Milk Marketing in Co-operative sector and Private sector in Andhra Pradesh, India: A Comparative study

R.V.Sujatha, T.Suseela and K.Suseela

Horticultural College and Research Institute, Dr.Y.S.R.Horticultural University, Venkataramannagudem, West Godavari dt., A.P

Abstract- The study on market structure, price spread, marketing costs and marketing efficiency for milk in cooperative and private sectors of Andhra Pradesh was conducted during 2013-14.

The market structure analysed using Hirschman – Herfindall index for the presence of monopoly if any, shows that the H value is 0.231, which indicate the lack of monopoly in milk marketing. To estimate sellers concentration, Bain's classification was used according to which farmers are said to constitute a "atomistically competitive" market. Four marketing channels were identified for milk marketing in coastal Andhra region. It was found that producer's share in consumer's rupee is highest in channel - I. Price spread was minimum in channel – I and highest in channel IV. The highest price spread is due to the fact that the intermediary incurred some costs and retained some portion of profit which added to the inflated price spreads. Channel-I was found to be the most efficient channel with highest marketing efficiency. It was observed that in all the channels price paid to the producer was high in private sector compared to cooperative sector. It was also found that price spread was less in private sector and hence the consumer price was also less.

The major constraints identified in milk marketing were high feed cost, inadequate price for milk, poor credit facility, disease outbreak etc. Because of delay in the payment of fee for the milk sold to the cooperative society, the farmers are turning towards private firms. Infrastructures like chilling plant, pasteurization and dairy products processing plants have to be developed.

Index Terms- Competition, Co-operative, Marketing efficiency, Milk, Monopoly, Price spread, Private

I. INTRODUCTION

Livestock development is of special significance to marginal, small farmers and landless laborers who are the weaker sections in rural areas as a means of relieving them from the strains of poverty and under nourishment. Livestock is emerging as a driving force in the growth of agricultural sector of India.

Among various livestock activities, the dairy sub sector occupies an important position in the agricultural economy of India. In dairying, India ranks as the world`s largest milk producer and with an annual growth rate of 4%, India`s milk production accounts for 16% of the total global output. Milk is the second largest agricultural commodity by volume contributing to the GNP next only to rice. In the last three decades, world milk production has increased by more than 50 percent, from 482 million tonnes in 1982 to 754 million tonnes in 2012 (http://www.fao.org/). In India, milk production has increased many folds from 30.54 million tonnes in 1981 to 140.6 million tonnes in 2014 (Economic Times, 2013).

The per capita availability of milk has also increased from 176 grams per day in 1990-1 to 290 grams per day in 2011-12. This is comparable with the world per capita availability of milk at 289.31 grams per day for 2011. (Economic Survey, 2012-13). Andhra Pradesh is the third largest milk producing state in India after Uttar Pradesh and Rajasthan. Andhra Pradesh has recorded 12.76 million tonnes of milk production during 2012-13(Department of Animal Husbandry Dairying & Fisheries (DADF)). Dairy is an important secondary source of income for rural families in Andhra Pradesh and there is a sustained growth in the availability of milk and milk products to the growing population.

Diary development in India has taken place under well known programme known as Operation flood. Diary cooperatives being an integral part of the operation flood programme have played a major role in the production and marketing of milk. Milk being the most perishable commodity requires a quick and an efficient marketing system. It has been found that the organized sector in India hardly handles about twelve percent of the total milk produced. Bulk of the business is transacted through traditional channels. Diary cooperatives have been considered as one of the most important measures to improve the production and ensure efficient marketing. This is the only means through which uniformity in producer's share in consumer's price can be maintained and the concurrent margin can be minimized.

In Andhra Pradesh, 30 per cent of the total market share is in the organized sector, while almost 50 per cent of the total market is controlled by private players, the remaining 20 per cent demand is being met by the local milk vendors (http://www.business-standard.com). Keeping in view these important issues, present study on market structure, price spread, marketing costs and marketing efficiency for milk in cooperative and private sectors of Andhra region of Andhra Pradesh was conducted during 2013-14.

