SUPPLY CHAIN MANAGEMENT OF MILK IN UNORGANISED SECTOR OFVARANASI, UTTARPRADESH

काशी हिन्दू विश्वविद्यालय BANARAS HINDU UNIVERSITY

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREEOF

MasterofAgribusinessManagement

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BANARAS HINDU UNIVERSITY
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CERTIFICATE

To,

The Registrar

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U.P.,India.

(Through The Head, Department of Agricultural Economics)Sir,

This is to certify that the project entitled **"supply chain management of milk in unorganised sector of Varanasi"** submitted for partial fulfillment of the requirements for the degree ofMasterofAgribusinessManagementintheDepartmentofAgriculturalEconomics,InstituteofAgriculturalSciences,BanarasHinduUniversity,isarecordofbonafideresearchcarriedoutbyMr. Tarun Tripathi, ID No. 20412ABM028, under my supervision and no part of the project report has beensubmittedfor any otherdegreeor diploma.

Theassistanceandhelpreceivedduringthecourseofthisinvestigationandsourcesofliteraturehavebeendul y acknowledge.

Thankingyou.

Forwardedby Yoursfaithfully

(Head) **(Coordinator)** **(Dr.H.PSingh)**
(ChairmanofAdvisoryCommittee)

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LISTOFABBREVIATIONS

BHU	BanarasHinduUniversity
IAS	InstituteofAgriculturalSciences
et al.	Andotherpeople
Kcal	Kilo calary
g	Grams
mg	Mili grams

CHAPTER 1
INTRODUCTION

Dairy farming, a subset of agriculture that produces milk, has received enormous attention since it not only creates employment possibilities but also helps families better their diets and gives a huge number of rural and urban disadvantaged people in the nation a reliable source of income. The significance of dairy farms as a possible source of revenue and employment has grown in the rural areas with the implementation of "Operation Flood" in the nation. As a result, the dairy industry is crucial to the manufacture of milk products and contributes to making milk production one of the most lucrative economic sectors.

Despite the vast output of milk and its byproducts, milk consumption is rising quickly. This enormous milk consumption can be attributed to rising purchasing power, urbanization, changing eating habits and lifestyles, and demographic expansion. In 2016–2017, there are 351 grams of milk available per person, up from 307 grams in 2013–2014. The world's largest vegetarian community has no other supply of animal protein or essential elements besides milk, which has a wide range of health benefits.Demand for milk products is being driven by rising consumer interest in high-protein diets, as well as rising consumer awareness and availability of value-added dairy products via organized retail chains. As a result, the majority of the production is consumed domestically with no excess for the export market due to the enormous and continuously growing domestic demand and rising population with rising purchasing power. (Khongkai, 2020)

Nutrient composition of the whole milk of humans and selected domesticated animals (per 100 g)

Source	Energy (kcal)	Fat (g)	Cholesterol (mg)	Protein (g)	Calcium (mg)	Phosphorus (mg)	Carbohydrate (g)
Human	70	4.38	14	1.03	32	14	6.89
Cow	61	3.34	14	3.29	119	93	4.66
Goat	69	4.14	11	3.56	134	111	4.45
Sheep	108	7.00	—	5.98	193	158	5.36
Buffalo	97	6.89	19	3.75	169	117	5.18

1.1. Importance of milk

Since consumers frequently buy milk, they are generally aware of the market's alternate products (types, brands and prices). The products about which customers are most concerned

in terms of quality are milk and dairy. With regard to the nutritious qualities of milk, there is also a subjective element. People believe it is essential for a balanced, healthy diet, which is especially advised for kids. This raises further worry regarding its caliber. One of the industries most concerned with consumer impressions of food safety and product guarantees is the dairy sector. Quality is a very dynamic and culturally structured notion. It comprises aspects connected to product differentiation such as nutrition, food security, and safety. In a narrower sense, quality is a surplus over the requirements that firms highlighted as a differentiation strategy.

The food quality is almost perfect. It is very nutrient-dense. It provides energy-giving lactose and milk fat, body-building proteins, bone-building minerals, and vitamins. It also provides several important fatty acids and nutrients in a readily assimilable and attackable form because of all these benefits, milk is a crucial diet for everyone, including expectant mothers, growing kids, teenagers, adults, invalids, convalescents, and patients.

A complete milking of one or more healthy milch animals produces milk, which can be defined as a whole, fresh, clean, lacteal secretion that is free of colostrum and contains the minimum permitted percentage of milk fat and milksolids-not-fats. Milk cannot be obtained within 15 days before or 5 days after calving.

The National Dairy Development Board (NDDB) predicts that by 2022, milk demand would likely surpass 180 million tonnes. Over the next 15 years, there must be an average incremental growth of 5 million tonnes annually to supply the market, which is a double of the average incremental rate realized over the previous 15 years. In the absence of a significant rise in output, India will have to rely on imports from the global market. Additionally, the enormous volume needed will have an impact on milk prices around the world. However, compared to other major milk producing nations, India's cows produce just about 4 kg of milk per day on average.Forinstance, the average milk production per cow in the US is 25.6 kg per day, compared to 7.8 kg per day in China. The main cause of the poor output is that cross-breeding has received much of the attention in breeding, with little focus on improving the native breed. Another issue for dairy production at the input and production stages is the delivery of low-quality AI and animal health services in a timely manner. Farmers lament the ineffectiveness of these services.

