



# Value Chain Mapping of Standardized Milk in Cooperative and Private Dairy Plants in Andhra Pradesh

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## ABSTRACT

A study on value chain mapping of standardized milk has been carried out in Chittoor and Vishakhapatnam districts of Andhra Pradesh. A predetermined sample of 80 dairy farmers were drawn randomly from selected four villages of Chittoor and Vishakhapatnam districts of Andhra Pradesh. Two collection centres each from Vishakhapatnam cooperative and Chittoor private processing plants were selected for mapping of formal value chain. Study revealed that the procurement cost of milk for Chittoor private dairy processing plant (Rs. 1.40/l) was found to be higher than Vishakhapatnam cooperative dairy processing plant (Rs. 1.37/l). This was mainly due to handling of less quantity of milk by the private dairy plant. However, 14.60 per cent higher processing cost of standardized milk was witnessed in case of cooperative dairy plant. Higher marketing efficiency of private dairy plant (2.02) than cooperative dairy plant (1.78) was mainly due to lower marketing cost, which reveals better management of private dairy plant.

**Key Words:** Value chain, milk, marketing efficiency

## INTRODUCTION

Dairy sector plays an important role in India's agricultural economy, because it has a capacity to generate income and employment for rural livelihood. India has now attained a status of largest milk producer in the world with 221.1 Mt of milk production and per capita availability of 441 g/day (GOI 2022). This is because of extensive dairy development programs and increased consumer demand for value-added products. Dairy sector slowly shifting from traditional to advanced due to the technological advancements. This coupled with changing consumers taste and preferences have increased the demand of different value added dairy products such as condensed milk, flavoured milk, health drinks, ice cream, milk powder, homogenized milk, pasteurized milk, etc. (Singh and Datta, 2010). Around 70 million farmers are engaged in dairy farming; their income depends on prevailing milk procurement, processing and marketing system-dominated by informal system.

Traditional food production methods are being replaced by practices that are closer to manufacturing processes, with greater coordination among farmers, processors, retailers, and other value chain stakeholders (Kumar *et al*, 2011). Furthermore, as income rises, so does the pattern of food consumption. Mapping of milk value chain provides better understanding of key capabilities of various actors involved in the chain and helps in improving overall efficiency of processing and marketing. Andhra Pradesh is predominately an agricultural state with an excellent potential for milk production. Andhra Pradesh has renowned breeds of cattle like Ongole and Punganur and Buffalo (Godavari). Over last decade ending 2017-18, milk production in Andhra Pradesh has increased to 137.25 lakh tonnes (LT) with an annual growth rate of above 7 per cent (NDDB, 2018). The per capita availability of milk was 623 g/day during 2018-19 (NDDB Annual Report, 2018-19). In Andhra Pradesh, dairy is an important secondary

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**Table 1. Total cost of milk procurement (₹/litre)**

Components	Cooperative dairy plant	Private dairy plant
	Cost per litre	Cost per litre
Cost of collection (1)	0.48	0.56
Cost of transportation (2)	0.80	0.73
Cost of reception (3)	0.09	0.11
Procurement cost (1+2+3)	1.37	1.40

source of income for rural families. The supply of milk and milk products to the increasing population is growing continuously.

In Andhra Pradesh, 30% of the total market share is in the organized sector, and nearly 50 % of the total market is regulated by private companies, while the remaining 20% of the demand is met by local milk vendors (Sujatha *et al.*, 2015).

### MATERIALS AND METHODS

Andhra Pradesh was selected for the study, as the state ranked among top five milk producer states in the country and per capita milk availability is more than double the national average. Krishna, Prakasam, Guntur, Chittoor and East Godavari districts of Andhra Pradesh, together produced about half of the total milk production in the state. Two districts Chittoor and Vishakhapatnam of Andhra Pradesh were selected purposively for the study. Milk production in Chittoor, has increased dramatically, but the potential role of dairy farming as a tool for economic development remains unexplored. Household incomes, rural employment, and regional competitiveness in milk production are still to be realized (Murthy *et al.*, 2012). Chittoor private dairy plant and Vishakhapatnam cooperative dairy plant were selected in order to compare procurement, processing and marketing aspects of cooperative vs private dairy plants. Two milk collection centres, each from cooperative and private dairy plant were selected. Further, 20 milk producers from each society was selected purposively. Primary data were collected from milk producers and secondary data pertains to milk processing plants were also collected.

### Analytical Framework

#### Procurement cost of liquid milk

Cost of milk procurement = Cost of collection + Cost of transportation + Cost of reception.

