

## METHODS

# Role of emerging technologies in marketing of milk through DCS

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The dairy sector has been considered as one of the major contributors to India's GDP. Looking at the production rate globally, India has achieved the no. 1 position in production of milk with 23% production, followed by the United States of America, China, Pakistan, and Brazil. Dairying has been considered the basic source of income for millions of rural populations in India, which contributes to the country's economy. In this particular study, the authors have discussed about the role of emerging technologies in marketing of milk through Dairy Cooperative Societies (DCS). DCS has streamlined the process and made it easy for farmers to supply their milk to DCS at village level, which in later stage reaches the milk processing units and comes back to customers through outlets as consumable goods. This chain link will help farmers in getting fair, remunerative prices for their produce with the help of online monetary transactions. Online applications have been developed by DCS in order to make easy access for farmers regarding all the information related to their supply quantity and their earnings. The authors have also incorporated SWOC analysis in understanding the strengths, weaknesses, opportunities, and challenges involved in the marketing of dairy products through cooperative societies. The authors have also discussed about the traditional and post-COVID-19 modernized ways of marketing of milk. The authors in the paper have developed a conceptual model that discusses about the supply of milk from first-point farmers through middle-level players (DCS) who transform raw milk into finished goods and supply it to the final consumer with the help of retail outlets that exist in the city. In this study, the authors have provided a few suggestive measures that help DCS in making their business more successful.

**Keywords:** dairy, Dairy Cooperative Society (DCS), milk, SWOC

## Introduction

Dairy sector has been considered one of the major contributors to India's GDP. Looking at the production rate globally, India has achieved the no. 1 position in the production of milk with 23% production, followed by the United States of America, China, Pakistan, and Brazil. Dairying has been considered the basic source of income for 70 millions of the rural population in India with 30.2 crores cattle heads. Here, farmers usually domesticate the animals for the purpose of dairying, and it has been their livelihood that is generating their daily wage source, and at present it

has become one of the main sources of contribution to the national economy in India as a farm commodity.

India was basically suffering with less production of milk and malnutrition. In order to overcome this issue, Dr. Verghese Kurien started the White Revolution, which in turn contributed to self-sufficient production of milk in India, and the upgradation of this was the establishment of Dairy Cooperative Societies (DCS) in India. Karnataka Dairy Development Cooperation has been considered India's first DCS funded by the World Bank/International agency, which was started in Karnataka at the village level in 1974. In the later stages, the Anand Pattern of a three-tier system was adopted at village level to procure milk from rural

farmers, at district level for processing and marketing of milk that has been collected at the village level and providing technical assistance to the farmers to improve the production of milk, and finally at state level to maintain coordination throughout the state on cooperative societies work progress and efficiency; this cooperative body took the shape of the Karnataka Milk Federation in 1984, encompassing the entire state with 14 cooperative milk unions and 14000+ milk cooperative societies.

The current situation of dairy sector in India is observed as one of the single largest agriproducts in the country, which is currently contributing 5% to India's GDP. The dairy sector has also employed more than 80 millions farmers directly. In recent times, post-COVID-19, per capita consumption of milk has also increased due to changes in the dietary plans of consumers and the effects of urbanization throughout. A unified quality mark logo called "Dairy Mark" has been introduced by the National Dairy Development Board and Bureau of Indian Standards throughout India in order to build consumer confidence in milk and milk products.

In this particular study, authors have discussed the emerging technologies in the marketing of milk through DCS that have been streamlined the process and made it easy for farmers to supply their milk to DCS at village level, which in later stages reaches the milk processing units and comes back to customers through outlets as consumable goods. This chain link will help farmers in getting fair remunerative prices for their produce. This entire cycle is tracked with the help of an application that has been developed and maintained by DCS. The authors have also incorporated SWOC analysis in understanding the strengths, weaknesses, opportunities, and challenges involved in marketing dairy products through cooperative societies.

**Table 1** indicates the list of the top 10 countries along with the quantity of milk produced by them. India stands at the no. 1 position in milk production by producing 196.18 million tons. The main back bone for this position is that the number of cattle in the country is higher when compared with other countries, and India is the country of farmers and agriculture, followed by the United States with 99.16 million tons, where individual farmers own huge herds of cattle on huge parcels of grazing land.