Since milk is highly perishable, it needs to be processed, stored, and preserved right away so that it can be transported from the production areas to the demand centers. Therefore, a

productive supply chain is necessary for adding value.

Most milk markets are unorganized. The consumers in rural and urban areas, as well as the local hotels, restaurants, and confectionery stores, are significant participants in the informal milk marketing system. Milk producers use a variety of marketing techniques to offer their products to consumers. The milk producers in the study region advertise their products through the channels that are most convenient for them. The study looked at the various marketing strategies used by farmers and the promotion of those strategies.Marketableexcess, price variation, market effectiveness, and milk marketing restrictions are also examined in this study.

More so than increased productivity, India's milk output has grown quickly in part due to an increase in the number of animals. The low productivity of dairy animals is a major concern; the average Indian cow produces only 987 kg per lactation, compared to a global average of 2038 kg per lactation. Low productivity has been caused by the gradual breed degeneration that typically results from negligence over centuries, which has led to an increase in the population of unsightly cows (80 percent) and buffaloes (50 percent) as well as a chronic shortage of feed and fodder coupled with the low nutritional values and low fertility of our dairy animals.

Dairy products are purchased by retailers straight from processors. From the perspective of the consumer, a shorter marketing chain increases the likelihood that the retail price will be cheap and reasonable.Themajor drawback of hawkers selling milk directly to customers is the complete lack of quality control and the frequent and unlawful adulteration of milk with (filthy) water. An effective milk marketing network allows farmers to obtain at least 50% of milk's retail price.

Pasteurization: The term pasteurization refers to the process of heating each & every particle of milk to atleast 63° C for 30 minutes, or 72° C for 15 seconds in approved and properly operated equipment. After pasteurization, the milk is gradually cooled to 5° C or below.

Homogenization: Homogenization refers to the process of forcing the milk through a homogenizer with the object of sub dividing the fat globules.

1.2. Supply Chain Management (SCM)

Supply Chain Management (SCM) is the process of organizing, carrying out, and overseeing the activities of the supply chain with the aim of effectively meeting consumer demands.

Supply chain management covers all raw materials storage and transportationmaterials, inventories of work-in-progress, and finished commodities from the point of production to the point ofconsumption.The term supply chain management was coined by consultant Keith Oliver, of strategy consulting firm **Booz Allen Hamilton in (1982)**

Improved supply chain coordination is essential for any company to consistently succeed and be profitable. The most compelling justification for such a claim is that the constantly intensifying competition, which is constantly influenced by business globalisation, product diversity, and technological advancement, motivated independent firms to cooperate in a supply chain that enables them to benefit from one another **Thomas and Griffin (1996) .**

There is a lack of coordination in the supply chain when each stage has insufficient knowledge of the product, information, and financial flow. These factors will lower supply chain performance overall. As a result, supply chain coordination is essential to attaining the all-level consensus, which enables various supply chain participants to appropriately respond to market demands **Chopra S, Meindl P (2005) .**

Those involved in the supply chain have traditionally performed these tasks on their own in localized traditional company activities. But with the fierce competition in the industry today, it is not suggested to conduct business on your own **Xu and Beamon (2006) .**

Coordination of the supply chain also entails collaboration between businesses and the sharing of critical information with one another during the development, production, and distribution of goods and services to final markets. Another definition of coordination is arranging the efforts of one or more supply chain drivers so that they are effective and aware of one another's activities while yet working independently to achieve their own set of objective. **Ning C, Zhiming Z, Kin Man T, Keng PN (2008) .**

Dairy farmers adhere to stringent processing and handling guidelines from milking the cows to distributing the product to guarantee that consumers receive the freshest and safest milk possible. The supply chain has only became more complex as the variety of dairy products available on the market has expanded, necessitating even higher levels of accuracy and speed throughout

1.3 From the Farm to the Kitchen

The actual delivery of milk is a rather easy operation. The dairy is moved to on-site chilling storage tanks or a chilled trailer after the cows are milked, where it is kept at a temperature of not greater than 40 degrees. The milk is then driven along an efficient route by truck to a

processing facility. Before being homogenised, pasteurised, and cartonized at the facility, the milk is inspected for contamination. Retailers get the packaged milk after which they sell it to consumers.

Traceability has always been essential to the supply chain for dairy products, but after Congress approved the Food Safety Modernization Act in 2010, it gained even more importance. Agricultural businesses now need to take even more care to ensure the quality and safety of their products while they are being transported from the farm to the store because the legislation gives the FDA the authority to compel product recalls and imposes even stricter requirements on sanitary transportation.

1.4 An Automated Solution

Fortunately, recent advances in tracking technologies and data collection solutions have made the dairy supply chain more traceable than ever. Dairy cooperative Agri-Mark, for example, achieved end-to-end traceability as soon as it started approaching its tracking strategies as a form of data synchronization. "We recognized that we were still collecting a lot of data on paper, which increases the risk of errors, so we recommended to senior management that we bring some automation in order to improve our processes," Agri-Mark's Supply Chain Director Susan Zucker told Supply Chain Brain.

