



Review paper

# Assessments of Milk Marketing Channels and Marketing Efficiency

## A Case Study of Ghazipur District, Uttar Pradesh

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| KEYWORDS                                                                                                                      | ABSTRACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| milk marketing<br>marketing channels<br>price spread<br>producer's share<br>marketing efficiency<br>Ghazipur<br>Uttar Pradesh | The dairy sector is a cornerstone of the rural economy in Uttar Pradesh, yet a significant portion of milk is marketed through informal, inefficient channels that reduce farmers' income. This study analyzes the structure, efficiency, and constraints of milk marketing channels in Ghazipur district. A multistage sampling technique was employed to collect primary data from 100 dairy farmers and various market intermediaries (private collection centres, vendors, halwais). The study employed Garrett's ranking for constraint analysis and calculated price spread, producer's share, and marketing efficiency. Findings reveal that only 44.06% of the marketed surplus is sold through organized channels, with the rest (55.94%) dominated by local vendors and halwais. The producer's share in the consumer's rupee decreases significantly with an increase in intermediaries, from 100% in direct sales to 61.38% in the longest channel. Marketing efficiency, measured by the modified measure, was highest for the producer-halwai-consumer channel (3.51) and lowest for channels involving multiple intermediaries (1.58). Major constraints include the high price of concentrates, low availability of green fodder, and irregular payments. The study concludes that strengthening formal market linkages, promoting Farmer Producer Organizations (FPOs), and investing in cold chain infrastructure are crucial to enhancing marketing efficiency and ensuring equitable returns for dairy farmers in Ghazipur. |

### 1. Introduction

According World Milk Day was started in 2001 by the Food and Agriculture Organization (FAO) of the United Nations to acknowledge the importance of milk as a global food and to celebrate the dairy sector's contributions to nutrition, economic development, and sustainable agriculture. The official World Milk Day 2025 Theme is "Let's Celebrate the Power of Dairy." This theme mentions dairy's important role in promoting nutrition, supporting livelihoods, and fostering sustainable food systems. This theme also highlights how dairy contributes to stronger communities, healthier lives, and a more sustainable future. Total milk production in the



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country is 247.87 million tonnes during 2024-25. India ranks 1st in the world in terms of total milk production. (Source: FAO). The milk production has increased by 3.58% over the previous year (FAO2024-25). The per-capita availability of milk is 485 grams per day

In India, Uttar Pradesh (UP) largest milk-producing state, contributing approximately 16% to the national output. Despite its prominence, the dairy sector remains predominantly unorganized, with only 20-25% of milk processed formally (NDDDB, 2023). Ghazipur district in eastern UP is a key dairy hub, where over 60% of rural households depend on livestock, and buffaloes contribute 70% of the milk output. However, farmers often face exploitation through price manipulation by middlemen in unregulated markets, highlighting a critical need to analyze and improve marketing efficiency.) Carried out their research on economics of milk production and marketing in the milk shed area of Dhenkanal cooperative milk producer's union, Odisha

