Journal of Experimental Agriculture International

Volume 46, Issue 9, Page 500-510, 2024; Article no.JEAI.122977
ISSN: 2457-0591
(Past name: American Journal of Experimental Agriculture, Past ISSN: 2231-0606)

Optimizing Dairy Marketing in Karnataka, India: Analyzing Cost, Efficiency and Price Spread Across Channels

Revappa M. Rebasiddanavar [a*], Swati Prakash Relekar [b++], Megha Mallikarjun Doni [c#] and Boggala Vajramma [d†]

[a] Department of Agricultural Economics, NDRI, Karnal, Haryana, India.
[b] Department of Agribusiness Management, University of Agricultural Sciences, Dharwad-580005, Karnataka, India.
[c] Karnataka State Rural Development and Panchayat Raj University, Gadag, India.
[d] CSR&TI, Mysore, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/jeai/2024/v46i92848

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/122977

Original Research Article

Received: 27/06/2024
Accepted: 02/09/2024
Published: 05/09/2024

ABSTRACT

The dairy sector is recognized as a crucial element of India's agriculture, contributing significantly to rural livelihoods and the national economy. This study aimed to investigate the efficiency and cost structures of various milk marketing channels in Karnataka. Data were collected from vendors,

---

[++] *Ph.D Scholar;*
[#] *Assistant Professor;*
[†] *Scientist-B;*
**Corresponding author: E-mail: revappa12345@gmail.com;*

Cite as: *Rebasiddanavar, Revappa M., Swati Prakash Relekar, Megha Mallikarjun Doni, and Boggala Vajramma. 2024. "Optimizing Dairy Marketing in Karnataka, India: Analyzing Cost, Efficiency and Price Spread Across Channels". Journal of Experimental Agriculture International 46 (9):500-510. https://doi.org/10.9734/jeai/2024/v46i92848.*

farmers, and administrative officials, as well as secondary data from commercial dairy plants, to analyze the input-output relationships and marketing efficiency across different channels. Two major districts, Mandya and Dharwad, were selected, and ten creameries, ten milk vendors, four medium-sized dairy plants, and one large commercial dairy plant were examined. Milk marketing channels were categorized into organized and unorganized systems, and the costs and returns associated with each type of intermediary were assessed. The analysis revealed considerable variations in marketing costs and efficiency. Channels with fewer intermediaries, such as direct sales from producers to consumers (Channel-I), were found to have higher efficiency. Conversely, channels involving multiple intermediaries, like those including creameries and vendors (Channel-IV), exhibited higher price spreads and lower efficiency. For instance, Channel-V demonstrated the highest marketing efficiency of 3.94, while Channel-IV showed the lowest efficiency at 2.03. It was observed that a higher number of intermediaries correlated with a larger price spread and reduced marketing efficiency. The study highlighted the need for improving marketing channels and strengthening linkages between farmers and organized sectors to enhance overall productivity and profitability in the dairy industry.

Keywords: Dairy sector; milk marketing efficiency; cost analysis; Karnataka; organized vs. unorganized channels; price spread; producer's share.

1. INTRODUCTION

Agriculture plays a crucial role in the Indian economy and provides livelihoods for a significant portion of the population. Contributing approximately 18.3 percent to the national economy, the sector engages about 45.76 percent of the workforce in agriculture and allied activities (GOI, 2023). Among the various agricultural sectors, dairy farming has been pivotal in the socio-economic development of rural households. Specifically, livestock contributes 16 percent to the income of small farm households compared to 14 percent for all rural households [1]. Additionally, the livestock sector supports the livelihoods of two-thirds of rural communities and employs around 8.8 percent of India's population. It contributes 5.73 percent to India's Gross Domestic Product (GDP) and accounts for 30.13 percent of the total Agricultural GDP. Dairy farming alone supports the livelihoods of approximately 70 million farm families.

The success of dairy enterprises relies heavily on the efficient estimation of the input-output relationship. Due to the perishable nature of milk, especially in rural settings, farmers face challenges in disposing of milk promptly to avoid losses. This often leads to distress sales to secure a minimum price. Additionally, there is significant variability in milk production and consumption across different states and regions.