Agri-Mark may soon be able to locate any shipment at any stage of delivery by automating data collection. "The next stage of data synchronisation, in our opinion, is end-to-end traceability, adds Zucker. "We must carefully consider the most important data we want to gather, where we will gather it, and how we will report it.

In fact, various facets of the dairy supply chain have changed recently to meet changing customer preferences. Deliveries by rail, as opposed to trucks, are becoming more common for dairy products that remain longer, such shredded cheese, for instance. Similar to how liquid milk can be transported over greater distances than dry milk, exports of dry milk products have increased. To ensure that no dairy lover ever has to grieve over spilled milk, even these goods owe their safe delivery to the same well-coordinated supply chain as their liquid counterparts.

1.5 Objectives of the study

1. To study the socio-economic profile of the respondents.
2. To identify the stakeholders and map the supply chain of unorganized sector.
3. To estimate the marketing costs, margins and efficiency of supply chain.
4. To identify the constraints in the supply chain.

1.6 Limitations of the study

1. Based solely on information gathered from one part of the district of Varanasi, Uttar Pradesh, this study has been conducted. Therefore, if Varanasi is included in the study as a whole, the results may differ.

2. Since primary data are gathered through interviews, there are chances of mistake because farmers are hesitant to provide accurate information.

CHAPTER 2
REVIEW OF LITERATURE

A review of literature provides a brief overview of previous research studies that have been conducted in India or in other countries. A review of past research helps in the brief description of the research done in that area and also helps in identifying the conceptual as well as methodological issues relevant in achieving the objective of the study. This allows the researcher to detect gaps, collect relevant data, and apply sound reasoning and interpretation to it .

Objectives of the study

2.1 Socio-economic profile .

2.2 Supply chain management in unorganized sector in dairy .

2.3 Marketing costs, margins and efficiency in dairy sector.

2.4 Constraints in supply chain management in dairy.

2.1 Socio-economic profile of the respondents

Hasan Cicek (2007) investigated the social and technical elements determining the cost of dairy businesses. Results showed that the size of the enterprise, the amount of feed consumed, the amount of feed purchased, and the size of the litter herd had a substantial impact on milk prices. On the other hand, one major concern with milk marketing. The producer's occupation and age were discovered to be statistically unimportant ($P > 0.05$). The author came to the conclusion that limiting the technical and socioeconomic issues was successful have significant impact on reducing the production cost and raising the business's ability to be profitable.

Chand *et. al.* (2008) conducted research on the socio-economic circumstances of Middle Andaman dairy farmers. According to the report, the average yearly income of dairy farmers is $74,000, of which 39.19 percent comes from the agricultural sector and 60.81 percent comes from other sources. 1.11 hectares of land were owned on average, and each household had 1.65 animals. Local cows, buffaloes, and crossbred cows were the milch animals that farmers raised; there were 0.78, 0.60, and 0.27 milch animals per family, respectively.

Mandeep and Joshi (2008) the economics of marginal and small farmers' dairy farming in Punjab were examined. According to the study's findings, the majority of farm households are unable to meet their needs only through agricultural income. Dairy farming also became a significant associated industry for boosting the income of marginal and small farmers. Another big aspect that considerably contributes to the disposable income of these agricultural households is income from non-farm sources.

Lawrence *et. al.* (2016) the goal of the current study was to determine how dairy farmers'

socioeconomic traits influenced their entrepreneurial behaviour in Tamil Nadu's Villupuram area. A pre-tested, semi-structured interview was used to get the data. Schedule from 100 dairy farmers chosen at random. The findings showed that the majority ofsocioeconomic factors including age, occupation, education, property ownership, style of housing, etc. Their entrepreneurial behaviour had been greatly influenced by herd size. It is necessary development and use of effective educational techniques to raise student achievement dairy producers' entrepreneurial behaviour, which in turn affects the productivity of Mild creatures.

Rajadurai *et. al.* (2018) the majority of dairy farmers in Puducherry were female (61.8 percent), middle-aged (47.7 percent), and literate (81.9 percent), with an average herd size of 4.01 cow and a mean monthly income of Rs. 10,500. Additionally, 71.4 percent of the farmers lacked access to land. With an average of 25.5 years of experience, dairy farming was the respondents' first and secondary occupations in that order (51.4 percent and 48.6 percent, respectively).

2.2 Supply chain management in unorganized sector of dairy .

Singh *et. al.* (1987) the milk federation had played a commendable role in the collecting and distribution of mi Supply chain management in unorganized sector of dairy .lk, particularly in rural areas, where the function of milk sellers was still dominating. The study examined milk production and marketing channels in various regions of Punjab State. According to a study, milk sales through the Milk Federation were more profitable than those through alternative marketing channels.

Sree Devi (1992) it has been discovered that both members and officials have a favourable opinion of milk cooperatives. After joining the co-operatives, people were able to receive a variety of benefits, including cattle feed, green fodder seeds, medicines, vaccinations, and artificial insemination services. As a result, milk production considerably rose.

