

# Operational Performance of Milk Processing Industry: A Comparative Analysis of Gujarat and Punjab

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**Abstract:** The milk processing industry is a sunrise sector that has maintained a high growth profile in recent years. It has grown enormously and gained prominence over time. The highest share of the processed food is in the dairy sector, where 35 per cent of total produce is processed, of which just 15 per cent is processed by the organized sector. Enhancing disposable income, increasing urbanisation, development of organised food retail and changing consumption patterns have been the major key drivers in the growth of this industry in India. Keeping these views into consideration, our study aims at analysing and comparing the growth and performance of milk processing industry in the states of Gujarat and Punjab and examining the operational performance of GCMMF and MILKFED. The results emanating from our study indicate that the performance of Gujarat in the milk processing sector is far satisfactory than Punjab. Even if we look at the functioning of the cooperative federations operating in both the states, GCMMF outperforms MILKFED.

**Keywords:** Milk Processing Industry, GCMMF and MILKFED.

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## 1. INTRODUCTION

The Milk Processing sector in India has maintained a high growth profile over time due to the changes in the lifestyles, food habits and tastes of the consumers which has led to an increased demand for processed milk products. India, being the largest producer of milk in the world, there is a higher scope of the milk processing sector in the nation. The development of this sector can be seen as a way to enhance farm income and to deal with the problems of poverty and unemployment (Kumar and Prabhakar, 2013). Additionally, it also has better growth prospects and has potential for higher returns. This industry seems to be the key driver in country's growth in the near future. It has grown enormously and gained prominence over time. The highest share of the processed food is in the dairy sector, where 35 per cent of total produce is processed, of which just 15 per cent is processed by the organized sector. About one-fifth of the milk produced is collected and processed by the organized dairy sector (Rais et al., 2013). The dairy sector has experienced a transition from small- scale creameries to large processing plants. It started the innovative practices of product development, organised retailing and proper supply chain management which have made this sector more consumer-oriented. Liberalisation and Globalisation have made the Indian market more captivating for the international players. The dairy processing sector is small as compared to the amount of milk production in the nation (Karmakar, 2006). There is vast untapped potential of the dairy sector which is attracting huge amount of investments from the global players in its processing sector. This sector is now recognised as a priority sector in the new manufacturing policy of 2011 (GOI, 2013). It is paving towards a professionally managed industry.

With these considerations in mind, the present study has been undertaken to analyse the issues pertaining to the development of milk processing sector. Gujarat and Punjab are among the top five milk producing states in the nation. Punjab has a rich agricultural base and excels with the highest per capita milk availability of 961 gms per day (GOI,

2014). On the other hand, Gujarat is flooded with large number of milk co-operatives. Owing to such reasons, we have taken these two states for comparative analysis of the growth and performance of milk processing sector in the two respective states.

Cooperatives are the key players in the organised dairy market which deals with the procurement and marketing of milk and aims at providing better prices to the milk producers. The major cooperatives operating in Gujarat and Punjab are Gujarat Cooperative Milk Marketing Federation (GCMMF) and The Punjab State Cooperative Milk Producers' Federation (MILKFED). In addition to performance of milk processing sector in the states of Gujarat and Punjab, the present study also analyses the performance of the major cooperatives (GCMMF and MILKFED) operating in the states.

## 2. OBJECTIVES OF THE STUDY

The main objectives of the study are as follows:

- i) To analyse and compare the growth and performance of milk processing industry in the states of Gujarat and Punjab.
- ii) To compare the operational performance of GCMMF and MILKFED.

## 3. DATA AND METHODOLOGY

The generation of relevant and appropriate data plays a vital role in undertaking a thorough study. To analyse and compare the performance of milk processing industry in the states of Gujarat and Punjab, the extensive information of manufacturing of dairy products in both the states is collected from the Annual Survey of Industries (ASI) which is published by the Central Statistical Organisation, New Delhi. The ASI data at the state level is available at two and three digit level of industrial classification. The data analysis in our present study is based on the information available at the three digit national information centre 2008 classification for the period 2008 to 2013. The annual reports of GCMMF and MILKFED have helped us in providing the data relating to the number of functional societies, its membership, average daily milk procurement and sales turnover during 2007-12.

The collected data is analysed and presented in tables which is further represented through graphs. Various statistical techniques have been used in the study which are as follows:

**i) Compound annual growth rate :** The compound annual growth rates (CAGR) of milk plants and chilling centres in Gujarat and Punjab have been calculated by using the following formula:

$$\text{CAGR} = \left[ \left( \frac{V_t}{V_o} \right)^{1/n} - 1 \right]$$

where,

CAGR = Compound Annual Growth Rate

$V_t$  = End value of a particular variable

$V_o$  = Start value of that particular variable

$n$  = number of years between the initial and the end time period.