A major concern is that the unorganized sector handles approximately 80 percent of the total milk collection in India. For the organized sector to thrive, it requires a substantial number of farmers to enhance milk productivity and ensure fair pricing. Strengthening the linkages through effective extension services is essential for achieving these goals. Milk production and marketing involve multiple intermediaries, each adding its share of costs and margins before the product reaches the consumer. With the presence of both organized and unorganized sectors in the region, the structure of milk marketing channels varies significantly, influencing the price spread and the share of producers in the final consumer price. This variation underscores the necessity to assess the economic performance of these channels comprehensively.

In Karnataka, the informal sector, including milk vendors, creameries, and local dairy plants, plays a crucial role in milk distribution. These intermediaries are responsible for the procurement, processing, and retailing of milk, each contributing differently to the overall marketing costs and returns. Understanding these differences is vital for identifying inefficiencies and opportunities for improving market performance. Recent studies highlight that the efficiency of milk marketing channels has a direct impact on the economic well-being of dairy farmers. For instance, higher price spreads, which are the difference between consumer prices and producer prices, often indicate inefficiencies within the marketing chain. Conversely, a higher producer's share in the consumer's rupee suggests a more favorable return to the farmers, enhancing their income and financial stability.

This research aims to provide a detailed analysis of the cost components, marketing efficiency, and price spread in various milk marketing channels. By employing both primary and secondary data sources, this study investigates the operational aspects of different intermediaries, including creameries, vendors, and cooperative milk plants. The findings will offer valuable insights into the effectiveness of current milk marketing systems and suggest potential improvements for boosting the profitability of dairy farming in Karnataka. Understanding the dynamics of these marketing channels is crucial not only for optimizing market performance but also for supporting policy-making processes that can lead to a more equitable distribution of profits along the milk supply chain.

Specific Objectives:

- To study the marketing cost, efficiency and price spread in various channels.

2. METHODOLOGY

For the analysis of the objectives of the study, both primary and secondary data are utilized. The primary data have been collected from the sample respondents through the help of vendors, farmers and from the administration officials with the help of pre-tested questionnaire. The secondary data on several aspects of the activities (balance sheet, procurement etc) of the large commercial dairy plant were collected from different sources depending on the availability of the required information for the study.

2.1 Study Region and Sampling

Two major districts out of 30 districts in Karnataka namely, Mandya and Dharwad were selected purposively for the purposed study. Hebballi block from Dharwad district and Krishnarajpete block from Mandya district were selected randomly. Both the organized and unorganized milk marketing sectors were prevailing in both of the studied districts. Therefore, all the marketing agencies involved in milk collection (formal and informal) were selected for the present study. Thus, 10 creameries, 10 milk vendors, 10 *halwais*, 4 medium size dairy plants and 1 large commercial dairy plant were selected. Number of milch animals in each household was the selection criterion for farming households. After conducting personal interview, the data obtained from the milk producers were categorized in to small (2-11 milch animals), medium (12-15 milch animals) and large (16-24 milch animals) herd size categories using the cumulative square root frequency technique with milch animal as the basis of classification. Thus, total 100 producer households were distributed as 15 small, 24 medium and 61 large herd sized category households.

2.2 Estimation of Marketing Efficiency of Various Milk Marketing Channels

1Cost Components of Market Intermediaries: In the present study, the cost incurred by various market intermediaries can be divided into fixed costs and variable costs. Depreciation on buildings and equipment's, interest on fixed capital, investment on transportation vehicles and other furniture included under Fixed cost. Likewise, variable cost includes expenditure on labour, milk procurement, fuel, electricity and other miscellaneous charges.

2.3 Fixed Costs

a. Interest on fixed capital

Interest on the amount of money spent on building, equipment, transportation vehicles which were worked out on prevailing rate of interest *i.e.* 8 per cent on fixed deposit.

b. Depreciation

It included annual depreciation on equipment's, buildings and transporting vehicles. The depreciation was worked out with the help of capital recovery cost (CRC) method.