Behera et al. (2019). Studied the economics of milk production in Varanasi district of Uttar Pradesh and reported that out of the total milk produced, marketed surplus accounted for 54 per cent and the rest 46 per cent was for domestic consumption. The marketed surplus of milk was disposed off through various marketing channels including milk vendors (64%), tea stalls & halwai (33%), directly to the consumers (2%) and nearly 1 per cent of milk was sold through MPCs Primary Milk Producer Co-operative Societies) (Singh, 2008). Reported on small holder dairy farmer's access to modern milk marketing channels in Bihar concluded that 49.3 per cent of total milk produced was marketed while 50.7 per cent of milk was being retained for domestic consumption, out of which about 21 per cent of marketed milk was sold directly to the consumers (Kumar et al. 2011). Conducted a study on economic analysis of traditional milk marketing chain in Karnal, Haryana and reported that out of the total marketed surplus of milk, marketing of 91.83 per cent of milk was carried out through the unorganized traditional marketing sector, whereas remaining 8.17 per cent of marketed surplus was disposed off through the (Singh, 2013). Conducted a study on the economic study of milk supply chain in Kolar Milk Union (KOMUL) in Karnataka and reported that the cost of milk production for crossbred cow and buffalo was 18.78 and 28.77, respectively. Share of feed cost in total cost varied from 65 per cent in buffaloes to 69 per cent in crossbred cows. The net return was negative for buffaloes (2.77/lit) while for crossbred cows, it was positive (5.21/litre). (Manjunatha et al. 2016) Review literature Documented socio-economic constraints in milk marketing across Ghazipur and Varanasi. Findings suggest middlemen exploit producers due to lack of cooperative societies. Shukla & Singh (2017) The aim of Indian government to Policy Urgency Aligns with UP's goal to double farming income of dairy farmers by 2027 through dairy intensification. NDDDB (2023), UP (Economic Survey 2022-23), NITI Aayog (2024), (Ghazipur AH Office Surveys 2024). Analyzed the value chain of liquid milk in Bengaluru milk union of Karnataka, and concluded that Bengaluru Milk Union Ltd. (Bamul) provides several inputs like balanced cattle feed and mineral mixtures to the farmers along with distribution of fodder seeds at subsidized prices for green fodder and dry fodder production. It also provides different animal health care services like health check-up camps, vaccination, emergency veterinary routes, artificial insemination services at affordable charges. She also used Garrett's ranking. Technique for analyzing various constraints faced by the farmers in getting input and services and reported that higher transportation charges incurred in purchasing the feed was found to be the major constraint with a Garrett means score of 83.41, followed by delay in input delivery with a mean score of 59.4. (Vanishree et al. 2018) Studied dairy cooperatives in eastern UP and noted that 60% of farmers faced delays in accessing mineral mixtures and vaccines, leading to a 12-18% decline in milk yield. They recommended mobile veterinary units to bridge gaps (Singh and Patel, 2021). Dastagiri et al. (2023) noted that 20% of milk in Ghazipur district is spoiled annually due to lack of cold storage, urging investments in mini-dairy plants under the PM Formalization of Micro Food Enterprises (PM-FME) scheme. According to the UP Dairy Development Policy (2022), only 10% of milk produced in the state is currently processed, which is far below potential. The policy targets an increase in processing to 25% and promotes private investment in milk-based enterprises to encourage value addition. NSSO 81st Round (2023) reported that 48% of milk in rural UP is retained for household use, primarily as liquid milk (65%), curd (25%), and ghee (10%). Ghazipur's per capita consumption (214 ml/day) lags behind the state average (240 ml/day). Gautam et al. (2023) studied dairy households in Jaunpur (adjacent to Ghazipur). Most farmers were unable to afford improved breeds; average milk yield remained <5 litres/day. Kushwaha & Kumar (2024) provide the most specific recent study for your thesis. They focus on milk production economics in Ghazipur, including costs, returns, marketing barriers, and gender roles in dairy. This review targets current trends (post-COVID inflation, digital interventions) and \*\*region-specific challenges\*\* (fodder scarcity, low AI adoption). For Ghazipur, primary surveys on FPOs and climate adaptation strategies are recommended to fill data gaps.

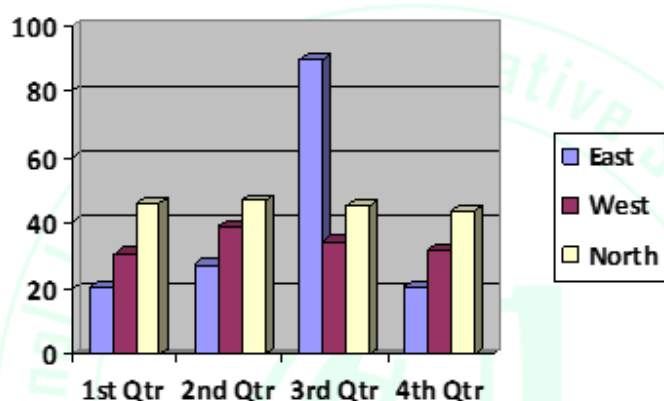
The marketing channel is the pathway through which a goods moves from producers to consumers. Its efficiency directly impacts the price received by the producer and the price paid by the consumer. Understanding the structure, costs, margins, and efficiency of these channels is essential for formulating

policies that enhance farmers' profitability. This paper aims to fill this gap by conducting a detailed economic analysis of milk marketing channels in Ghazipur district, with the following objectives:

1. To identify the prevalent milk marketing channels and their structure.
2. To analyze the price spread and producer's share in the consumer's rupee across different channels.
3. To estimate the marketing efficiency of various channels, constraints and policies suggestions in the sample farms.