**ii) Productivity :** The comparative strength of the milk processing industry in Gujarat and Punjab is examined by computing the capital productivity ratio, total factor productivity ratio, profit per capital and gross and net value added per capital in Gujarat and Punjab.

There are generally two measures of the productivity, namely, the Partial Factor Productivity (PFP) and Total Factor Productivity (TFP).

**a) Partial factor productivity** is calculated by dividing the total output by the quantity of an input i.e. it is measured in the context of individual resources. In the present study, we have calculated the capital productivity ratio by using the following formula-

$$\text{Capital Productivity Ratio} = \frac{\text{Total Output}}{\text{Invested Capital}}$$

**b) Total factor productivity** is measured in the domain of all the resources taken together. It measures the collaborative impact of all the inputs on the output. High level of TFP implies higher production efficiency i.e. both labour and capital can earn huge sufficient returns. Favourable circumstances like improvement in the technology, quality of labour and creation of conducive industrial environment augment the TFP which indicates long-term increase in output.

$$\text{Total Factor Productivity} = \frac{\text{Total Output}}{\text{Total Inputs}}$$

**(iii) Profitability:** We have calculated profitability as profit per unit of invested capital. Profit is the excess of net income over the cost of employees' compensation i.e. total emoluments, contribution to provident fund and other staff welfare expenses. On the other hand, Invested capital is the sum of fixed capital and physical working capital.

$$\text{Profit per capital} = \frac{\text{Profit}}{\text{Invested Capital}} * 100$$

**(iv) Gross and net value added per capital:** Both gross value added and net value added are a measure of industrial performance. Net value added tends to capture the capacity of an industry to generate wealth by adding value to the material inputs. We calculated Gross Value Added and Net Value Added per invested capital to analyse the performance of milk processing industry in Gujarat and Punjab.

$$\text{Gross Value Added per capital} = \frac{\text{Gross value added}}{\text{Invested capital}}$$

$$\text{Net Value Added per capital} = \frac{\text{Net value added}}{\text{Invested capital}}$$

**(v) Standard deviation :** The amount of dispersion from the mean is measured by the standard deviation technique which is the square root of its variance. We calculated the standard deviation of the total factor productivity in both the states using the following formula.

$$\text{Standard Deviation} = \sqrt{1/N \sum (xi - \mu)^2}$$

where,

$x_i$  = each value in the population

$\mu$  = the mean of the values

N = the total number of values

## 4. EMPIRICAL FINDINGS

### 4.1 Milk plants and chilling centres in Gujarat and Punjab:

We compared the growth of milk plants and chilling centres operating in Gujarat and Punjab during 1990-95 to 2010-13 and the results are presented in table 1.1. The growth of capacity of the milk plants and chilling centres of Punjab was satisfactory during 1990-00 as compared to Gujarat where the growth rate in the chilling capacity was on an average just 2.3 per cent per annum as against 9.55 per cent per annum in Punjab during the same decade. On the other hand, the growth in the number of chilling centres was negative in both the states in 1990s but still the scenario was better in Punjab particularly in the late nineties. Thereafter, Gujarat had recorded better growth rates in the number and capacity of chilling centres during 2010-2013 as compared to Punjab. The state registered as high as 7.6 per cent per annum growth in the number of chilling centres during 2010-13 as against Punjab recorded a negative growth rate of -1.8 per cent per annum in the same period.

**Table 1.1: Compound annual growth rates of milk plants and chilling centres in Gujarat and Punjab (Percent per annum)**

| Year    | Gujarat                       |                 | Punjab                        |                 |
|---------|-------------------------------|-----------------|-------------------------------|-----------------|
|         | Capacity (000 litres per day) | Chilling Centre | Capacity (000 litres per day) | Chilling Centre |
| 1990-95 | 4.6                           | -1.6            | 10.5                          | -3.6            |
| 1995-00 | 0                             | -3.9            | 8.6                           | 0.5             |
| 2000-05 | 4.5                           | 6.5             | 1.2                           | 3.1             |
| 2005-10 | 10.6                          | 0.8             | 2.5                           | -0.4            |
| 2010-13 | 5.4                           | 7.6             | 0.5                           | -1.8            |

Source: i) GOG (Various Years), Statistical Abstract of Gujarat (Various Issues), Gandhinagar, Directorate of Economics & Statistics, Government of Gujarat

ii) GOP (Various Years), Statistical Abstract of Punjab (Various Issues), Chandigarh, Economic and Statistical Organisation, Government of Punjab