2.4 Variable Costs

a. Purchasing cost of milk

The cost of quantities of raw milk actually purchased per day was multiplied by their prices paid to estimate the purchasing cost of milk.

b. Fuel cost

Fuel cost included expenses on petrol for the vehicle, wood and matchbox.

c. Electricity cost

Electricity was used for running electric equipment's like fan, light, fridge, mixer grinder etc.

d. Labour cost

Wage prevailing in the area was taken as labour cost and total expenses on labour was estimated by multiplying the prevailing wage rate with total number of labours were engaged in the business.

e. Miscellaneous cost

Miscellaneous cost included the cost of repair of equipment's and vehicles, cost of gunny bags, cost of chemicals used for making milk products, cost of small glassware etc.

2.5 Estimation of Marketing Efficiency

Information on milk marketing channels, cost and returns of marketing agencies, producer's share in consumer's rupee and price spread was collected and analyzed to calculate marketing efficiency.

2.6 Price Spread

The price spread of an agricultural commodity helped to calculate the economic efficiency of marketing system. Price spread maintained inverse relation with the efficiency therefore smaller price spread would be desirable for higher efficiency of marketing chain. The difference between the price paid by the consumer and price received by the milk producer defined the price spread (Acharya and Agarwal, 2009).

It was calculated as, $P_S = P_C - P_f$

Where,

P_S is the Price spread

P_C is the Consumer's price P_f is Producer's price

2.7 Producer's Share in Consumer's Rupee

It is the price received by the farmers and expressed as a percentage of the price paid by the consumer (Acharya and Agarwal, 2009). The producer's share was calculated with the following formula.

$$P_S = (P_f / P_C) * 100$$

Where,

P_S is the Producer's share in consumer's rupee P_f is Producer's price

P_C is the Consumer's price

2.8 Marketing Efficiency for Different Marketing Channels

Marketing Efficiency of different channels was calculated by using the following formula.

$$MME = FP / (MC + MM)$$

Where,

MME is the Modified Measure of Marketing EfficiencyFP is price received by producer
MC is marketing cost MM is marketing margin

3. RESULTS AND DISCUSSION

3.1 Milk Marketing Channels

Marketing channel consists of a number of intermediaries through which various commodities are transferred from producer to consumer. Milk marketing channels were categorized into organized or formal and unorganized or informal channels depending upon the intermediaries involved, mode of milk procurement, provision of various assistances to producers as well as the net return obtained by the producers and market intermediaries. The analysis informal marketing sector of milk involving various intermediaries like creameries, and milk vendors has been conducted in this section.

The informal milk marketing channels which were found to be active in the study area are:

1. Producer- Consumer
2. Producer - Creameries - Consumer
3. Producer - Milk Vendor- Consumer
4. Producer- Milk Vendor- Creameries- Consumer
5. Producer- co-operatives- Consumer

The investment pattern of intermediaries, cost incurred and returns obtained by the market intermediaries and marketing efficiency of the marketing channels involved in the study area were also worked out and reported in this section. Gupta et al. [2] observed that informal marketing channels typically have higher price spreads and lower efficiency compared to their organized counterparts, reflecting similar

inefficiencies in our study's channels involving multiple intermediaries. Additionally, Sharma et al. [3] reported that direct marketing channels, where producers sell directly to consumers, often yield better returns and efficiency, aligning with our observation that Channel-I, which involves direct sales, demonstrated the highest efficiency and lowest price spread. This finding aligns with Chauhan and Saini [4], who documented that traditional milk marketing channels are less efficient due to higher price spreads and reduced producer shares. Kumar and Verma [5] also found that traditional channels, characterized by multiple intermediaries, exhibit lower efficiency compared to modern, streamlined channels.

3.2 Average Quantity of Raw Milk Handled in the Study Area

Data was collected from the market intermediaries by personal interview. They were found to collect milk from other dairy farmers besides the 100 sample milk producers. The average quantity of raw milk handled per day was found to be highest in case of creamery A (208 liters/day) as they were procuring milk directly from the farmers for comparatively less procurement price. On an average, creamery B, vendor A and vendor B were handling 204 liters, 162 liters and 156 liters of milk per day (Table 1). Santhosh [6] documented that the highest quantity of milk was handled by Channel-III (Milk Producer-DCS -Processing Unit-Milk Parlour-Consumer, ₹1,251 l/day) followed by Channel-I (Milk Producer-Consumer, ₹486 l/day). Patel et al. [7] noted that higher quantities of milk handled by an intermediary are often associated with lower procurement costs, which is consistent with our results where Creamery A, handling a larger volume, procures milk at a lower cost compared to other intermediaries. Reddy and Rao [8] found that traditional dairy intermediaries like creameries often manage larger quantities of milk, benefiting from economies of scale in procurement and distribution. This supports our finding that Creamery A's larger volume handling contributes to its lower procurement cost.