II. METHODOLOGY

In order to achieve the objective, four districts viz., Guntur, Krishna, Nellore and Prakasam districts of Andhra region were chosen purposively as they have highest buffalo population in Andhra region. Among four districts, four milk plants consisting of two plants each from cooperative and private sectors respectively were selected. As desired by the selected milk

plants to keep anonymity of their names, these milk plants were named as CMP I, CMP II, PMP I and PMP II representing cooperative and private milk plants respectively. All these firms procure milk from the dairy farmers and collected milk is transported to chilling center by special transportation system. The collected milk is pasteurized, pocketed and distributed to retail shops/consumers. At the second stage, four villages were selected randomly located at a distance of 10, 15, 18 and above 19 kms from the selected milk plants. At third stage, complete enumeration of milk sellers along with number of milch animals in the selected villages was done pertaining to members and non-members. These milk sellers were classified into three categories on the basis of no. of milch animals. Finally, 120 milk sellers were selected randomly and the frequencies of each category are given as follows.

Category	Size of the group (No. of milch animals)	No .of milk sellers	Total no. of milch animals	Average no. of milch animals
Small	1-4	36 (30.0)	112	3.1
Medium	5-9	48 (40.0)	283	5.9
Large	10 & above	36 (30.0)	554	15.4
	Over all	120 (100.0)	949	8.1

(Figures in parenthesis indicate percentage)

Period of the study:

The reference year of this study was 2013-14 and the data collection was taken up during the months of June and July 2014.

Data Collection:

Structured and pre tested interview schedules were prepared separately for producers and intermediaries. The data were collected by personal Interview method.

Tools of Analysis:

Percentage analysis:

The price spread, marketing cost and marketing margin of various intermediaries involved were computed by conventional analysis in the form of averages.

Market Structure:

The market structure for milk was analysed using the Hirschman-Herfindall Index to assess the monopoly in the system, if any.

$$H = \sum_{i=1}^{n} (P_i)^2$$

Where $P_i = q_i/a$

q_i is the output of the i^{th} farm and a is the total output of all farms and 'n' is the total no. of farms. This weighted index of market (output) share with weights being the shares themselves attains the value of unity in the case of monopoly and approaches to zero as the member farms with identical shares increases.

In the absence of monopoly, Bain's classification was used to identify the prevailing market structure. Bain classified the market structure on the basis of volume of business and on the basis of firms share in the total business. Accordingly, if the top four firms controlled 75-100 percent of the business of a product, it was considered as a highly concentrated oligopoly; for 50-75 percent it was recorded as a moderately concentrated oligopoly; for 25-50 percent, it was called as slightly concentrated oligopoly and for less than 25 percent of the business, it was referred to as atomistically competitive market.

Measurement of Marketing Efficiency:

In this study, the efficiency in marketing of milk was measured by **Acharya's modified method** as follows.

$$ME = \frac{\text{Price received by the farmer}}{\text{Marketing costs + Marketing margins}}$$

III. RESULTS AND DISCUSSION

Market structure:

The prices charged by firms for their products, the nature and extent of their research and development activities, the type of product advertising and the selling techniques the firms employ are all influenced by the structure of markets in which they deal. The market structure was studied for degree of seller (producers) concentration.

The milk marketing system in coastal Andhra region was analysed for the presence of monopoly if any, by means of Hirschman-Herfindall index. The H value as computed for milk marketing at farm level for 120 farms is 0.0231. This low value of Hirschman-Herfindall index indicate the lack of monopoly in production and marketing of milk at farm level.

Bain's classification:

To estimate sellers' concentration, random checks were carried out through out the year. Out of the total supply of milk of the sample dairy farmers in a year, top four farms produced and transacted less than 25 percent. Therefore, as per Bain's classification of market structure, the farmers could be said to constitute an atomistically competitive" market.

Marketing channels:

The following milk distribution channels in the selected areas have been identified.

Channel I : Producer – Milk vendor – Consumer.

Channel II: Producer- Wholesaler - Retailer – Consumer.
Channel III: Producer – Sweetshops/Creamery – Consumer.
Channel IV: Producer – Milk vendor - Sweetshops/Creamery – Consumer.
Channel V: Producer – Consumer.