Here is the List of Milk-Producing Countries in the World 2025;

| Rank | Country       | Production in Million Tonnes |
|------|---------------|------------------------------|
| 1    | India         | 208,984,430                  |
| 2    | United States | 102,654,616                  |
| 3    | Pakistan      | 65,785,000                   |
| 4    | China         | 41,245,664                   |
| 5    | Brazil        | 36,663,708                   |
| 6    | Germany       | 33,188,890                   |
| 7    | Russia        | 32,333,278                   |
| 8    | France        | 25,834,800                   |
| 9    | Turkey        | 23,200,306                   |
| 10   | New Zealand   | 21,886,376                   |



## 2. Materisl and Methods

The present study was conducted in Ghazipur district of Uttar Pradesh selected purposively for study with using multi stage sampling method to selecting respondents. Among the 16 milk producing blocks, Saidpur block (a higher producing block) was selected for respondent to conduct a study research. Three villages in Saidpur block were selected for this study and thus Three villages namely Khanpur, Faridaha, Belhari were selected randomly, finally a list of 100 farmers was prepared based on their farm sizes. By Using the cumulative square root frequency method, these were stratified into 66 marginal and 34 small herd size categories. For complete analysis of price spread and marketing efficiency: Additionally, market intermediaries including private milk collection centres, vendors, and halwais were surveyed.

### 2.1 Data Collection and Analysis

Primary data was collected through personal interviews using a well-structured schedule as well as the secondary data was obtained through government district Department of Animal Husbandry, NDDB, and other published research journals.

### 2.2 Analytical frameworks

*Estimation of marketed surplus:* Marketed surplus is the part of produce which is actually brought to the market for sale. Hence, marketed surplus is the quantity of produce which the producer actually sells in the market, after meeting family consumption requirements, farm needs and other payments due. The actual quantity of milk sold per household per day was considered as the marketed surplus.

$$\text{Marketed surplus of milk} = \text{total milk production} - \text{total milk consumption}$$

Total milk production of the household is the total milk produced by all the milch animals per day. Total milk consumption consists of the quantity of milk retained at home for consumption as raw milk or converting into other dairy products.

### 2.3 Marketed surplus of milk

Following formula were used for calculating marketed surplus

Specification of Marketed Surplus Function

$$Y=f(X_1,X_2,X_3,X_4,X_5,X_6)$$

where,

- Y = the marketed surplus of milk (litre/day)
- X<sub>1</sub> = the family size (numbers)
- X<sub>2</sub> = the operational land holding of farmer (acres)
- X<sub>3</sub> = the herd size (numbers)
- X<sub>4</sub> = the price of milk received by farmer (/litre)
- X<sub>5</sub> = the education level of farmer (scores)
- X<sub>6</sub> = the experience of farmer in dairying (years)

#### Marketed Surplus

Calculated as 'Total Milk Production - Household Consumption.

**Price Spread:** The difference between the consumer's purchase price and the net price received by the producer.

$$(P_s = P_c - P_p)$$

**Producer's Share in Consumer's Rupee:** it deals with the price received by milk farmer and price paid by consumer expressed as a percentage of retail prices. Producer's share in consumer's rupee  $P_s$  was calculated by using following formula (Acharya and Agrawal, 2005)

$$P_s = (P_f / P_r) \times 100$$

Where,

- $P_s$  = Producer's Share in Consumer's Rupee
- $P_f$  = Producer price received by milk producer
- $P_r$  = Retail price (price paid by consumer)

**Marketing Efficiency:** Estimated using Acharya's Modified Formula:

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

Where

'FP' is the price received by the milk producer,

'MC' is the marketing cost, and

'MM' is the marketing margin

## 3. Result and Discussion

### 3.1 Milk marketing Pattern

#### Marketing Channels

Marketing channel consists of a number of intermediaries through which various commodities are transferred from producer to consumer. Likewise in the study region, specific intermediaries are involved in milk marketing such as private collection centers, milk vendors etc. The followings five active informal different milk marketing channels were found in the study areas.

Of raw milk handled by intermediaries: the process of studying the milk marketing channels, processes and planning use to get milk from producer to consumer and how milk sold directly to consumer through middlemen or processed into products for retail sale. very distinguish channels were seen in the district, milk producer sold to middlemen as Collection centre, Vender, and Halwai etc. and consumers, The sample taken from 35 consumers, 18 private collections centres 20 vendors and 17 halwais. Especially five active marketing channels were identified in study region which are given blow.