3.3 Investment Pattern of Various Market Intermediaries

Investment on a dairy enterprise depends upon the initial and working capital, scale of business, type of business according to various market intermediaries and different types of equipment's used etc. Average initial investments by different market intermediaries are represented in the Table 2.

3.4 Investment by Creameries

Creameries in the study area were found to collect milk directly from the producers or from the private milk vendors and then further supplied milk to the consumers. They also converted the milk into different products in a small scale and then sold to the local consumers. The creameries were classified as creamery A and creamery B as per the process of procurement of milk. Creamery A collected milk directly from the farmers, whereas creamery B was found to procure from private milk vendors as per their demand. Total average initial investment of creamery A was worked out to be ₹65000/- which comprised of vehicles (₹37000/-) and equipment's (₹28000/-). The proportion of the average investment on vehicles was found to be higher (56.92%) in comparison to the equipment's (43.07%). Total average initial investment made by creamery B was estimated to be ₹64000/- out of which ₹37000/- had been invested upon vehicles, whereas ₹27000/- (42.18%) had been invested on equipment's. In case of creameries, the initial investment on equipment's was found to be higher as compared to other intermediaries since they require a large set of equipment's (refrigerator, cheese production lines, blenders, weighing balance, furniture, etc.) for setting up of a creamery unit. Singh [9] found that private vendors invest significantly in transportation to enhance milk distribution efficiency, which aligns with our results showing substantial investment in vehicles by vendors such as Vendor A and Vendor B. Yadav and Singh [10] highlighted that traditional milk vendors invest heavily in transportation to ensure efficient delivery, a finding echoed in our study where vendors like Vendor A and Vendor B allocated significant resources to vehicles. This reflects the traditional marketing model, where transportation investment is crucial due to the dispersed nature of dairy farming and the need for regular deliveries.

3.5 Investment by Vendors

Private milk vendors are usually engaged in procurement of milk from the producers and supplying the milk directly at the consumers' doorstep or to other market intermediaries involved in the milk marketing chain. In the present study, vendors are classified as vendor A and vendor B. Vendor A was involved in directly supplying the milk to the consumers, whereas vendor B was supplying milk to the creamery

units as per their demand. They made various initial investments on vehicles (motorcycles) and equipment's (aluminum or plastic milk cans, weighing balances *etc.*). The average initial investment was found to be higher for vehicles in comparison to equipment's in case of both vendor A and B. Total initial investment in case of vendor A was worked out to be ₹47680/- which comprised of vehicles (₹46000/-) and equipment's (1680/-). The proportion of average investment in case of vendor A on vehicles was estimated to be 96.47 per cent, followed by equipment's (3.53 per cent). Total average initial investment of vendor B was found to be 51680/-, out of which 50000/- and 1680/- were invested on vehicles and equipment's, respectively. The share of vehicles in average initial investment was found to be higher (96.75%) in comparison to equipment's (3.25%). Gupta et al. [2] highlighted that differences in costs and returns among intermediaries are influenced by operational scale and efficiency. This is consistent with our observation that intermediaries like Creamery B and Vendor A have higher marketing costs, reflecting their larger operational scale.

3.6 Costs and Returns of Milk Market Intermediaries

Costs and returns obtained by different market intermediaries depend upon their investment, operational expenses as well as scale of marketing of milk. The costs and returns incurred by the market intermediaries involved in informal sector of milk marketing are represented in the Table 3.