Cost of collection per litre of milk = .....(1)

Transportation cost per litre of milk =  $TC / MT$

Where,

TC is the total transportation cost

MT is the total quantity of milk transported ... (2)

Cost of reception per litre of milk = ..... (3)

Chilling cost per litre of milk = ... (4)

Procurement cost of milk for both cooperative and private dairy plants was calculated by using tabular analysis.

Processing and manufacture cost of milk contains depreciation on buildings and machinery, cost of raw materials, electricity charges, water and steam charges, refrigeration charges, repair and maintenance, Store and stationary charges, packing material, quality control, milk loses and miscellaneous cost. Mapping of milk value chain was done with the help of system dynamics software Vensim.

#### Marketing efficiency

Marketing efficiency of milk estimated by the ratio of raw material cost to the marketing cost and margin. (Acharya and Agarwal, 2009)

$ME = RC / MC + MM$

where

RC= Raw material cost

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MC= Marketing cost

MM= Marketing margin

### RESULTS AND DISCUSSION

#### Procurement cost of milk

The cost of milk procurement contains cost of milk collection, cost of milk transportation and cost of reception of milk. Table 1 indicates the procurement cost of milk for both cooperative and private milk plant. In case of cooperative dairy plant the per litre cost of milk procurement was estimated at Rs.1.37. Collection cost, transportation cost and reception cost of milk was estimated at Rs.0.48, Rs.0.80 and Rs.0.09 per litre respectively.

Where as in case of private dairy plant, the procurement cost of milk was estimated at Rs.1.40 per litre. Cost of milk collection, transportation and reception cost was estimated at Rs.0.56, Rs.0.73 and Rs.0.11 per litre. It is evident from Table 1 that procurement cost of milk for private dairy plant was higher than cooperative dairy plant due to less handling capacity of milk by the private dairy

plant. Lower cost of milk procurement in case of cooperative was mainly due to economies of scale

#### Processing cost of standardized milk

Processing cost of standardized milk for cooperative dairy plant and private dairy plant was estimated at Rs. 2.04 per litre and Rs.1.78 per litre respectively.

The main actors involved in the selected value chains are: milk producers, milk collection centres, processing plant and consumers (Fig.1 & 2).

#### A comparative analysis of value chains of standardized milk

The comparative analysis of standardized milk value chain for cooperative and private dairy plant was carried out. Various indicators considered for comparison such as: processing cost, manufacturing cost, marketing cost, marketing margin and marketing efficiency are shown in Table 2. The marketing cost of standardized milk was estimated to the tune of Rs. 3.88 per litre and Rs. 3.61 per litre for cooperative and private dairy plant,