1. Channel-I: Producer → Consumer



2. Channel-II: Producer → Private Collection Centre → Consumer
3. Channel-III: Producer → Vendor → Consumer
4. Channel-IV: Producer → Vendor → Halwai → Consumer
5. Channel-V: Producer → Halwai → Consumer

**In channel 1;** Through this channel, sample respondents sold their milk directly to the village consumer and received higher prices per litre of milk on fortnightly basis; but **In the channel 2;** its observed that due to higher quantity production of milk sampled respondents were sold to private collection centre and they have got money by weekly whereas in **III and IV channel** consumers and vender involvement directly seen and they were sold of his milk low prices because family expenditure needs. In onward **channel V** was more attractive suitable for sampled respondents because of obtained money per litre in regular evening time by halwai milk purchasers. In out of the total production, marketed surplus (11.78 litres/household/day), a majority (55.94%) was disposed of through the unorganized sector (vendors and halwais), while only 44.06% was marketed through organized channels (private collection centres). Marginal farmers relied more heavily on the unorganized sector (66.93% of their surplus) compared to small farmers (52.16%), who had better access to formal channels.

Milk, being perishable, has every short shelf life in its unprocessed form. Consequently, it must be either sold or transformed into various dairy products without delay. Marketed surplus refers to the actual volume of milk offered for sale in the market, after satisfying the household's own consumption needs. Therefore, it is essential to ascertain the contribution and dominant share in the marketed surplus of milk by farmers across different herd size categories within the Ghazipur district of Uttar Pradesh. Among the various determinants influencing the marketed surplus of milk, herd size, household size, operational and holding, milk price, educational attainment of the household head, and the farmer's experience in dairying were considered for this study.

In the subsequent section, data pertaining to household milk consumption and marketed surplus in Ghazipur, factors impacting marketed surplus, milk disposal patterns through various marketing channels, and the marketing efficiency of traditional channels involved in milk distribution to end-users will be presented and discussed.

### 3.2 Average daily production and consumption level of milk in selected area:

Table 1 illustrates the average daily milk yield, household consumption, and marketed surplus of milk for different categories of farming households. It is clear from the table that the average milk yield was 8.50 and 21.20 litres per household per day for marginal and small herd sizes, respectively. The overall average milk yield was 14.85 litres. The overall household consumption of milk was calculated to be 3.07 litres per day, which varied from 2.36 litres per day (marginal herd size farmers) to 3.79 litres per day (small herd size farmers). As the table shows, the family's size positively correlates with the average household consumption. The overall average marketed surplus was estimated at 11.78 litres, varying from 6.14 litres (marginal herd size farmers) to 17.41 litres (small herd size farmers). The overall share of the marketed surplus of milk was found to be 79.32% of the total milk yield. The share of the marketed surplus in total milk yield showed an increasing trend with the herd size, being lowest for the marginal herd size category (72.23%) and highest in the case of the small herd size category (82.12%). Therefore, it is concluded that farmers of all categories in the study region consume a small portion of large quintiles used for consumption and remaining the milk being sold through various milk marketing channels.

**Table 1** Average daily milk production and marketed surplus (litre/household/day)

| Herd size | Average milk production (litre/day) | Family consumption (litre/day) | Average marketed surplus (litre/day) | Marketed surplus as percentage of household milk production |
|-----------|-------------------------------------|--------------------------------|--------------------------------------|-------------------------------------------------------------|
| Marginal  | 8.50                                | 2.36                           | 6.14                                 | 72.23                                                       |
| Small     | 21.20                               | 3.79                           | 17.41                                | 82.12                                                       |
| Overall   | 14.85                               | 3.07                           | 11.78                                | 79.32                                                       |

### 3.3 Marketing Channel and Price Spread

#### 3.3.1 Disposal pattern of milk:

Milk, being a highly perishable commodity, requires an efficient marketing channel for its effective disposal. In the study region, both organized and unorganized sectors were involved in the milk disposal process. The unorganized sector includes vendors and halwais. In contrast, milk disposal in the organized sector takes place

through private collection centers. The disposal pattern of milk through these various channels is presented in Table 3. The table indicates that overall marketed surplus of all farms of milk, is disposed as 100 percent (11.78 litre) in which the major portion 55.94 (5.59 litre) per cent was disposed of through the unorganized sector, while the remaining 43.88 per cent (5.17 litre) was milk marketed through the organized sector.