Table 1. Quantity of milk handled by different market intermediaries (lit/day)

Market intermediaries	Average quantity of milk (lit/day)
Creamery A	208
Creamery B	204
Vendor A	162
Vendor B	156

Table 2. Average initial investment by market intermediaries (₹)

Particulars	Investment on		Total
	Vehicles	Equipment's	
Creamery A	37000 (56.92)	28000 (43.07)	65000 (100.00)
Creamery B	37000 (57.82)	27000 (42.18)	64000 (100.00)
Vendor A	46000 (96.47)	1680 (3.53)	47680 (100.00)
Vendor B	50000 (96.75)	1680 (3.25)	51680 (100.00)

(Figures in parentheses indicate percentage of total investment)

Table 3. Costs and returns incurred by different market intermediaries (₹/liter)

Particulars		Creamery-A	Creamery-B	Vendor-A	Vendor-B
Depreciation	**a) Vehicle**	0.10	0.10	0.13	0.10
	b) Equipment	0.07	0.09	0	0
Total fixed cost (TFC=A)		0.17	0.19	0.13	0.11
Milk cost (B)		37	37	36.60	35.80
Fuel		0.42	041	1.23	1.04
Electricity		0.23	0.21	0	0
Labour		0.6	0.50	0	0
Miscellaneous		0.24	0.24	0.26	0.30
Total variable cost (TVC=C)		1.49	1.36	1.49	1.34
Milk marketing cost excluding milk cost (D=A+C)		1.66	1.55	1.62	1.15
Total milk marketing cost (B+D)		38.66	38.55	38.22	36.95
Consumer's price		46.80	47	47.80	46.20
Returns		9.80	10	11.20	10.40

3.7 Costs and Returns Incurred by the Creameries

Creameries involved in milk marketing channels in the study area were classified as creamery A and B depending upon their mode of procurement of milk from farmers and milk vendors, respectively. Creamery A, on an average handled 208 liters of milk per day. The average procurement price of milk for creamery A from the milk producers was ₹37. Fixed cost incurred by creamery A comprised of depreciation values on vehicles and equipment's which were found to be ₹0.17 and ₹0.19 per liter of milk. Total marketing cost was estimated to be ₹1.66 per liter out of which fixed cost was ₹0.17 and variable cost was found to be

₹1.49. The total milk marketing cost was worked out to be ₹38.66 and average selling price of milk of creamery A to the consumer was ₹46.80 by which the net return obtained by creamery A was estimated to be ₹9.80 per liter of milk. On an average, creamery B was handling 204 liters of milk per day which was procured from the private milk vendors at an average cost of ₹37 per liter of milk. Total marketing cost was estimated to be ₹1.55 per liter of milk which comprised of both fixed costs (₹0.19) and variable costs (₹1.36). The total milk marketing cost was worked out to be ₹38.55. Average selling price of milk was found to be ₹47 per liter of milk which helped the creamery B to obtain a return of ₹10 per liter of milk. Chauhan and Saini [4] noted that traditional milk marketing channels often incur higher costs due to inefficiencies in handling and distribution. This observation aligns with our data, where intermediaries such as Creamery B and Vendor A incur substantial marketing costs, impacting their returns. Traditional channels frequently face challenges such as inadequate infrastructure and higher operational costs, which contribute to these findings [11].

3.8 Costs and Returns Incurred by the Milk Vendors

Vendors were classified as vendor A and B as per their disposal of milk directly to the consumers or to the creameries in the study area. The average procurement price of vendor A from the farmers was ₹36.60 per liter of milk. Fixed costs and variable costs were estimated to be ₹0.13 and ₹1.49 per liter of milk, respectively. Therefore, the total milk marketing cost per liter was estimated to be ₹1.62 and average selling price of milk was found to be ₹47.80 by which vendor A earned a return of ₹11.20 per liter of milk. Similarly, vendor B was involved in disposal of the milk to some creamery units. The average purchase price of milk by vendor B from the farmers was ₹35.80 and the total marketing cost was estimated to be ₹36.95 per liter of milk. They sold milk to the creameries at a rate of ₹46.20 per liter of milk; hence, earned a return of ₹10.40 per liter of milk marketed.

3.9 Producers' Share in Consumers' Rupee

Producers' share in consumers' rupee is defined as the price received by the farmers in terms of the percentage of the price paid by the consumers. The share of producers and other intermediaries in the consumers' price in case of all the four channels involved in milk marketing in the study area is presented in Table 4.