#### 4.2. Dairy processing sector in Gujarat and Punjab:

Selected characteristics of manufacturing of dairy products by 3-digit industry group (NIC-2008) for Gujarat and Punjab are presented in table 1.2. There is a huge difference in the number of factories and factories operating in the states of Gujarat and Punjab. The number of factories dealing with the manufacturing of dairy products in Gujarat was 89 during 2008-09 as against only 49 factories in Punjab though all of these factories were operational in both the states. The number increased to 112 in 2010-11 and further to 132 in 2011-12 in Gujarat,

**Table 1.2: Manufacturing of dairy products by 3-digit industry group (NIC-2008) in Gujarat and Punjab (Values in Rs lakhs unless otherwise mentioned)**

| S.No   | Characteristics                         | Gujarat |         |         |         |         |         |
|--------|---|---------|---------|---------|---------|---------|---------|
|        |   | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | Average |
| 1      | Number of Factories(no.)                | 89      | 79      | 112     | 132     | 114     | 105     |
| 2      | Factories in Operation)                 | 89      | 79      | 101     | 117     | 96      | 96      |
| 3      | Fixed Capital                           | 80016   | 100370  | 111715  | 154313  | 182849  | 125853  |
| 4      | Physical Working Capital                | 66671   | 75660   | 78117   | 93127   | 140778  | 90871   |
| 5      | Working Capital                         | 24461   | 50221   | 13296   | 70078   | 142451  | 60101   |
| 6      | Invested Capital                        | 146686  | 176030  | 189832  | 247440  | 323627  | 216723  |
| 7      | Gross Value Addition to Fixed Capital   | 17166   | 33348   | 22927   | 48258   | 45047   | 33349   |
| 8      | Rent Paid for Fixed Assets              | 550     | 1202    | 594     | 566     | 371     | 657     |
| 9      | No. of persons Engaged                  | 12836   | 13113   | 15156   | 16185   | 12638   | 13986   |
| 9.1    | Workers                                 | 9194    | 8828    | 10545   | 11453   | 9297    | 9863    |
| a)     | Directly Employed                       | 4633    | 4640    | 5711    | 5666    | 4282    | 4986    |
|        | Men                                     | 4580    | 4621    | 5664    | 5632    | 4255    | 4950    |
|        | Women                                   | 53      | 19      | 47      | 34      | 27      | 36      |
| b)     | Emp. through Contractors                | 4561    | 4189    | 4833    | 5787    | 5016    | 4877    |
| 9.2    | Employees other than workers            | 3632    | 4268    | 4605    | 4723    | 3311    | 4108    |
| a)     | Supervisory and Managerial              | 1292    | 1242    | 1423    | 1556    | 1100    | 1323    |
| b)     | Other Employees                         | 2340    | 3026    | 3182    | 3167    | 2211    | 2785    |
| 9.3    | Unpaid family members/proprietor, etc   | 10      | 16      | 6       | 9       | 31      | 14      |
| 10     | Total Mandays Employed(in '000)         | 4653    | 4769    | 5471    | 5816    | 4546    | 5051    |
| 11     | Wages & Salaries incl. Employer's Contr | 24488   | 27638   | 44055   | 34839   | 34781   | 33160   |
| 11.1   | Wages and Salary including Bonus        | 19645   | 21985   | 28791   | 29302   | 29255   | 25796   |
| 11.1.1 | Wages and Salary                        | 18429   | 20765   | 26660   | 27592   | 27484   | 24186   |
| a)     | Workers                                 | 8544    | 9085    | 11956   | 12792   | 12112   | 10898   |
| b)     | Supervisory & Managerial                | 5319    | 5900    | 7209    | 7568    | 8151    | 6829    |
| c)     | Other Employees                         | 4566    | 5780    | 7495    | 7232    | 7221    | 6459    |
| 11.1.2 | Bonus to all Staff                      | 1215    | 1219    | 2131    | 1711    | 1770    | 1609    |
| 11.2   | Employers' Contribution                 | 4843    | 5653    | 15264   | 5537    | 5526    | 7365    |
| 12     | Outstanding Loan                        | 89026   | 158056  | 80623   | 92952   | 257054  | 135542  |
| 13     | Interest Paid                           | 6635    | 8505    | 16131   | 17357   | 22016   | 14129   |
| 14     | Rent rece. for Fixed Assets             | 76      | 185     | 144     | 142     | 101     | 130     |
| 15     | Interest Received                       | 3402    | 6828    | 7595    | 12189   | 14997   | 9002    |
| 16     | Gross Value of Plant &Mac.              | 84579   | 94883   | 107048  | 122937  | 135169  | 108923  |
| 17     | Value of Product and By-Product         | 698947  | 946044  | 1237411 | 1291158 | 1194122 | 1073536 |