Chahal (1996) in his study, evaluated the data acquired from people in the social orders of milk producers, milk merchants who sold milk to milk merchants, sweet shops, and adjacent customers, as well as milk merchants who sold milk to centres attached to private milk plants. He has argued that by fiercely challenging the private brokers, the milk co-agents are adopting a beneficial role in the provincial milk advertisement.

Bhanja *et. al.* (2000) conducted research on several methods for developing human capital and connecting farmers with markets. According to a study, livestock products have a shelf life of 4-5 hours at room temperature and are perishable in nature without suitable cold storage facilities. Before cattle products are transported over great distances for marketing, they must always undergo some intermediate processing and be packaged in a sterile state.

Muriukiet (2010) did a study on Ethiopian small-scale milk processing and commercialization. According to the study, 35.0% of the smallholder dairy farmers who were questioned who sold their raw milk through informal milk marketing channels. On the other hand, 25% of the respondents sold their milk both formally and informally.

2.3 Marketing costs, margins and efficiency of supply chain

Singh and Sharma (1984) evaluated the component- and process-level costs of manufacturing ice cream ina North-West Indian milk facility for the 1976–1977 fiscal year. The two ice-cream packs, 60 ml and 120 ml cups, were assessed to have a production cost of Rs. 0.64 and Rs. 1.27, respectively. About one-third of the entire cost of production was made up of raw material costs, and these costs rose with pack size. About 70 percent of the entire manufacturing cost was attributable to the freezing and hardening processes.

Shah (1992) noticed changes in the Gujrat-based dairy company Sumul's sales, capital, and profit. The data for the final year 1976 to 1985 showed that capital and turnover growth was comparable. Both had grown by a factor of four, whereas the comparable growth in profit was just 2 to 3 percent. The escalation of profit, capital, and turnover had no correlation.

Verma, et. al. (1997) in a study that was conducted in the Haryana town of Karnal to determine whether milk quality had declined during the marketing and to calculate real margins in the milk trade, it was discovered that during lean seasons, milk supplied directly to consumers by producers was of higher quality and cost an average of Rs. 5.68 per litre than milk sold to vendors and halwas for Rs. 4.75 and Rs. 4.04 per litre, respectively.

Ray and Sunil (2000) according to research done in the city of Jaipur, neighbourhood milkmen deliver fresh, unpasteurized milk to customers' doorsteps or to vendors who then give it to houses. Depending on the amount of water added to the milk and the type of consumer, rates for cow's milk ranged from Rs. 13 to 20 per litre. Small farmers often received a price of Rs. 10–12 per litre from a local vendor, compared to merely Rs. 9–10 from cooperatives. Some intermediaries even sent out 52 daily-wagelabourers to collect milk from doorsteps and transport it to various selling locations in surrounding large towns using bicycles, jeeps, or camel carts.

Mengade (2004) investigated the procurement, processing, and distribution management of Parag Milk & Milk Products in Manchar, district of Pune. According to her observations, the chosen dairy unit's overall work performance was economically viable given its net profit of Rs. 722.88 lakhs during the 2002–2003 fiscal year. Less milk was utilised in the production of milk products than was used in the distribution of liquid milk. During the study year, there

was a loss of milk equal to 1.22 lakh litres (0.3 percent) due to handling and transportation.

2.4. Problems in the supply chain

Gill and Parmar (1990) when examining the issues facing Punjabi dairy producers, it was found that inadequate health care, summer stress, subpar artificial insemination services, subpar nutrition, and a lack of coordination between various dairy development agencies were the main issues.

Banerjee (1992) recognised that many of India's dairying issues were caused by a huge human and cow population that was being supported on a small amount of land. The dairy industry was constrained by seasonal and regional differences in milk output, a rising milk demand, and the same. It was anticipated that the dairy industry will undergo changes in the 1990s, including modernization of dairy plants, product diversification, enhanced packaging, and staff training.

Shela (2000) examined the issues facing DudhUtpadak Sangh. According to him, the dairy unit's main issues were high procurement costs, poor milk quality, and fierce rivalry from the private sector operating in the same region.

Rahma *et. al.* (2002) studied about traditional marketing channels and revealed that Gowalas collect milk from the producer sometime mix water or milk powder for more profit,and sell this in urban market. In the rural area Gowala perform the door- to- door milk collection from milk producer and deliver the milk to consumers.

Rangasamy and Dhaka (2008) in Tamil Nadu, milk and its products from the cooperative and commercial sectors examined. They investigated the price of marketing differentsorts of milk including full cream milk, standardised milk, and also revealedthat the study's two dairy facilities' marketing costs for toned milk were comparable.Additionally, research shows that private sector products have higher marketing margins than cooperativedairy plants, and the effectiveness of cooperatively produced goods' marketinga private dairy plant, with the exception of toned milk.

CHAPTER 3
RESEARCH MEHTODOLOGY

To attain the objectives of this study following research methodology would be adopted. The scientific study of any problem using appropriate methods and procedures requires a systematic investigation in order to arrive at valid, unbiased, and useful results. This chapter briefly describes the study area's features, the sampling procedures used, the nature and sources of data collection, and the various statistical tools and techniques that are used to analyze the data.

To attain the objectives of this study following research methodology have been adopted.

3.1 Research Design

Descriptive research design is used for the study.