**Table 2** Disposal pattern of milk through market intermediaries (litre/day)

| Category | Unorganized sector |                 |                 |                 | Organized sector          | Marketed Surplus |
|----------|--------------------|-----------------|-----------------|-----------------|---------------------------|------------------|
|          | Consumer           | Vendor          | Halwai          | Total           | Private collection centre |                  |
| Marginal | 1.15<br>(18.81)    | 2.24<br>(36.49) | 0.71<br>(11.63) | 4.10<br>(66.93) | 2.03<br>(33.07)           | 6.14<br>(100.0)  |
| Small    | 2.39<br>(13.78)    | 4.32<br>(24.86) | 2.35<br>(13.52) | 9.08<br>(52.16) | 8.32<br>(47.84)           | 17.41<br>(100.0) |
| Overall  | 1.77<br>(15.02)    | 3.28<br>(24.84) | 1.53<br>(12.98) | 6.59<br>(55.94) | 5.17<br>(43.88)           | 11.78<br>(100.0) |

### 3.3.2 Price Spread and Producer's Share in consumer Rupee in selected region

#### Milk marketing channels

The analysis of price spread and producer's share in consumer rupee revealed the economic burden of intermediaries. During survey period, data was collected through market intermediaries who were received milk from various milk producers' farmers. The average daily quantity of raw milk presented in the table 1. depicted from table that the private collection centre B were receiving large quantities of milk as if 224 litres was being purchased every day and same way private collection centre A was received 145 litres on average every of day Milk where as milk vendor handled 42 litres, and Halwai also was buying 68 litres of milk on daily basis respectively.

**Table 3** Average quantity of milk handled by different market intermediaries in the study area

| Market intermediaries       | Average quantity of milk received /day |
|-----------------------------|----------------------------------------|
| Private collection centre A | 145                                    |
| Private collection centre B | 224                                    |
| Milk vender                 | 42                                     |
| Halwai                      | 68                                     |

### 3.3.3 Investment pattern of various market intermediaries

The capital required for a dairy operation is influenced by different factors such as initial and operational funds, the scale of activity, the specific type of business undertaken by various market intermediaries, and the diverse equipment employed. The average initial investments made by different market intermediaries are detailed in Table 2. It clear from table that private collection centre A incurred an average total initial investment of Rs. 10087 per month, comprising Rs. 7140 (70.78%) for vehicles and Rs. 2947 (29.22%) for equipment. Private collection centre B had a total average initial investment of Rs. 14455 per month, with Rs. 6972 (48.23%) allocated to vehicles and Rs. 7483 (51.77%) to equipment. Further though milk vendor's total average initial investment was found Rs. 7370, of which per month, Rs. 5264 (71.42%) was for the vehicles and Rs. 2106 (28.58%) was for equipment expenses. Lastly, in the process, Halwai recorded a total average initial investment was Rs. 9555 per month, with Rs. 4683 (61.98%) for vehicles and Rs. 2872 (38.02%) for equipment.

**Table 4** Average initial investment by market intermediaries (per month)

| Particulars                 | Investment (In Rs.) |              | Total (In Rs.) |
|-----------------------------|---------------------|--------------|----------------|
|                             | Vehicle             | Equipment    |                |
| Private collection Centre A | 7140 (70.78)        | 2947 (29.22) | 10087 (100.0)  |
| Private collection Centre B | 6972 (48.23)        | 7483 (51.77) | 14455. (100.0) |
| Milk Vendor                 | 5264 (71.42)        | 2106 (28.58) | 7370. (100.0)  |
| Halwai                      | 4683 (61.98)        | 2872 (38.02) | 9555 (100.0)   |

Figures in parenthesis indicate the percentage to total investment of market intermediaries

**Table 5** Producer's share in consumers 'rupee per litre in the study area

| Intermediaries              | Marketing channel |               |               |               |               |
|-----------------------------|-------------------|---------------|---------------|---------------|---------------|
|                             | Channel I         | Channel II    | Channel III   | Channel IV    | Channel V     |
| Producers                   | 49.78(100.00)     | -             | 39.32(77.86)  | 37.20(69.66)  | 35.91(61.38)  |
| Halwai                      | -                 | 42.35(100.00) | 11.18(22.14)  | -             | 8.64(14.77)   |
| Vender / market milk seller | -                 | -             | -             | 16.20(30.34)  | 13.95(23.85)  |
| Consumer price              | 49.78(100.00)     | 42.35(100.00) | 50.50(100.00) | 53.40(100.00) | 58.50(100.00) |

