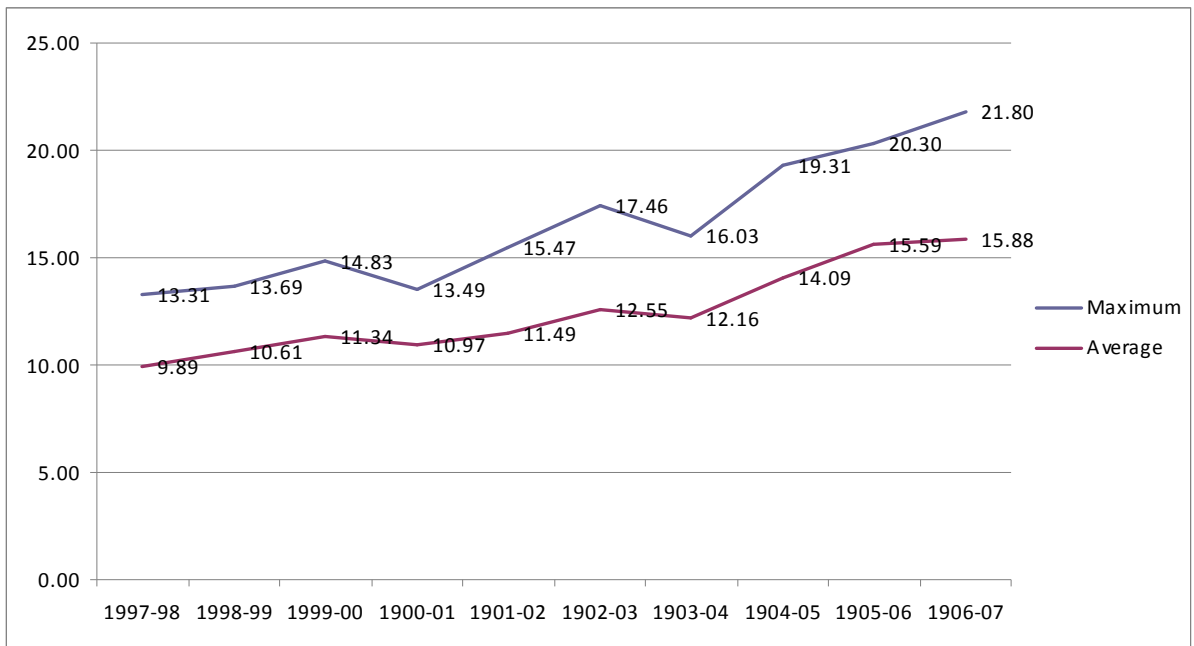
Source: 47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd.

**Annexure V: Distribution of income of Rs. 1 (2006-07)**



Source: 47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd.

**Annexure VI: Average and Maximum Daily Milk Collection (From 1997-98 to 2006-07)**



Source: “47<sup>th</sup> Annual Financial Statement Report 2006-2007”, Mehsana District Cooperative Milk Producers' Union Ltd.