3.2 Information required

The study emphasis on the existing supply chain of milk production.

3.3 Data Source

Primary data for the study was obtained through personal interview of farmers and traders (middle man, retailers).

3.4 Area of study

Godowalia area of Varanasi is chosen as area of study.

3.5 Sampling Size

For this study, 50 respondents were taken .

3.6 Analytical tools

Data have been collected through structured questionnaire by personal interview and tabulated .

3.6.1 Descriptive Statistics

To achieve first objective descriptive statistics was employed to analyze the socio-economic profile of respondents (age, education, family member, livestock, production and selling of milk, main source of income) .

3.6.2 Marketing cost

It means actual expenses incurred during the marketing process

$C = C_F + C_{m1} + C_{m2} + ... + C_{m3}$

Where ,

C = total cost of marketing of the commodity

C_f = cost paid by the producer from the time the produce leaves the farm till he sells it .

C_{mi} = cost incurred by i^{th} middleman in the process of buying and selling the product .

3.6.3 Marketing margin

This method was used in objective 3 to calculate the marketing margin of intermediaries .

Ami = Pri - (Ppi + Cmi)

where,

Ami = absolute margin of i^{th} middleman

P_{ri} = total value of receipts per unit (sales)

P_{pi} = purchase value of goods per unit (purchase price)

Cmi = cost incurred on marketing per unit

3.6.4 Marketing efficiency

Acharya**'s** Method was used in calculating the marketing efficiency in objective 3 .

MME = FP / (MC+MM)

where,

MME = Modified Marketing efficiency

FP = Price received by farmers

MC = Marketing costs

3.6.5 Garrett's ranking technique

Garrett's ranking technique is used to achieve objective 4 , in this method the respondent's were ask to rank the specific problem faced by them . The assigned rank was converted into percentage position which is subsequently transferred into Garrett score using Garrett's table . For each constraints scores of individual respondents were added together and then divide by total number of respondents . thus , mean score for each constraints has been ranked by arranging them into decending order .

Percent position = 100 (Rij - 0.5) ÷ Nj

Where:

Rij = Rank given for the i^{th} item by j^{th} individual

Nj = Number of items ranked by j^{th} individual

CHAPTER 4

DESCRIPTION OF STUDY AREA

4.1. History

One of the world's oldest cities that has been inhabited continuously is Varanasi. It was among the earliest significant urban centres in the middle Ganges valley. By the second millennium BC, Varanasi was the centre of Vedic philosophy and religion in addition to being a bustling economic and industrial hub known for its sculpture, muslin and silk textiles, perfumes, and ivory carvings. When the Buddha first preached there in Sarnath in the sixth century BC, it was the seat of the kingdom of Kashi.

The city's religious and cultural pursuits saw some alleviation under the Mughal ruler Akbar in the 16th century. Late in the 17th century, under the rule of the Mughal emperor Aurangzeb, there was another setback; nevertheless, the Marathas afterwards funded a fresh upsurge. In the 18th century, Varanasi became a sovereign state, and under British rule, it continued to be an important city for trade and religion.

In 1910, the British established Varanasi as a new Indian state, with Ramnagar (on the other side) serving as its capital but having no control over the city. Varanasi state was included into the state of Uttar Pradesh in 1947 with the declaration of Indian independence.

4.2. The contemporary city

With kilometers of ghats, or steps, for religious bathing, Varanasi has the best riverfront in all of India. A variety of shrines, temples, and palaces rise tier upon tier from the water's edge. The newer outer suburbs are larger and more thoughtfully planned than the older innercity streets, which are congested and impossible for motor vehicles to navigate. Devout Hindus

aim to travel the Panchakosi route, visit the holy city once in a lifetime, and, if feasible, pass away there in old age. The Panchakosi road surrounds the sacred city.Each year, more over a million pilgrims visit the site. Additionally, the city receives a massive influx of domestic and international tourists each year, and tourism-related businesses play a big role in the local economy.

Among the many temples in the city, those for Shiva's deity Vishvanatha (also spelled Vishwanath), Hanuman's monkey deity Sankatmochana (also spelled Sankat Mochan), and Durga are the most revered. The hordes of monkeys that live in the big trees close to the Durga Temple are well-known. Another significant religious structure is the Great Mosque of Aurangzeb. The Tulasi Manas and Vishvanatha temples on the Banaras Hindu University campus are two of the more significant contemporary temples.As some Hindus attempted to rebuild the temple that had been demolished on that location in the 17th century, the Gyanvapi Mosque, which is next to the contemporary Vishvanatha temple, came into conflict. There are hundreds more temples throughout the city. A few miles north of Varanasi, at Sarnath, there are temples constructed by the Chinese, Burmese, and Tibetan Buddhists, the Maha Bodhi Society, and old Buddhist monasteries and temples in ruins.

There are several religious festivals held throughout the city. There is a parade from the Mahamrityunjaya Temple to the Kashi Vishvanatha (Vishwanath) Temple to commemorate Mahashivaratri, the glorious night of the god Shiva. The Ganges River goddess, who is revered by all Hindus, is honoured during the Ganga festival in November or December. On the ghats and in the river are thousands of lamps that have been let adrift. The Bharat Milap celebration, which takes place in October or November, honours the 14-year exile of Lord Rama and his younger brother Bharat. In March, the city's Tulsi Ghat beside the river hosts a five-day festival of dhrupad (traditional Indian vocal style), drawing renowned performers from all around India.