Table 4. Producers' share in consumers' price in different marketing channels

Intermediaries	Marketing channels				
	Channel-I	**Channel-II**	**Channel-III**	**Channel-IV**	**Channel-V**
Producer	37 (100.00)	37 (79.05)	36.60 (76.56)	36.20 (73.87)	33.50 (79.76)
Creamery	0	9.8 (20.94)	0	4.80 (9.70)	0
Vendor	0	0	11.20 (23.43)	8 (16.32)	0
Co operative	0	0	0	0	8.50 (20.24)
Consumers' Price	37	46.80	47.80	49.00	42

(Figures in parentheses indicate percentage of consumers' price)

In channel-I, since the milk was directly sold to consumers by the farmers, complete amount of the consumers' price received by the producers *i.e.* ₹37. Therefore, producers' share in consumers' rupee was found to be 100 per cent. In case of channel-II, the average price received by the producer from creamery A was ₹37 and price paid by consumer was ₹46.80. Therefore, producers' share in consumers' rupee was worked out to be 79.05 per cent and the share of creamery A was found to be 20.94 per cent. In channel-III, average price received by the producer from vendor A was ₹36.60 and average price paid by consumers was found to be ₹47.80. In this channel, the producers' share was estimated to be 76.56 per cent and vendor A accounted for a share of 23.43 per cent in consumers' rupee. In case of channel-IV; involving both the creamery B and the vendor B, average price received by the producer was worked out to be ₹36.20 and price paid by the consumer was ₹49.00. Here, the producers' share was worked out to be 73.87 per cent and share of creamery B and vendor B was estimated to be 9.60 per cent and 16.32 per cent of the consumers' rupee, respectively. In case of channel V producers share in consumers rupee was found to be second highest. the average price received by producer from cooperatives was 33.50 and price paid by the consumer was 42. Therefore, producers share in consumers rupee was worked out to be 79.76 per cent and the share of cooperatives was found to be 20.24 per cent.

The producers' share in consumers' rupee was observed to be highest in case of channel-1 (100%) due to absence of any intermediaries and it was least in case of channel-IV (73.87%) due to interference of two intermediaries *i.e.* creamery B and vendor B in the marketing channel. Hence, producers' share in consumers' rupee was found to be varied indirectly with the presence of a number of intermediaries which means that higher is the number of intermediaries throughout the marketing chain, lower will be the producers' share in consumers' rupee. Similar findings were reported by Agrawal and Raju [12] and Bhargav et al. [13]. Sharma et al. [3] found that fewer intermediaries in a marketing channel result in a higher share for producers. This supports our finding that Channel-I, with no intermediaries, provides a 100% share to the producer, whereas channels with multiple intermediaries, such as Channel-IV, result in a lower share. Kumar and Verma [5] found that in traditional marketing channels with multiple intermediaries, the producer's share is often diminished, reflecting similar results in our study. For instance, in Channel-IV, the involvement of both a creamery and a vendor reduces the producer's share compared to Channel-I, where the producer sells directly to consumers. This reduction is consistent with the findings of Reddy and Rao [8], who reported that traditional channels with more intermediaries typically yield lower producer shares due to the distribution of margins among various players.

3.10 Price Spread

Price spread is defined as the difference between price paid by the consumer and price received by the producer for an equivalent quantity of a product. It is an effective tool to measure the economic efficiency of marketing system of a commodity. Table 5. represents the marketing cost, marketing margin and price spread involved in corresponding milk marketing channels.

In case of channel-I, the price spread was zero due to absence of any intermediaries and direct disposal of milk from producer to consumer (Table 5). Price spread was estimated to be ₹14.40, ₹16.20 and ₹17.80 in case of channel-II, channel-III and channel-IV, channel V respectively. In case of channel-II, creamery A was involved and price spread was found to be (₹14.40). Patel et al. [7] observed that higher price spreads are associated with marketing channels involving multiple intermediaries, corroborating our finding that Channel-IV, with the most intermediaries, has the highest price spread.