|    |                               |        |        |         |         |         |         |
|----|-------------------------------|--------|--------|---------|---------|---------|---------|
| 18 | Total Output                  | 745365 | 985908 | 1259101 | 1332237 | 1242848 | 1113092 |
| 19 | Fuels Consumed                | 23224  | 21232  | 27098   | 33852   | 35620   | 28205   |
| 20 | Materials Consumed            | 592874 | 789853 | 1066526 | 1142702 | 1044094 | 927210  |
| 21 | Total Inputs                  | 645216 | 839554 | 1152357 | 1248487 | 1166102 | 1010343 |
| 22 | Gross Value Added             | 100149 | 146354 | 106744  | 83750   | 76746   | 102749  |
| 23 | Depreciation                  | 6518   | 9199   | 10374   | 11358   | 11795   | 9849    |
| 24 | Net Value Added               | 93630  | 137155 | 96370   | 72393   | 64951   | 92900   |
| 25 | Net Fixed Capital Formation   | 9349   | 25694  | 10292   | 34429   | 28223   | 21597   |
| 26 | Gross Fixed Capital Formation | 15867  | 34893  | 20665   | 45787   | 40017   | 31446   |
| 27 | Addition in stock of          | -341   | -1779  | 5882    | 22474   | 56821   | 16611   |
| a) | Materials, Fuels, etc         | 525    | 4731   | 2604    | 4473    | -1689   | 2129    |
| b) | Semi Finished Goods           | -817   | -480   | 3116    | 7888    | 5293    | 3000    |
| c) | Finished Goods                | -49    | -6030  | 162     | 10113   | 53217   | 11483   |
| 28 | Gross Capital Formation       | 15527  | 33115  | 26548   | 68261   | 96839   | 48058   |
| 29 | Income                        | 86445  | 127448 | 79645   | 54471   | 57646   | 81131   |
| 30 | Profit                        | 61958  | 99811  | 35590   | 19631   | 22865   | 47971   |

Table 1.2 cont....

| S.No   | Characteristics                         | Punjab  |         |         |         |         |         |
|--------|---|---------|---------|---------|---------|---------|---------|
|        |   | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | Average |
| 1      | Number of Factories(no.)                | 49      | 41      | 57      | 62      | 56      | 53      |
| 2      | Factories in Operation)                 | 49      | 41      | 50      | 53      | 50      | 49      |
| 3      | Fixed Capital                           | 37345   | 8313    | 42803   | 48902   | 57474   | 38967   |
| 4      | Physical Working Capital                | 31470   | 21546   | 36101   | 42051   | 50009   | 36235   |
| 5      | Working Capital                         | 6000    | -991    | 1235    | 37926   | 19459   | 12726   |
| 6      | Invested Capital                        | 68816   | 29860   | 78904   | 90953   | 107483  | 75203   |
| 7      | Gross Value Addition to Fixed Capital   | 17560   | 1860    | 12803   | 15442   | 13533   | 12240   |
| 8      | Rent Paid for Fixed Assets              | 945     | 420     | 528     | 280     | 395     | 514     |
| 9      | No. of persons Engaged                  | 6832    | 4560    | 7556    | 8950    | 8244    | 7228    |
| 9.1    | Workers                                 | 5189    | 3414    | 5816    | 7403    | 6404    | 5645    |
| a)     | Directly Employed                       | 3558    | 2615    | 3676    | 4631    | 3328    | 3562    |
|        | Men                                     | 3493    | 2556    | 3608    | 4569    | 3195    | 3484    |
|        | Women                                   | 65      | 59      | 68      | 62      | 133     | 77      |
| b)     | Emp. through Contractors                | 1631    | 799     | 2140    | 2772    | 3076    | 2084    |
| 9.2    | Employees other than workers            | 1616    | 1132    | 1740    | 1546    | 1836    | 1574    |
| a)     | Supervisory and Managerial              | 459     | 244     | 457     | 475     | 533     | 434     |
| b)     | Other Employees                         | 1157    | 888     | 1283    | 1071    | 1303    | 1140    |
| 9.3    | Unpaid family members/proprietor, etc   | 27      | 13      | 0       | 0       | 4       | 9       |
| 10     | Total Mandays Employed(in '000)         | 2400    | 1615    | 2539    | 2881    | 2729    | 2433    |
| 11     | Wages & Salaries incl. Employer's Contr | 13887   | 8156    | 18063   | 22523   | 26110   | 17748   |
| 11.1   | Wages and Salary including Bonus        | 12209   | 7052    | 14125   | 17840   | 19945   | 14234   |
| 11.1.1 | Wages and Salary                        | 12028   | 6952    | 13909   | 17702   | 19790   | 14076   |
| a)     | Workers                                 | 7247    | 3979    | 7443    | 11344   | 10573   | 8117    |
| b)     | Supervisory & Managerial                | 2472    | 1008    | 3005    | 3524    | 4397    | 2881    |
| c)     | Other Employees                         | 2309    | 1965    | 3461    | 2834    | 4820    | 3078    |
| 11.1.2 | Bonus to all Staff                      | 182     | 100     | 216     | 139     | 155     | 158     |
| 11.2   | Employers' Contribution                 | 1678    | 1104    | 3938    | 4683    | 6165    | 3514    |