The city is a hub for music, dance, and arts and crafts. The silks and brocades made in Varanasi are renowned for their intricate gold and silver thread work. At Bhadoi, there is a renowned centre for carpet weaving. In Varanasi, you can also find brassware, glass, ivory, and wooden toys being produced.

A significant regional transportation centre is Varanasi. It is a significant railway intersection that is connected to other cities in Uttar Pradesh and other regions by highways. The distance between the city centre and Lal Bahadur Shastri International Airport is around 12 miles (20 km).

Plate 1. Map of Varanasi

CHAPTER 5
RESULTS AND DISCUSSION

This chapter is necessary because the collected data is discussed in a logical sequence consistent with the main objective or focus of the research question. This chapter also involves the interpretation of the true meaning of the stated facts and the purpose of the investigation in the form of data. The purpose of explanation and generalization is to find the broadest meaning of these answers by connecting them with other available knowledge. In summary, this chapter is said to imply an empirical statement of the research objectives. In this chapter, the results of the study conducted are presented and discussed under the following headings.

5.1. Socio-economic profile of the farmers

5.2. Channel in supply chain

5.3. Marketing costs, margins, efficiency.

5.4. Constraints in the supply chain.

5.1 To study the socio-economic profile of the farmers

The socio-economic profile of the respondents are presented below.

5.1.1 Age wise distribution of dairy farmers

Out of 50 farmers, the large number of farmers were of aged between 40 - 50 years (42.30 percent), followed by the age group of 30-40 years (26.92 percent), then age group of above 50 years (21.15 percent) and least were the age group of 20-30 years (9.61 percent).

Table 5.1.1 Age wise distribution of dairy farmers

Age group (years)	Frequency	Percentage
20-30	5	9.61
30-40	13	26.92
40-50	21	42.30
Above 50	11	21.15

5.1.2 Education of dairy farmers

As per the table 5.1.2 it can be seen that the large number of farmers were not educated (94 percent), followed by farmers which are high school passed (6 percent), none of have completed their intermediate (0 percent)

Table 5.1.2 Education of dairy farmers

Qualification	Frequency	Percentage
Not educated	47	94
High school	3	6
Intermediate	0	0

5.1.3 Number of family members

Most of the farmers live with the joint family therefore, there are 5 - 8 family members in most families (46.15 percent) and some farmers live with even above 8 family members (28.84 percent) followed by farmers who live with 1 - 4 members in family (25 percent).

Table 5.1.3 Number of family members

Number of members	Frequency	Percentage
1-4	13	25
5-8	23	46.15
Above 8	14	28.84

5.1.4 Number of family members involved in dairy

Out of 50 most of the farmers have no family member involved in dairy (50 percent). (44.23 percent) farmers have involvement of 1-3 members of their family in dairy and some farmers have involvement of above 3members (5.76 percent) of their family.

Table 5.1.4 Family members involved in dairy

No. of members	Frequency	Percentage
0	25	50
1-3	22	44.23
Above 3	3	5.76

5.1.5. Number of livestock

The study's findings shows that 25 farmers (48.07 percent) have 1-5 livestock in numbers, followed by (26.92 percent) farmers have 6-10 livestock in numbers and only (25 percent)

farmers have large number of livestock that is above 10.

Table 5.1.5 Number. of livestock

Livestock	Frequency	Percentage
1-5	25	48.07
6-10	13	26.92
Above 10	12	25

5.1.6. Production of milk per day

As per the table 5.1.6 it can be seen that, 34 farmers (67.30 percent) have highest production of milk i.e. 0-25 litre, 23.07 percent farmers have the production of 26-50 litre of milk whereas 9.61 percent farmers have above 50 litre of milk production.

Table 5.1.6 Production of milk per day

Production (Liter)	Frequency	Percentage
1-25	34	67.30
26-50	11	23.07
Above 50	5	9.61

5.1.7. Selling of milk per day

Most of the farmers (71.15percent) sells the milk in between 31-60 litre, followed by (19.23percent) sells the milk above 60 litres. 9.61percent farmers sell the milk in between 1-30.

Table 5.1.7 Selling of milk per day

Quantity (Liter)	Frequency	Percent

1-30	5	9.61
31-60	36	71.15
ABOVE 60	9	19.23

5.1.8. Main source of income of dairy farmers

All the 50 farmers (100 percent) major earning comes from dairy. No other source of earning such as agriculture or any shops produce large revenue as compare to dairy.

Table 5.1.8 Main source of income

Source	Frequency	Percentage
Dairy	50	100%
Others (Agriculture, shop etc.)	0	0

5.2. Existing supply chain of milk

Supply of milk through channel 1 was 80 percent and Channel 2 was 23 percent . This method is adopted by farmers traditionally for selling of their milk.