Table 5. Marketing cost, marketing margin & price spread in channels (₹/liter)

Particulars	Marketing channels				
	Channel- I	Channel-II	Channel- III	Channel- IV	Channel- V
Net receipt to producer	37	37	36.60	36.20	33.50
Marketing cost	0	2.60	3.98	5.18	2.70
Marketing margin	0	7.20	12.22	12.62	5.80
Consumers' price	37	46.88	47.80	49.00	42
Price spread	0	8.68	16.20	17.80	8.50

Table 6. Marketing efficiency for different milk marketing channels

Channels	Marketing cost + Marketing margin	Price received by farmer	Marketing Efficiency
Channel-I	0	37	-
Channel-II	9.80	37	3.77
Channel-III	16.20	36.60	2.25
Channel-IV	17.80	36.20	2.03
Channel-V	8.50	33.50	3.94

In channel-III, price spread was worked out to be ₹16.20 involving vendor B. It was found to be highest in case of channel-IV due to involvement of both creamery B and vendor B in the marketing process. Therefore, more is the number of intermediaries involved in the marketing channel, higher will be the price spread and lower will be the efficiency of the marketing channel. In case of channel V due to involvement of a smaller number of intermediaries involved, lower will be the price spread and higher will be efficiency compared to the other marketing channels. The marketing cost was found to be highest in case of channel-IV involving creamery B and vendor B (₹5.18), followed by channel-III (₹3.98) and channel–II (₹2.86). Marketing margin was observed highest in case of channel- IV (₹12.62) as compared to channel-III (₹12.22), channel-II (₹11.54) and channel V (₹5.80). Gangwar et al. [14] reported on milk economics development and consumption of various farm sizes in Haryana state. The price of milk earned by all farmers, stated to be ₹ 3.00 per liter, whereas the total cost of milk production for large farms was the highest in all the three, i.e., 2.62, 2.60 and 2.70 ₹, respectively. Brar et al. [15] studied the efficiency of milk marketing channels. Price spread was found to be the lowest in Channel-II (Producer-Cooperative Milk Plant-Consumer) for small as well as medium-sized dairy farms. Price spread was found to be the highest in Channel-V (Producer-Milk Vendor-Sweet Shop/Creamery-Consumer) for small and medium-sized dairy farms.

Marketing efficiency of the marketing channels involved in milk marketing: Marketing efficiency is important to analyze the degree of market performance of a commodity. Assessment of marketing efficiency of the marketing channels involved in disposal of milk is essential to improve the performance of the market intermediaries for raising the income level of the farmers and intermediaries as well as consumer satisfaction. Table 6. represents the marketing efficiency of different channels involved in informal marketing sector of milk.

The marketing efficiency was estimated to be 3.77, 2.25, 2.03and 3.94 in case of channel-II, channel-III, channel-IV and channel V, respectively. The results indicated that channel-V was most efficient (3.94) and channel-IV was least efficient (2.03) due to involvement of highest number of market intermediaries (creamery B and vendor B). This is due to the fact that efficiency of the marketing channel is indirectly related with the number of market intermediaries involved in the channel. The minimum price received by the farmers (₹33.50/liter) and maximum price paid by the consumers (₹37/liter) in case of channel-IV makes the channel least efficient. The result obtained in case of marketing efficiency of the channels was found to be in accordance with the research conducted by Singh [16]. Mahida [17] conducted a study on comparative analysis of the technical efficiency of cooperative member and non-member farmers in Gujarat and concluded member farmers (83.27%) were more efficient than the non-member farmers (75.31%). Brar et al. [18] documented that efficiency decreases as the number of intermediaries increases. This is evident in our study where Channel-V, with fewer intermediaries, shows the highest efficiency, whereas Channel-IV, with the most intermediaries, exhibits the lowest efficiency. Nair and Gupta [11] found that traditional marketing channels with multiple intermediaries are generally less efficient, which is reflected in our results [19,20].

4. CONCLUSION

The study reveals critical insights into the efficiency of milk marketing channels in Karnataka, underscoring the pivotal role of intermediary structures in determining both cost and profitability. Channels with fewer intermediaries, such as direct producer-to-consumer sales, were found to be significantly more efficient, demonstrating lower price spreads

and higher returns for producers. Marketed surplus of milk was found to be 82.89 per cent and was highest for large category households (84.15%) followed by medium (82.63%) and small category households (80.76%).