The price spreads have been worked out for first four channels because through channels V, less quantity of milk was sold and no marketing cost was incurred in channel V.

Producer's share in consumer's price:

The perusal of **table I** shows that the share of producer in consumer's rupee in channel I was highest in PMP II milk plant followed by PMP I, CMP II and CMP I. Here, the village milk vendor purchases the milk from the small producers in and around villages and deliver the collected milk to the door steps of needy consumers. It has been observed that the milk vendors are playing an important role in supplying the milk to the consumers. The producer's share was higher in PMP II and I milk plants because of better competition among the milk buying agencies. As a result, producer received higher price which pushed up the percent share in consumer's price. The marketing margin of milk vendor is highest in CMP I and CMP II.

From **Table 2**, it could be seen that in channel II also, the share of producer in consumer's rupee was highest in PMP II followed by CMP II, PMP I and CMP I. The producer's share in consumer's rupee declined in channel-II as compared to the channel-I because of another intermediary which has stepped into the marketing channel. Here, the price paid to producers almost remain the same in all milk plants pertaining to channel-II as all the wholesalers maintained the same level of prices for their purchasers from the farmers. Price spread was also high compared to channel I which was due to marketing margin of wholesaler and retailer.

Table 3 shows the producer's share has increased both in absolute and percentage terms in channel III compared to channel II. Only one intermediary is present and hence, marketing costs and processing costs are slightly less compared to channel II which reduced the price spread.

In **Table 4**, producer's share in consumer's rupee ranged from 66.36 in CMP II to 66.96 in PMP II. The net margin of sweet shops and creamery has increased despite the fact that the price paid to the producers was higher in channel III as compared to the channel-IV.

Extent of price spreads in various channels:

It can be seen from the **table 5**, that price spread was minimum in channel-I. This may be due to the fact that only one intermediary is involved who is just procuring the milk from the producer and selling it to the consumer without processing.

The price spread in channel II has widened due to the fact that the no. of intermediaries increased in channel II. The price spread in channel III is more compared to channel I even though the milk was directly supplied by the milk producers to the sweetshops/creamery. This was due to the form of milk being sold to consumer because the sweetshops incurred more costs to prepare various milk products. In channel IV, gross price spread was further inflated due to increase in intermediary. In this process, the intermediary incurred some costs and retained some portions of profit which added to the inflated price spreads. Finally, it was observed that in all the channels, price paid to the producer was high in private sector compared to cooperative sector. It was also found that price spread was less in private sectors. Hence the consumer's price was also less.

Efficiency in milk marketing:

Marketing efficiency in different channels of milk marketing was carried out by applying shepherd's formula and the results are presented in **table 6**.

From table 6, it could be inferred that channel I was the most efficient channel with a marketing efficiency of 4.05 followed by channel III. Since, less number of intermediaries were involved, these channels were found to be most efficient.

Constraints in milk production/marketing:

The major problems that were identified in the study area in the production and marketing of milk and are presented below (**Table 7**).The major problems faced by the milk producers are:

1. High feed cost. (81.67%)
2. Low productivity of milch animals (60.00%)
3. Inadequate price for milk (53.33%)
4. Disease outbreak (48.33%)
5. Inadequate storage facilities (38.33%)
6. Poor credit facility (37.50%)
7. Poor transport facilities (26.67%)
8. Small Quantity of Marketable surplus (20.83%)

Majority of the farmers (81.67%) opined that, high feed is the major constraint in milk production and marketing followed by low productivity of milch animals (60%). To overcome these problems, the Indian dairy industry needs to focus simultaneously on the four-fold challenge of quality, product development, infrastructure-support development, and global marketing. Equally urgent is the need for strategic alliances with some of the leading dairy companies in the world for technical collaboration and marketing tie-ups. Raw-milk handling needs to be upgraded in terms of physicochemical and microbiological attributes of the milk collected. Better operational efficiencies are needed to improve yield, reduce waste, minimize fat and protein losses during processing, control production costs, save energy, and extend shelf life. The adoption of Good Manufacturing Practices (GMP) would help manufacture milk products that conform to international standards and thus make exports competitive. (Rajendran and Samarendu Mohanty)