Figures in parenthesis shows the percentage of milk in rupee per liter

The producer's share in the consumer's price is defined as the percentage of the final price paid by consumers that is received by the farmers presented in Table 5 illustrated that the share of producers and various intermediaries in the consumer's price in rupee across the village of milk marketing channels observed in the study area. It is cleared from table that **In Channel-I**, where milk was directly sold by farmers to consumers, the producer received the entire consumer price of Rs. 44.78. Consequently, the producer's share in the consumer's rupee was found to be 100 percent. For **Channel-II it involved**, the producer's share in the consumer's rupee was calculated as Rs. 42.35 percent which was also observed 100 percent . in continuations channels III total Rupees per liter was Rs.50.50 which is constituted Rs. 39.32(77.86 per cent) producer and Rs. 11.78 (per cent)Halwai In **Channel-IV**, the producer's share was estimated at 69.66 percent (from Rs. 37.20, with the consumer paying Rs. 53.40), and the Vendor/market milk seller accounted for a share of 30.34 percent (Rs. 16.20) in the consumer's rupee. Finally, in Channel-V, it involved both a Halwai and Vendor/market milk seller, the producer's share was determined to be 61.38 percent (from Rs. 35.91, against a consumer price of Rs. 58.50). further in this channel, the Halwai's share was 14.77 percent (Rs. 8.64), and the Vendor/market milk seller's share was 23.85 percent (Rs. 13.95) of the consumer's rupee was obtained .The producer's share in the consumer's rupee was highest observed in Channel-I (100%), attributed to the absence of intermediaries. Conversely, it was lowest in Channel-IV (61.38%), due to the involvement of two intermediaries, namely the Halwai and the Vendor/market milk seller in the marketing channel. This pattern indicates that the produce's share in the consumer's rupee is inversely related to the number of intermediaries present; generally, a greater number of intermediaries along the marketing chain results in a reduced share for the producer.

### 3.4 Price spread

Price spread is defined as the difference between the price paid by the consumer and the net price received by the producer for an equivalent quantity of a product. It serves as an effective metric to assess the economic efficiency of a commodity's marketing system.

Table 6 Illustrates that the marketing cost, marketing margin, and price spread across various marketing channels.In Channel-I, the total price spread was determined to be Rs. zero. This channel involved direct sold from the producer to the consumer, where the producer's net price receipt was Rs.49.78, and the consumer price was same to Rs. 45.78 because not interferences of intermediaries where in channel II,III,IV and V Rs. 2.25 Rs. 11.18 Rs. 16.20, and Rs.22.59 were found respectively .. Specifically, in Channel-V the more price spread was came to Rs.22.59. Comparatively the net price received by producers in channel I were high seen as compared to channel first and further in channel fifth due to occurrences of intermediaries, the result is that the milk produces suffers significance loss.

**Table 6** Marketing cost, marketing margin and price spread

| Particulars                                             | Marketing channel |            |            |            |           |
|---------------------------------------------------------|-------------------|------------|------------|------------|-----------|
|                                                         | Channel-I         | Channel-II | Channe-III | Channel-IV | Channel-V |
| Net price received by Producer                          | 49.78             | 43.35      | 39.32      | 37.20      | 35.91     |
| Marketing cost Incurred by producers                    | -                 | 2.25       | 3.37       | 5.16       | 7.46      |
| Marketing margin/Net Profit received by intermediaries' | --                | -          | 7.81       | 11.04      | 15.13     |
| Consumer price                                          | 49.78             | 45.60      | 50.50      | 53.40      | 58.50     |
| Total Price spread                                      | 0.00              | 2.25       | 11.18      | 16.20      | 22.59     |

Channel-III showed a price spread of Rs. 16.20. The price spread was highest in Channel- IV, reaching Rs. 22.59.From this data, it can be concluded that a greater number of intermediaries involved in a marketing channel generally leads to a higher price spread and, consequently, lower efficiency of that marketing channel.

Regarding marketing costs, the highest marketing cost incurred by producers was observed in Channel-IV, at Rs. 7.46, followed by Channel-III (Rs. 5.16), Channel-I (Rs. 5.00), and Channel-II (Rs. 3.37). Correspondingly, the marketing margin (net profit received by intermediaries) was highest in Channel-IV, amounting to Rs. 15.13. This was followed by Channel-III with a margin of Rs. 11.04, and Channel-II with Rs. 7.81. Channel-I showed no marketing margin for intermediaries as it involved direct producer-to-consumer sales.