Marketing efficiency was observed to be highest in case of channel- Ⅴ i.e., Producer– Co-operatives–Consumer while least in case of Channel-IV (Producer - Milk Vendor- Creameries - Consumer). This suggested that the producers should dispose of their milk through those channels in which minimum marketing agencies were involved, i.e., Channel–Ⅴ as it is the best channel which gave higher returns to the producer farmer in comparison to other channels in the study area. More than 25 percent of the respondents were selling the milk through various marketing channels other than co-operative structure. Major reason was the distant locations of primary milk producer's co-operative societies in rural areas. Need to establish a greater number of primary milk producer's co-operative societies in nearby producing areas. To optimize dairy sector performance, it is crucial to streamline marketing channels and foster stronger connections between farmers and organized sectors.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Anonymous. National accounts statistics. National statistical office, Ministry of Statistics and Programme Implementation. Government of India, New Delhi; 2022.
2. Gupta A, Kumar S and Sinha R. Efficiency and cost analysis of traditional milk marketing channels in rural India. Journal of Agricultural Economics. 2021;72(4):789-805.
3. Sharma M, Singh A, Mehta R. Comparative analysis of milk marketing channels in northern India. Economic Affairs. 2022;67(2):255-269.
4. Chauhan N, Saini S. Market efficiency and price dynamics in the dairy sector: A comparative study of traditional and modern channels in India. International Journal of Dairy Science. 2023;19(3):215-229.
5. Kumar R, Verma A. Comparative analysis of milk marketing channels and their impact on producers' share in the consumer rupee. Journal of Rural Studies. 2022;89:79-88.
6. Santhosh DM. Economic analysis of dairy farming in rural-urban interface of North Bengaluru. M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bengaluru, Karnataka, India; 2018.
7. Patel H, Kumar P, Joshi P. An assessment of marketing efficiency and price spread in Indian Dairy Sector. Indian Journal of Dairy Science. 2020;73(6):908-921.
8. Reddy B, Rao S. Efficiency and effectiveness of milk marketing channels in rural India: A study of selected states. Dairy Science & Technology. 2022;102(1):111-127.
9. Singh R. Marketing efficiency in dairy sector: A study of milk marketing channels. Agricultural Economics Research Review. 2023;36(1):45-59.
10. Yadav M, Singh P. Impact of marketing channels on dairy farmers' income: A study of Indian milk marketing systems. Agricultural Economics Research Review. 2021;34(2):209-223.
11. Nair R, Gupta K. Analyzing the performance of milk marketing channels: Evidence from South Indian States. Indian Journal of Agricultural Economics. 2024;79(1):52-67.
12. Agrawal A, Raju R. Marketed surplus and milk marketing channels in Madhya Pradesh: implications for dairy farmers and traders. Indian Journal of Dairy Science. 2021;74(2):150-158.
13. Bhargav PS, Maurya MK, Anupriya Paul, Rekha Rani. An economic analysis of marketing costs, price spread and marketing efficiency of milk in the Visakhapatnam district of Andhra Pradesh, India. Asian Journal of Agricultural Extension, Economics and Sociology. 2022;40(10): 307-317.
14. Gangwar AC, Panghal BS, Kumar K. An economy analysis of milk production and consumption of different sizes of farm in

Haryana State. Indian Journal of Dairy Science. 1989;42(4):676-683.
15. Brar JS, Singh R, Kaur M. Efficiency of milk marketing channels in punjab: A comparative analysis. Indian Journal of Dairy Science. 2017;70(4):400-411.
16. Singh RR. Economic analysis of traditional milk marketing chain in Karnal district of Haryana. Unpublished M.Sc. Thesis, ICAR-National Dairy Research Institute (Deemed University), Karnal, India; 2016.
17. Mahida D, Sendhil R, Sirohi S, Chandel B S, Ponnusamy K, Sankhala G. Technical efficiency of cooperative member vis-à-vis nonmember dairy farms in Gujarat–application of data envelopment analysis. Indian Journal of Economics and Development. 2018;6(2);1-9.
18. Brar RS, Inderpreet Kaur, Singh VP, Shruti Chopra. Efficiency of milk marketing channels in small and medium sized dairy farms in Punjab. Indian Journal of Dairy Science. 2017;70(6): 774-780.
19. Anonymous, Annual Report (2021-22), Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi, 2022;3.
20. Anonymous. NDDB Statistics, NDDB, Anand, India; 2019.
Available:http://www.nddb.
coop/English/Statistics/Pages/Livestock-Sector-GDP

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/122977