|    |                                 |        |        |        |        |        |        |
|----|---------------------------------|--------|--------|--------|--------|--------|--------|
| 12 | Outstanding Loan                | 29944  | 9646   | 20909  | 76365  | 21314  | 31636  |
| 13 | Interest Paid                   | 2952   | 2156   | 2781   | 816    | 3459   | 2433   |
| 14 | Rent rece. for Fixed Assets     | 131    | 105    | 4      | 13     | 37     | 58     |
| 15 | Interest Received               | 110    | 104    | 35     | 43     | 42     | 67     |
| 16 | Gross Value of Plant &Mac.      | 56975  | 13743  | 56674  | 62370  | 76670  | 53286  |
| 17 | Value of Product and By-Product | 249765 | 167366 | 345809 | 382461 | 423028 | 313686 |
| 18 | Total Output                    | 293031 | 179361 | 363635 | 405585 | 452509 | 338824 |
| 19 | Fuels Consumed                  | 10695  | 5486   | 13582  | 15634  | 17951  | 12670  |
| 20 | Materials Consumed              | 208061 | 140544 | 300654 | 327300 | 366305 | 268573 |
| 21 | Total Inputs                    | 270125 | 163237 | 336621 | 374458 | 418807 | 312650 |
| 22 | Gross Value Added               | 22906  | 16124  | 27014  | 31127  | 33702  | 26175  |
| 23 | Depreciation                    | 3650   | 982    | 4145   | 5321   | 5477   | 3915   |
| 24 | Net Value Added                 | 19255  | 15142  | 22869  | 25806  | 28225  | 22259  |
| 25 | Net Fixed Capital Formation     | 14348  | 695    | 5068   | 8356   | 7202   | 7134   |
| 26 | Gross Fixed Capital Formation   | 17998  | 1676   | 9214   | 13677  | 12680  | 11049  |
| 27 | Addition in stock of            | 4028   | 2412   | -7782  | 12259  | 3156   | 2815   |
| a) | Materials, Fuels, etc           | 1303   | -653   | 112    | 4548   | -3767  | 309    |
| b) | Semi Finished Goods             | 508    | -70    | 1246   | -265   | 3777   | 1039   |
| c) | Finished Goods                  | 2217   | 3135   | -9140  | 7976   | 3146   | 1467   |
| 28 | Gross Capital Formation         | 22026  | 4088   | 1431   | 25937  | 15835  | 13863  |
| 29 | Income                          | 15358  | 12565  | 19561  | 24710  | 24441  | 19327  |
| 30 | Profit                          | 1472   | 4410   | 1499   | 2187   | -1669  | 1580   |

Source: GOI (Various Years), Annual Survey of Industries, New Delhi, Central Statistical Organisation, Department of Statistics, Ministry of Statistics and Programme Implementation, Government of India