5.2.1. Mapping of existing supply chain

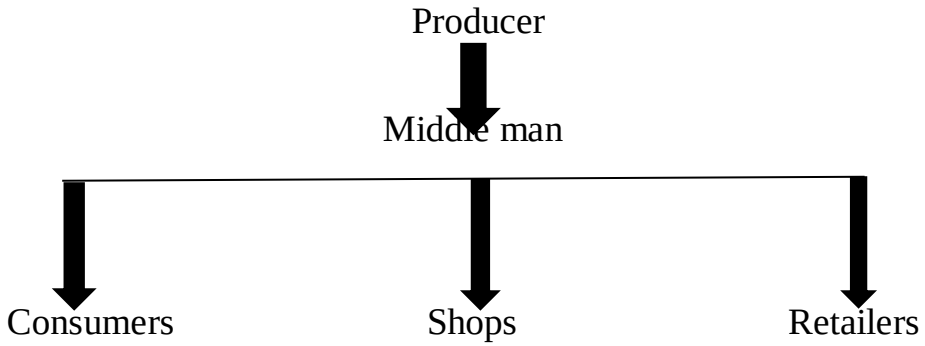

Exhibit 5.1. Milk supply through Channel 1

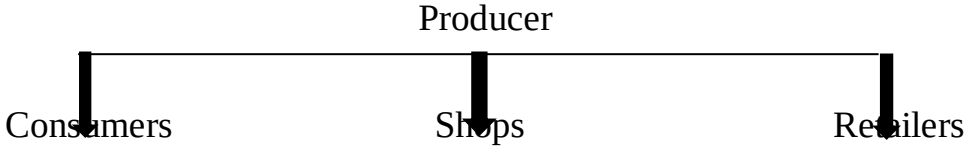

Exhibit 5.2. Milk supply through Channel 2

5.3 Marketing costs, margins and efficiency of channels

5.3.1 Marketing costs

Total marketing cost constitutes transportation cost and miscellaneous cost on the basis of per litre of milk. Here two channels namely channel 1 and channel 2 were taken into consideration for calculating the marketing cost . In channel 1 per day milk selling was 47 litre and transportation cost is 310 Rs with miscellaneous cost 50 Rs . In channel 2 per day milk selling was 53 litre and transportation cost is 330 Rs with miscellaneous cost 50 Rs .

Table 5.3.1 Marketing cost

Particulars	Chanel 1	Chanel 2
Transportation cost (Rs per litre)	**6.49**	**6.22**
Miscellaneous cost (Rs per litre)	**1.06**	**0.94**
Total Marketing cost (Rs per litre)	**7.55**	**7.16**

5.3.2 Marketing margins

Marketing margin can be calculated by taking intermediaries into consideration. The share of intermediaries per litre of milk given the marketing margin for each channel respectively . . In channel 1 there were no intermediaries . In channel 2 the middleman is purchasing at 32 Rs per litre from producer and selling at 45 Rs per litre , in which his marketing cost is 7.16 Rs per litre .

Table 5.3.2 Marketing Margins

Particulars	Channel 1	Channel 2
Intermediaries (Rs Per litre)	**-**	**5.8 Rs**
Total Marketing Margin (Rs Per litre)	**-**	**5.8 Rs**

5.3.3 Marketing efficiency

There are different method for calculating marketing efficiency , here Acharya**'s** method is used , which is done by calculating total marketing costs , marketing margins and price received by the producer on the basis of per litre milk . From the table we can clearly see that channel 1 which has no intermediaries has higher marketing efficiency then channel 2 .

Table 5.3.3 Marketing efficiency

Particulars	Channel 1	Channel 2
Consumer Purchase Price (Rs Per litre)	**45 Rs**	**45 Rs**
Total Marketing Cost (Rs Per litre)	**7.55 Rs**	**7.16 Rs**
Total Marketing Margin (Rs Per litre)	**0**	**5.8 Rs**
Price received by farmer (Rs Per litre)	**37.45 Rs**	**32 Rs**
Marketing Efficiency (Acharya's Method)	**4.96**	**2.46**

5.4. Constraints in supply chain of milk in unorganized sector

Garrett ranking technique was used to evaluate the constraints in supply chain of milk in unorganized sector and the result revealed that the most important constraint faced by the farmer was unable to sell the whole quantity of milk that they bring into the market with Garrett score 75 , followed by selling at low price : (40) , transportation (60) , storage (50) , and the last ranked constraint was high temperature with Garrett score 25 .

Table 5.4 Constraints in supply chain

S. No.	Constraints	Percent Position Value	Garret Value	Avg. Score	Rank
1	Unable to sell whole quantity of milk	10	75	62.5	1st
2	Selling at low price	70	40	57.9	2nd

3	Transportation	30	60	45.7	3rd
4	Storage	50	50	43.6	4th
5	High Temperature	90	25	40.5	5th

CHAPTER 6
SUMMARY AND CONCLUSIONS

The process of planning, carrying out, and monitoring supply chain activities with the goal of successfully satisfying customer requests is known as supply chain management (SCM). From the point of production to the point of consumption, supply chain management includes all raw materials, storage and transit materials, inventories of work-in-progress, and finished goods.