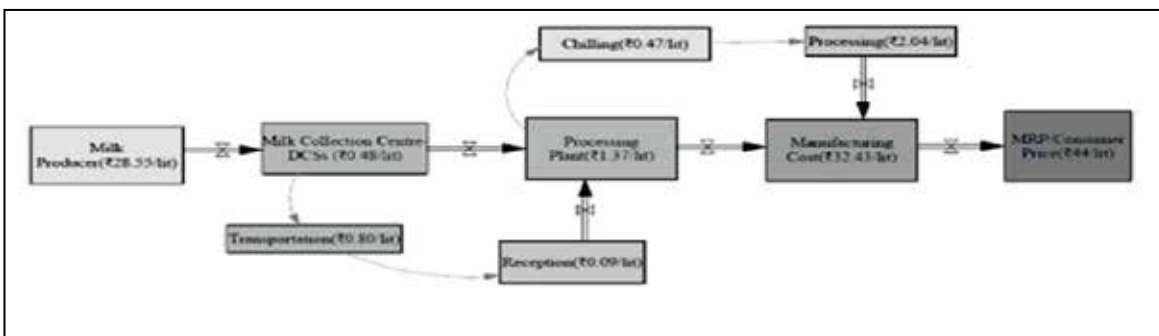


Fig. 1: Value chain mapping of cooperative milk plant

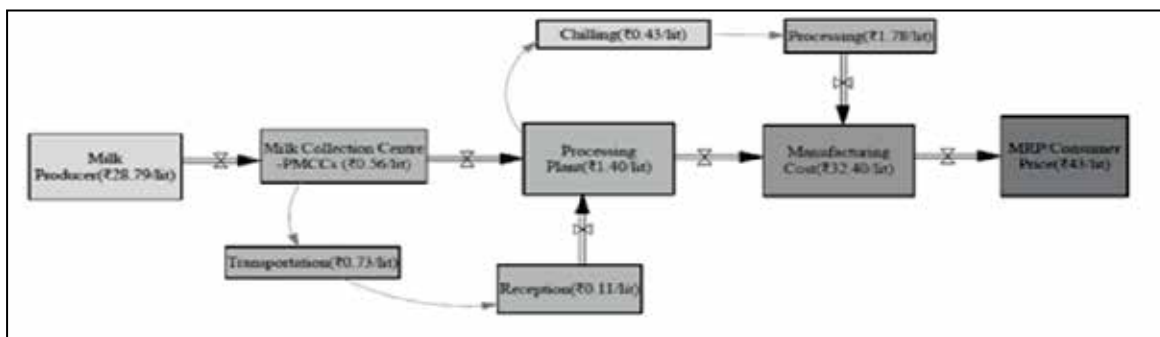


Fig.2 : Value chain mapping of private dairy plant

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**Table 2: A comparative analysis of value chains of standardized milk**

Particulars	Cooperative dairy plant	Private dairy plant
1. Cost of raw material (₹/lit)	28.55	28.79
2. Procurement cost (₹/lit)	1.37	1.40
3. Chilling cost (₹/lit)	0.47	0.43
4. Processing cost (₹/lit)	2.04	1.78
5. Total cost (₹/lit) (1+2+3+4)	32.43	32.40
6. Selling price (₹/lit)	44	43
7. Marketing margin (₹/lit) (6-5)	11.57	10.60
8. Total marketing cost (₹/lit) (2+3+4)	3.88	3.61
9. Marketing cost and margin (₹/lit) (7+8)	15.45	14.21
10. Marketing efficiency (1/9)	1.84	2.02

respectively (Table 2). The marketing cost of milk for cooperative dairy plant consists of procurement cost (i.e., Rs. 1.37/l) chilling cost (Rs.0.47/l) and processing cost (Rs. 2.04/l), whereas, in case of private dairy plant, procurement cost (Rs. 1.40/l), chilling cost (Rs.0.43/l), and processing cost (Rs.1.78/l). The marketing cost and marketing margins were lower for private dairy plant (Rs. 14.21/l) than cooperative dairy plant. (Rs.15.45/l). Higher marketing efficiency of private dairy plant (2.02) than cooperative dairy plant (1.78) was due to lower marketing cost, which reveals about better management of private dairy plant. The result obtained with regards to the value chain analysis of standardized milk was found to be in conformity with the earlier study conducted by Babu and Verma (2010) and Vanishree *et al* (2018).

### CONCLUSION

The procurement cost of milk was found higher for private dairy plant than cooperative milk plant because of handling of lower quantity of milk. Transportation cost of milk accounts highest share in the procurement cost of milk followed by cost of milk collection and cost of milk reception. Hence, there is a need to design efficient transport system for milk so as to reduce the procurement cost. Processing cost of standardized milk was found higher for cooperative dairy plant than private dairy plant. Marketing efficiency for private dairy plant

was found highest than cooperative dairy plant because of lower marketing cost and margin in case of private dairy plant. This may be due to better management of private plants.

### REFERENCES

- Acharya S S and Agarwal N L (2009). Agricultural marketing in India (Fourth edition). Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi
- Annual Report (2018-19). Ministry of Finance, government of Andhra Pradesh, Hyderabad
- Babu D and N K Verma (2010). Value Chains of Milk and Milk Products in Organised Sector of Tamil Nadu-A Comparative Analysis. Agricultural Economics Research Review 23 (Conference Number) pp 479-486.
- GOI (2022). Basic Animal Husbandry Statistics. Ministry of Fisheries, Animal Husbandry and Dairying, Department of Animal Husbandry and Dairying. Krishi Bhawan, New Delhi.
- Kumar A, Singh H, Kumar S and Mittal S (2011). Value chains of agricultural commodities and their role in food security and poverty alleviation – A synthesis. *Agric Econ Res Rev* 24:169-181.
- Murthy M R K, Rao K H and Reddy G P (2012). Evaluating value chain and retailing of milk in Chittoor, Andhra Pradesh. *Int J Eng Res Technol* 1:1-6.
- NDDB (National Dairy Development Board) (2017) Annual report 2018-19.
- Singh S R and Datta K K (2010). Understanding value addition in Indian dairy sector: some perspectives. *J Agric Econ Res Rev* 23 (Conference Number) : 487-493

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Sujatha R V, Suseela T and Suseela K (2015). Milk marketing in co-operative sector and private sector in Andhra Pradesh, India: A Comparative study. *Int J Sci Res* (5):2250-3153

Vanishree M, Sendhil R, Sirohi S, Chauhan A K, Rashmi H M and Ponnusamy K (2018). Value chain analysis of input delivery system for liquid milk in Bengaluru milk union of Karnataka. *Indian J Dairy Sci* 71:502-508.

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