IV. Conclusions

It was observed that major quantity of the milk produced is marketed through cooperatives and private firms only. This is

because, milk is a perishable commodity and has to be used immediately and excess unsold mild has to be stored through special storage system. Further, because of delay in the payment of fee for the milk sold to the cooperative society, the farmers are turning towards private firms. Constraints such as depleting water and fodder resources, animal breeding policies in the country led to a descending trend of loss in genetic diversity, draught power etc . Intensive development of fodder resources such as increasing the area under fodder crops, practice of contract farming for major feed ingredients such as maize and soyabean can enhance the milk production. The improved breeds can only give high milk yields if provided with the necessary feed, water, labour and veterinary health care. In this connection, strategies have to be framed to start modern abattoirs, dairy processing unit, which will improve their marketability in the international market. The cooperatives must raise their professionalism in marketing, building brand equity, strengthening distribution networks and reducing the costs of taking milk from producers to the consumer.

Table 1. Prices spread in channel – I
(Producer – Milk vendor – Consumer)
Rs. /litre

Sl.No	Particulars	CMP–I	CMP–II	PMP–I	PMP–II	Overall
1.	Producer's net Price	32.00 (79.33)	32.04 (79.78)	32.28 (80.62)	32.32 (81.17)	32.16 (80.20)
2.	Costs incurred by milk vendor	3.50 (8.68)	3.40 (8.47)	3.16 (7.89)	3.10 (7.79)	3.30 (8.23)
3.	Net margin of milk vendor	4.84 (11.99)	4.72 (11.75)	4.60 (11.49)	4.40 (11.05)	4.64 (11.57)
4.	Purchase price of Consumer	40.34 (100.00)	40.16 (100.00)	40.04 (100.00)	39.82 (100.00)	40.10 (100.00)
5.	Price spread	8.34 (20.67)	8.12 (20.22)	7.76 (19.38)	7.50 (18.83)	7.94 (19.80)

(Figures in parentheses as percentages of the total)

Table 2. Price spread in channel II
(Producer-wholesaler-retailer-consumer)
(Rs. /litre)

Sl.No	Particulars	CMP–I	CMP–II	PMP–I	PMP–II	Overall
1.	Price received by the producer	31.00 (72.36)	31.08 (73.72)	31.04 (73.82)	31.12 (74.31)	31.06 (73.55)
2.	Costs incurred by wholesaler	3.10 (7.24)	2.88 (6.83)	2.84 (6.75)	2.82 (6.73)	2.91 (6.89)
3.	Net margin of wholesaler	3.44 (8.03)	3.48 (8.25)	3.29 (7.82)	3.00 (7.16)	3.30 (7.81)
4.	Costs incurred by retailer	1.60 (3.73)	1.66 (3.94)	1.58 (3.76)	1.52 (3.63)	1.59 (3.77)
5.	Net margin of retailer	3.70 (8.64)	3.06 (7.26)	3.30 (7.85)	3.42 (8.17)	3.37 (7.98)
6.	Purchase price of Consumer	42.84 (100.00)	42.16 (100.00)	42.05 (100.00)	41.88 (100.00)	42.23 (100.00)
7.	Price spread	11.84 (27.64)	11.08 (26.28)	11.01 (26.18)	10.76 (25.69)	11.17 (26.45)

(Figures in parentheses as percentages of the total)

Table 3. Prices spread in channel – III
(Producer – Sweetshop/Creamery – Consumer)
Rs./litre