### 3.5 Marketing Efficiency

The milk marketing efficiency of different stock holders were calculated and presented in Table 7 the table shows that the Channel-I was the most efficient its value came to 49.78 because of usually most of milk buyer related to village they would have come to producer house to buy milk hence the stated value of milk marketing cost was zero. and other all among channel- such as II.III.IV and V the value of marketing efficiency were calculated 19.27,3.51,2.29 and 1.58 respectively and seen that channel V was less profitable their values was lowest came to 1.58, it may be concluded that that milk marketing efficiency decreases with an increases with more the number of intermediaries.

**Table 7** Marketing efficiency of different milk marketing channels in the study regions

| Channels    | Price received by farmer/ Consumer purchase price (Rs./litre) | Price Spread (Marketing cost + marketing margin(Rs./litre) | Marketing efficiency |
|-------------|---------------------------------------------------------------|------------------------------------------------------------|----------------------|
| Channel-I   | 49.78                                                         | NILL                                                       | 49.78                |
| Channel-II  | 43.35                                                         | 2.25                                                       | 19.27                |
| Channel-III | 39.32                                                         | 11.18                                                      | 3.51                 |
| Channel-IV  | 37.20                                                         | 16.20                                                      | 2.29                 |
| Channel-V   | 35.91                                                         | 22.59                                                      | 1.58                 |

### 3.6 Constraints faced by the dairy farmers during milk production

The challenges encountered by dairy producers during milk generation are outlined presented in Table 8 It is evident that the remote placement of semen collection facilities, elevated costs of concentrates, inferior quality of concentrates, and the absence of accessible subsidized feed constituted the primary production-related impediments for the farmers.

**Table 8** Constraints faced by the dairy farmers during milk production

| S.N. | Particulars                                      | Garrettmean score | Rank |
|------|--------------------------------------------------|-------------------|------|
| 1    | High price of concentrate                        | 68.45             | 1    |
| 2    | Low availability of green fodder                 | 67.18             | 2    |
| 3    | Irregular payment by milk procurement agencies   | 66.90             | 3    |
| 4    | Non availability of subsidized feed              | 65.70             | 4    |
| 5    | Distance to veterinary services/ AI centres      | 64.20             | 5    |
| 6    | Poor quality of concentrates                     | 63.33             | 6    |
| 7    | High transportation charges for feed/ fodder     | 55.76             | 7    |
| 8    | Non-remunerative price of milk                   | 49.12             | 8    |
| 9    | Lack of cold storage facilities                  | 43.87             | 9    |
| 10   | Inadequate artificial insemination (AI) services | 38.25             | 10   |

Nevertheless, aspects such as insufficient veterinary amenities, steep transport expenses, and unprofitably low milk prices were deemed of lesser consequence. The scarcity of green fodder was identified as the least significant concern, evidenced by a Garrett mean score of 32.50 attributed to the abundant yield and accessibility of green fodder varieties like berseem, cowpea, and fodder maize in the region under study.

### 4. Suggestions and Policy Implications:

- ❖ For small and marginal dairy farmers, adopting the following practices could improve profitability and sustainability:
- ❖ **Improve Feed Management:** Since feed constitutes over 70% of the total production cost, farmers should focus on using Total Mixed Ration (TMR), as this practice is associated with higher profit margins. It is also advisable to adopt drought-tolerant fodder varieties like Bajra Napier hybrids to mitigate the effects of summer fodder scarcity and increase yield.



- ❖ **Join Farmer Producer Organizations (FPOs):** Joining an FPO can reduce production costs by as much as 18% through the collective purchase of feed and other inputs. These organizations can also provide collective access to services like artificial insemination.
- ❖ **Leverage Digital Tools:** Farmers can improve their price realization by up to 20% by using digital platforms like WhatsApp for market linkages to bypass intermediaries and get better prices for their milk.
- ❖ **Utilize Government Schemes:** Farmers should take advantage of government initiatives like the Kisan Credit Card (KCC) Scheme to access loans at a low interest rate of 4%, which can significantly reduce their dependence on high-interest informal lenders (24–30%).