Customers are often aware of the alternatives on the market because they routinely purchase milk (types, brands and prices). Dairy and milk goods are the ones that clients are most worried about in terms of quality. There is a subjective component in relation to milk's nutritive properties. People hold that having a balanced, healthy diet is crucial, and youngsters should especially follow this advice. This adds to my concerns about its quality. The dairy industry is among those most concerned with how consumers perceive product warranties and food safety. Quality is a concept with a strong cultural foundation. It includes characteristics related to product differentiation, such as safety, food security, and nutrition.

The National Dairy Development Board (NDDB) predicts that by 2022, milk demand would likely surpass 180 million tonnes. Over the next 15 years, there must be an average incremental growth of 5 million tonnes annually to supply the market, which is a double of the average incremental rate realised over the previous 15 years.

Milk markets are typically not structured. Consumers in both urban and rural locations, as well as nearby inns, eateries, and candy shops, play a vital role in the informal milk marketing system. A range of marketing strategies are used by milk producers to advertise their goods to consumers.

More so than better productivity, a rise in the number of animals has contributed to India's rapid growth in milk production. Dairy animals are not very productive, with the average Indian cow producing only 987 kg during lactation as opposed to the global average of 2038 kg. The gradual breed degeneration that typically happens over centuries of neglect has led to an increase in the population of unsightly cows (up to 80 percent) and buffaloes (up to 50 percent), as well as a persistent lack of feed and fodder combined with the low nutritional value and low fertility of our dairy animals. These factors have all contributed to low productivity.

Pasteurization is the process of heating each and every milk molecule to at least 63° C for 30 minutes, or 72° C for 15 seconds, in equipment that has been approved and is being used in

accordance with proper procedures. The milk is gradually chilled to 5° C or less after pasteurisation.The act of putting milk through a homogenizer to separate the fat globules is referred to as homogenization.

Objectives of the study :

6.1 Socio-economic profile .

6.2 Supply chain management in unorganized sector in dairy .

6.3 Marketing costs, margins and efficiency in dairy sector.

6.4 Constraints in supply chain management in dairy.

Descriptive statistics like percentage for objevtive 1 , marketing cost , margins and acharya**'s** modified method for objective 3 and garret's ranking for objective 4 were used .

6.1. Socio-economic profile of farmers

In present research farmers' details were taken respect to their age, family composition, educational attainment, number of animals, number of dairy-related family members, daily milk output, daily milk sales and primary source of income, .

Out of 50 farmers, 42.30 percent were between 40-50 years old, followed by 30-40 years old (26.92percent), above 50 years (21.15 percent), and 20–30 years old (which accounted for the least number of farmers) (9.61 percent).

Out of 50, the majority of farmers (94percent) were uneducated, followed by farmers with high school (6percent), and none of them have completed intermediate.

Most of the 50 farmers don't have any relatives who work in the dairy industry (50percent). 1-3 members of the farmer's family work in the dairy industry in 44.23 percent of cases, while other farmers employ above 3 members (5.76percent).

Most farmers live in family that have members between 5 and 8 (46.15percent), and some have as many as more than 8 members (28.84percent). Farmers who live with 1 to 4 family members are next (25 percent).

As per the study, 25 farmers (48.07 percent) have 0-5 animals, followed by 26.92 percent who have 6-10 animals, and only 13 farmers were having above 10 animals (25 percent).

As per the study, 67.30% produce the most milk between 0 – 25 l, followed by 23.07 percent who produce milk between 26 and 50 litres and only 9.61 percent who produce milk above 50 percent.

The majority of farmers (71.15 percent) sell milk in the 31-60 litre range, whereas (19.23 percent) sell milk in quantities greater than 60 litres. Only 9.61% of farmers sell milk in quantities under 30 litres.

The dairy is the main source of income for all 50 of the farmers. There are no other

employment opportunities that generate more revenue.

6.2 Existing supply chain of milk

From the study conducted it was concluded that supply of milk through Channel 1 was 20 percent and Channel 2 was 80 percent , hence making channel 2 the more opted option by the farmers .

6.3. Marketing costs , margins and efficiency of channels

Total marketing cost include transportation cost and price that is given to the manager of unorganized sector on the basis of per litre of milk. The marketing cost of channel 1 (7.55 Rs) is more than that of channel 2 (7.16 Rs) .

Marketing margin can be calculated by taking intermediaries into consideration. The share of intermediaries per litre of milk given the marketing margin for each channel respectively , as there were no intermediaries in channel 1 the marketing marging was 0 and in channel 2 marketing margin was 5.8 .

The price received by the farmers after deducting the marketing cost in channwl 1 is 38.02 and channel 2 is 32 due to which the marketing efficiency of channel 1 (4.96) is greater then the marketing efficiency of channel 2 (2.46) .

6.4. Constraints in the supply chain of unorganized sector

The most important constraint faced by the farmer was unable to sell the whole quantity of milk that they bring into the market with Garrett score 75 , followed by selling at low price : (40) , transportation (60) , storage (50) , and the last ranked constraint was high temperature with Garrett score 25 .

Policy Implication

The respondents should have a proper storage facility so that farmer can preserve the unsold milk and does not have to sell it at low cost.

Cool chambers like mini fridge can be used for transportation to reduce the impact of high temperature on the milk.

The farmers can directly sell there produce to gain more profit .

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