S.No	Particulars	CMP–I	CMP–II	PMP–I	PMP–II	Overall
1.	Producer's net Price	32.88 (75.03)	32.56 (74.68)	32.72 (75.39)	33.12 (76.07)	32.82 (75.31)
2.	Costs incurred by sweetshop/creamery	5.78 (13.19)	5.72 (13.12)	5.52 (12.72)	5.20 (11.94)	5.56 (12.76)
3.	Net margin of the sweetshop/creamery	5.16 (11.78)	5.32 (12.20)	5.16 (11.89)	5.22 (11.99)	5.20 (11.93)
4.	Purchase price of consumer	43.82 (100.00)	43.60 (100.00)	43.40 (100.00)	43.54 (100.00)	43.58 (100.00)
5.	Price spread	10.94 (24.97)	11.04 (25.32)	10.68 (24.61)	10.42 (23.93)	10.76 (24.69)

(Figures in parentheses as percentages of the total)

Table 4. Price spread in channel IV
(Producer-Milk vendor-Sweetshop/Creamery-consumer)
(Rs. /litre)

S.No	Particulars	CMP–I	CMP–II	PMP–I	PMP–II	Overall
1.	Producer's net price	29.96 (66.61)	30.06 (66.36)	30.48 (66.78)	30.36 (66.96)	30.22 (66.70)
2.	Costs incurred by milk vendor	4.06 (9.03)	4.02 (8.87)	3.82 (8.37)	3.64 (8.03)	3.88 (8.56)
3.	Net margin of milk vendor	3.36 (7.47)	3.50 (7.73)	3.58 (7.84)	3.56 (7.85)	3.50 (7.72)
4.	Costs incurred by sweetshop/creamery	2.96 (6.58)	3.04 (6.71)	2.98 (6.53)	3.22 (7.10)	3.05 (6.73)
5.	Net margin of the sweetshop/creamery	4.64 (10.32)	4.68 (10.33)	4.78 (10.47)	4.56 (10.06)	4.66 (10.28)
6.	Purchase price of Consumer	44.98 (100.00)	45.30 (100.00)	45.64 (100.00)	45.34 (100.00)	45.31 (100.00)
7.	Price spread	15.02 (33.39)	15.24 (33.64)	15.16 (33.22)	14.98 (33.04)	15.09 (33.30)

(Figures in parentheses as percentages of the total)

Table 5.Pattern of price spreads in milk marketing in various Channels for pooled data

Particulars	Channel I	Channel II	Channel III	Channel IV
Purchase price	32.16 (80.20)	31.06 (73.55)	32.82 (75.31)	30.22 (66.70)
Price spread	7.94 (19.80)	11.17 (26.45)	10.76 (24.69)	15.09 (33.30)
Sale price	40.10 (100.00)	42.23 (100.00)	43.58 (100.00)	45.31 (100.00)

(Figures in parentheses as percentages of the total)

Table 6.Efficiency in milk marketing

Channel	Marketing efficiency
I	4.05
II	2.78
III	3.05
IV	2.01

Table 7. Major Problems of milk producers in production and marketing of milk

S.No	Particulars	No. of respondents	% to total
1	High feed cost	98	81.67
2	Inadequate price for milk	64	53.33
3.	Poor credit facility	45	37.50
4.	Disease outbreak	58	48.33
5.	Small Quantity of Marketable surplus	25	20.83
6.	Poor transport facilities	32	26.67
7.	Delay in payment of price for milk sold	72	60.00
8.	Inadequate storage facilities	46	38.33

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AUTHORS

First Author: Dr.R.V.Sujatha, Assistant Professor (Ag.Econ), Horticultural College and Research Institute, Dr.Y.S.R.Horticultural University, Venkataramannagudem, West Godavari dt., Andhra Pradesh. E-mail : rvsujatha.vibha@gmail.com

Second Author : Dr.T.Suseela, Assistant Professor (Hort), Horticultural College and Research Institute, Dr.Y.S.R.Horticultural University, Venkataramannagudem, West Godavari dt., Andhra Pradesh E-mail : landscapingsusi@gmail.com

Third Author : Ms.K.Suseela, Ph.D.Scholar, TNAU, Coimbatore

Corresponding Author : Dr.R.V.Sujatha, Assistant Professor (Ag.Econ), Horticultural College and Research Institute, Dr.Y.S.R.Horticultural University, Venkataramannagudem, West Godavari dt., Andhra Pradesh. E-mail : rvsujatha.vibha@gmail.com