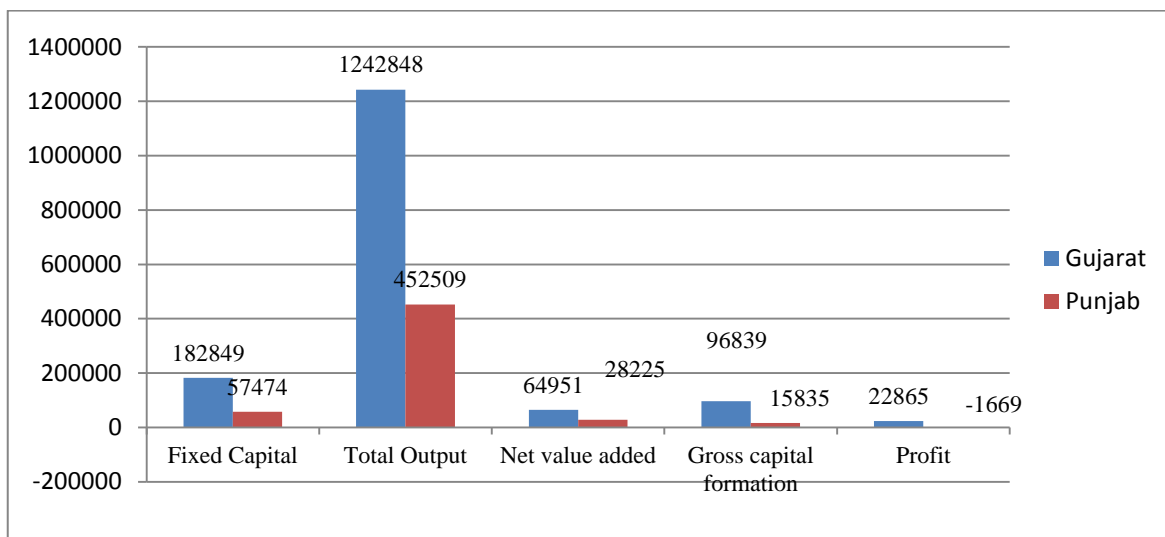
Out of which only 101 were in operation during 2010-11 and 117 in 2011-12. On the other hand in Punjab, the number of factories manufacturing dairy products increased from 57 in 2010-11, out of which 50 were in operation to 62 in 2011-12, out of which 53 were operating. There is however a decline in the number of factories in both the states in 2012-13 but Gujarat still has nearly twice the number of factories and factories in operation as compared with Punjab.

Both the states of Gujarat and Punjab recorded nearly Rs 17000 lakhs gross value addition to fixed capital initially in 2008-09. Thereafter Punjab registered a sudden decline in 2009-10 but on the other hand, gross value addition to fixed capital almost doubled in Gujarat during this period. Though Gujarat recorded a decline in 2010-11 but the state outperformed Punjab in the later period. There was a difference in the value of Rs 31514 lakhs in 2012-13 between the two states. Even the number of persons engaged that includes workers employed directly and through contractors, employees other than workers and unpaid family members in the manufacturing of dairy products are higher in Gujarat but Punjab holds the higher number of women directly employed in the manufacturing of dairy products. With higher number of workers in the state, the wages and salaries are also higher in Gujarat.

Initially Punjab recorded higher gross capital formation of Rs 22026 lakhs as compared to Rs 15527 lakhs in Gujarat in 2008-09. But thereafter Gujarat surged ahead Punjab recording nearly double gross capital formation in 2009-10 whereas on the other hand there was a sudden decline in gross capital formation during this period in Punjab. Thereafter in 2012-13, the gross capital formation in the state of Gujarat was Rs 96839 lakhs whereas it was only Rs 15835 lakhs in Punjab. Even the profit in the manufacturing of dairy sector in Punjab is very low as compared to the state of Gujarat. During 2008-09, the profit in Punjab was only Rs 1472 lakhs whereas Gujarat recorded as high as Rs 61958 lakhs. Thereafter the profit margin declined in both the states in 2010-11. The decline in profit continued in Gujarat in 2011-12 as well and on the other hand Punjab recovered marginally. Further in 2012-13, Gujarat made up for the previous decline in profits but Punjab performed poorly and recorded a loss of Rs 1669 lakhs.

A comparative view of the characteristics including fixed capital, total output, net value added, gross capital formation and profit in Gujarat and Punjab in 2012-13 is presented in the graphical form in figure 1.1. It collaborate our earlier discussion that Gujarat outperforms Punjab in these respects.





Source: Table 1.2

**Figure 1.1: Structure of dairy-processing sector in Gujarat and Punjab in 2012-13**

Further, the performance of milk processing industry in Gujarat and Punjab is evaluated on the basis of three indicators- productivity, profitability and value addition. In order to examine the productivity, we have calculated both, partial factor productivity of capital and the total factor productivity for analysing the comparative performance of industry in Gujarat and Punjab. The results for partial factor productivity of capital are presented in table 1.3.

Initially the productivity of capital ratio was higher in Gujarat in 2008-09 as compared to Punjab. It increased in both the states in 2009-10. The momentum of growth continued in Gujarat in 2010-11 but Punjab on the other hand recorded a decline. There has been a continuous decline in the ratio till 2012-13 in both the states but during the latter period, Punjab registered a high capital productivity ratio i.e. 4.21 as compared to 3.84 in Gujarat. The average capital productivity ratio is however higher in Gujarat as compared to Punjab during 2008-13.