### **Policy Implications**

- ❖ To support the dairy sector in the Ghazipur district and align with the goal of doubling farmers' income, the following policy interventions are recommended:
- ❖ **Strengthen Formal Milk Marketing Channels:** Only 15% of the milk in the district is currently sold to formal channels, with the majority going to local vendors and intermediaries. The government should invest in establishing more chilling centers, as the study shows that for every kilometer of distance, a farmer's likelihood of selling to a cooperative drops by 8%.
- ❖ **Promote Farmer Producer Organizations (FPOs):** Policy makers should actively promote the formation and membership of FPOs to encourage collective-bargaining and bulk purchasing of inputs, which directly addresses the high cost of production faced by smallholders.
- ❖ **Enhance Veterinary and Input Infrastructure:** Address the major constraints faced by farmers, such as the lack of quality inputs and delays in veterinary services. The state should consider establishing mobile veterinary units to bridge service gaps and increase the adoption of practices like artificial insemination, which is currently at a low of 25% in Ghazipur compared to the state's average of 42%.
- ❖ **Subsidize Key Inputs and Technology:** To improve milk yield and quality, the government should subsidize mineral mixtures and nutrient supplements for cattle to address micro nutrient deficiencies in fodder. Promoting drought-resistant fodder varieties and biogas plants for energy and manure could also increase net returns for farmers.
- ❖ **Support Value Addition:** While liquid milk dominates the market, there is a growing demand for value-added products like ghee and paneer. Policies should encourage the development of small-scale processing and value-addition units at the farm or community level to provide farmers with a better price for their milk and diversify their income streams.

### **Constraints in Milk Marketing**

For the analysis of constraints in the contexts of term of ranks Garrett's ranking technique was used, the major constraints faced by farmers were identified. The top three were: High price of concentrate (Mean Score: 68.45), Low availability of green fodder (67.18), and Irregular payment by milk procurement agencies (66.90). The constraint of Non-remunerative price of milk ranked 8th, suggesting that while price is a concern, immediate input-related issues are more pressing for farmers.

### **5. Conclusion and Policy Implications**

The research study of research paper is based on original data of M.Sc Thesis dissertation 2024-25 specially focused on different milk marketing channels of intermediaries of Ghazipur district of Uttar Pradesh. Farmers sold milk among different intermediaries resulting in the marketing efficiency was found higher indicating no involvement of intermediaries. It concludes that the milk marketing system in Ghazipur is predominantly informal and inefficient. The proliferation of intermediaries significantly erodes the producer's share of the consumer's rupee, with farmers receiving as little as 61% in the most inefficient channel. The reliance on informal channels is driven by factors like prompt payment from vendors despite lower prices, and inadequate access to formal infrastructure policy implications:

1. **Strengthen Formal Channels:** Government and cooperatives must invest in establishing more milk chilling centres and procurement facilities in rural areas to reduce the distance farmers must travel, which is a key barrier to formal market participation (KPMG, 2022).
2. **Promote FPOs:** Encouraging the formation of Farmer Producer Organizations (FPOs) can empower farmers through collective bargaining, bulk input purchase (reducing costs by ~18%), and direct linkage with processors (DAHD, 2023).

3. Digital Market Linkages: Implementing digital platforms (e.g., WhatsApp groups, apps) can directly connect farmers with bulk buyers, halwais, and consumers, potentially increasing price realization by up to 20% (Aggarwal et al., 2023).
4. Infrastructure Development: Policies should focus on providing subsidized cold storage facilities and transportation to reduce spoilage, which is currently estimated at 20% of milk in the district (Dastagiri et al., 2023).
5. Input Subsidy and Support: Addressing the top constraints—high concentrate cost and fodder scarcity—through subsidies on feed, promotion of drought-tolerant fodder varieties, and reliable AI services is crucial for enhancing productivity and marketable surplus.

By addressing these areas, policymakers can transform the dairy value chain in Ghazipur into a more equitable, efficient, and profitable system, ultimately contributing to the goal of doubling farmers' incomes.

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11. Kushwaha & Kumar (2024) provide the most specific recent study for your thesis. They focus on milk production economics in Ghazipur, including costs, returns, marketing barriers, and gender roles in dairy. This review integrates \*\*current trends\*\* (post-COVID inflation, digital interventions) and \*\*region-specific challenges\*\* (fodder scarcity, low AI adoption). For Ghazipur, primary surveys on FPOs and climate adaptation strategies are recommended to fill data gaps.