**Table 1.3: Capital productivity ratio in Gujarat and Punjab**

| Year           | Gujarat | Punjab |
|----------------|---------|--------|
| 2008-09        | 5.08    | 4.25   |
| 2009-10        | 5.60    | 6.00   |
| 2010-11        | 6.63    | 4.60   |
| 2011-12        | 5.38    | 4.45   |
| 2012-13        | 3.84    | 4.21   |
| <b>Average</b> | 5.30    | 4.70   |

Source: Table 1.2

The information relating to the total factor productivity in Gujarat and Punjab is shown in table 1.4. Higher total factor productivity interprets higher production efficiency i.e. both labour and capital can earn sufficient rate of returns. It was initially higher in Gujarat as compared to Punjab. Since 2010-11 there has been continuous decline in the total factor

**Table 1.4: Total factor productivity in Gujarat and Punjab**

| Year                      | Gujarat | Punjab |
|---------------------------|---------|--------|
| 2008-09                   | 1.15    | 1.08   |
| 2009-10                   | 1.17    | 1.09   |
| 2010-11                   | 1.09    | 1.08   |
| 2011-12                   | 1.06    | 1.08   |
| 2012-13                   | 1.06    | 1.08   |
| <b>Average</b>            | 1.11    | 1.08   |
| <b>Standard Deviation</b> | 0.05    | 0.007  |

Source: Table 1.2

Productivity in Gujarat. During 2012-13, the total factor productivity was a little higher in Punjab i.e. 1.08 as against 1.06 in Gujarat. Besides total factor productivity, table 1.4 also presents the variation in productivity in the states of Gujarat and Punjab during 2008-13. Interestingly it comes out that the magnitude of standard deviation in Punjab is less than Gujarat. This seems to suggest that Punjab is less amenable to production variations as compared to Gujarat.

Profitability is the second indicator used to study the performance of milk processing industry in Gujarat and Punjab. The information provided in table 1.5 brings out that the profitability is higher in Gujarat recording an average of 26.53 per cent as compared to Punjab with only an average of 3.92 per cent during 2008-2013. Even during 2008-09 Gujarat performed exceptionally well registering a profit of more than 40 per cent and on the contrary it was only 2 per cent in Punjab. Though there has been a decline in the profit since 2010-11 in Gujarat but its performance is still satisfactory with profit of nearly 7 per cent as against loss of -1.55 per cent in Punjab in 2012-13.

**Table 1.5: Profit per capital in Gujarat and Punjab (Percentage)**

| Year           | Gujarat | Punjab |
|----------------|---------|--------|
| 2008-09        | 42.23   | 2.139  |
| 2009-10        | 56.70   | 14.76  |
| 2010-11        | 18.74   | 1.89   |
| 2011-12        | 7.93    | 2.40   |
| 2012-13        | 7.06    | -1.55  |
| <b>Average</b> | 26.53   | 3.92   |

*Source: Table 1.2*

To further explore the comparative strength of the milk processing industry in Gujarat and Punjab, Gross and Net value added per capital are calculated and the results are presented in table 1.6. Higher net value added leads to higher growth and the generation of more jobs in the economy.

**Table 1.6: Gross and net value added per capital in Gujarat and Punjab**

| Year           | Gujarat                   |                         | Punjab                    |                         |
|----------------|---------------------------|-------------------------|---------------------------|-------------------------|
|                | Gross value added/capital | Net value added/capital | Gross value added/capital | Net value added/capital |
| 2008-09        | 0.68                      | 0.63                    | 0.33                      | 0.27                    |
| 2009-10        | 0.83                      | 0.77                    | 0.53                      | 0.50                    |
| 2010-11        | 0.56                      | 0.50                    | 0.34                      | 0.28                    |
| 2011-12        | 0.33                      | 0.29                    | 0.34                      | 0.28                    |
| 2012-13        | 0.23                      | 0.20                    | 0.31                      | 0.26                    |
| <b>Average</b> | 0.52                      | 0.47                    | 0.37                      | 0.31                    |

*Source: Table 1.2*

Initially Gujarat had a higher gross as well as net value added per capital as compared to Punjab. The gross and net value added per capital increased from 2008-09 to 2009-10 and then declined in the succeeding year in both the states of Gujarat and Punjab. Afterwards, it declined further in both the states but during 2012-13, the gross and net value added per capital was higher in Punjab as compared to Gujarat. If we look at the average gross and net value added per capital during 2008-2013, it was higher in Gujarat as against Punjab.

#### **4.3 Operational performance of GCMMF and MILKFED:**

A comparative analysis of the performance of GCMMF (Gujarat) and MILKFED (Punjab) in terms of functional societies, its membership, average daily milk procurement and sales turnover is presented in table 1.7. Though GCMMF has recorded twice the number of societies as compared to MILKFED but both the cooperative federations recorded almost same growth trend of 4.7 per cent per annum in the number of societies during 2006-12. However, the growth of the number of society members in GCMMF is almost double than MILKFED. The average number of members also recorded a huge difference recording 3.72 lakhs in MILKFED as against 28.73 in GCMMF. The average daily milk procurement in GCMMF is also very high recording nearly nine times the daily milk procurement in MILKFED. The sales of GCMMF have registered remarkable growth of 22.23 per cent per annum from Rs 4277 crore in 2006-07 to Rs



11668 crore in 2011-12. Though Punjab has also recorded growth in the sales of nearly 16 per cent per annum during the same period but the average value of sales turnover is very less recording Rs 1196 crore as against Rs 7615

**Table 1.7: Operational performance of GCMMF and MILKFED**

| Year         | Functional societies (number) |         | Membership (lakhs) |         | Average daily milk procurement (lakh lts/day) |         | Sales turnover (in crore) |         |
|--------------|-------------------------------|---------|--------------------|---------|---|---------|---------------------------|---------|
|              | GCMMF                         | MILKFED | GCMMF              | MILKFED | GCMMF   | MILKFED | GCMMF                     | MILKFED |
| 2006-07      | 12792                         | 5989    | 26.05              | 3.60    | 65.33   | 7.78    | 4277                      | 761     |
| 2007-08      | 13141                         | 6155    | 27.16              | 3.65    | 73.72   | 8.21    | 5255                      | 931     |
| 2008-09      | 13328                         | 6432    | 27.98              | 3.65    | 83.91   | 9.21    | 6711                      | 1116    |
| 2009-10      | 15322                         | 6474    | 29.09              | 3.65    | 90.93   | 9.49    | 8005                      | 1254    |
| 2010-11      | 15712                         | 6814    | 30.31              | 3.75    | 92.37   | 10.48   | 9774                      | 1524    |
| 2011-12      | 16117                         | 7543    | 31.81              | 4.01    | 97.41   | 10.94   | 11668                     | 1590    |
| Average      | 14402                         | 6568    | 28.73              | 3.72    | 83.95   | 9.35    | 7615                      | 1196    |
| CAGR (% p.a) | 4.73                          | 4.72    | 4.08               | 2.18    | 8.32  | 7.06    | 22.23                     | 15.89   |

Source: i) GCMMF (2012), Annual Report, Anand, Gujarat Co-operative Milk Marketing Federation Limited

ii) MILKFED (2012), Annual Report, Chandigarh, Punjab State Cooperative Milk Producers' Federation

Crete in GCMMF during 2006-12. Though there is a very less difference in the growth of the number of societies, average daily milk procurement and even sales turnover but there is a significant difference in the value terms of all the indicators among the two federations. MILKFED should learn from GCMMF to improve its performance in the milk processing sector in Punjab.

## 5. SUMMARY

In respect of the growth of milk processing sector in the states of Gujarat and Punjab, it is being growingly observed that the Punjab economy is facing numerous constraints so far as this sector is concerned. There is not much scope for the expansion of the dairy processing sector in the state as compared to Gujarat. Gujarat is flooded with a large number of milk plants and chilling centres for milk processing as compared to Punjab. Even their chilling capacity is very high as against Punjab. Taking an overall view of the performance of milk processing sector in Gujarat and Punjab, it was examined that there was not much difference in the capital productivity ratio and the total factor productivity in Gujarat and Punjab. In the initial period of 2008-09, the capital productivity ratio and total factor productivity were higher in Gujarat as against Punjab but in 2012-13, the productivity was higher in Punjab as compared to Gujarat. If we look at the profitability factor, Gujarat had recorded higher profit per capital with a better margin as against Punjab throughout all the years. On the other hand, Gujarat had a higher Net Value added (NVA) per capital as compared to Punjab till 2011-12 but Punjab surged ahead Gujarat in terms of Net Value Added per capital in 2012-13. The comparative analysis of the major cooperative federations operating in Gujarat and Punjab that include GCMMF and MILKFED shows that the performance of GCMMF is far satisfactory in terms of number of functional societies, its membership, average daily milk procurement and sales turnover. MILKFED needs to make efforts for improving its performance in the milk processing sector in Punjab.

Overall, the results emanating from our study indicate that Gujarat has a vast scope to grow in the milk processing sector. As regards the concerns emerging for the growth of milk processing sector in the state of Punjab, one can pin-pointedly focus on the declining share of the state in the national milk production because of the decline in the number of milch indigenous cattle and buffaloes in the state (GOI, 2012). Even if we look at the functioning of the cooperatives which play a major role in the milk processing sector, Gujarat outperforms Punjab in this respect as well.

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