The **Figure 1** chart is taken from the "Department of Animal Husbandry and Dairying (1)." The **Figure 1** clearly indicates the growth of milk production in India since 2011. In the year 2011, milk production in India was around 127.9 million tons and with 289 *per capita* availability. It is observed that the consistent growth in milk production was maintained in every financial year. In the financial year 2020–2021, it was observed that 210 million tons of milk were produced with a *per capita* availability of 427 g per day.

**Table 2** indicates the list of top 10 milk processing units and the states they belong to, where AMUL stands in first place in India from Gujarat state, followed by Nandini, a

**TABLE 1** | Top 10 milk producers on the world.

Sl. No	Country	Prod. (million tons)
I.	India	196.18
II.	United States	99.16
III.	Pakistan	47.30
IV.	Brazil	35.17
V.	China	32.67
VI.	Russia	31.16
VII.	Germany	31.10
VIII.	France	25.01
IX.	New Zealand	21.79
X.	Turkey	21.53

Source: <https://blog.bizvibe.com/blog/top-dairy-companies>

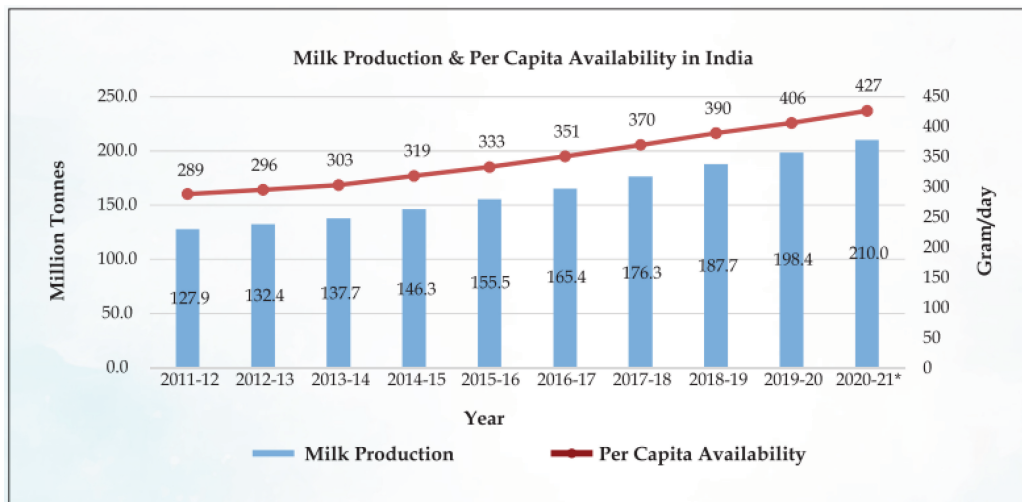
dairy marketing brand from Karnataka and in third position, Delhi, with the Mother Dairy Unit.

## Review of literature

1. Saravanadurai and Muthuaraj (2) have discussed about the dairying industry, how traditionally it is connected with Indian rural farming and how cattle have become an integral part of human life. The authors have also identified the contribution of milk to the country's national economy when compared with other agricultural products. In order to identify the performance of DCS, they have selected Akkarapalayam Panchayat. The study has been conducted with the help of primary and secondary data.

The authors highlighted how important dairy farming is to the lives of small and medium farmers and how beneficial it is to market the milk with the help of DCS. The authors have also identified the constraints of DCS, likes lack of leadership, no proper professionalism, problems of management, improper government control, work culture, environment, etc.

2. Beulah (3) conducted the study with the aim of determining consumer preferences and their attitudes toward digital marketing and e-marketing of dairy products. The author also says that while marketing dairy products, it is crucial to identify the competition and target market. The author also explains that by creating various criteria, the dairy industry can understand which criteria are important, and based on that, advertisements can be conducted to reach the target market. Communications related to the product will be shifted to digitalization, and this advertisement will become the main factor in increasing sales.
3. Shanthi (4) conducted an examination related to the customers conduct of non-rural family units in the



**FIGURE 1** | Chart on growth of milk production in India from 2011 to 2021. Source: <https://dahd.nic.in/>.

liquid milk showcase with reference to the Coimbatore locale and also tried hard to distinguish the liquid milk utilization and examples of usage by the families concerning the value, advancement, and dispersion of liquid milk. During the investigation, the author observed that customers' attitudes always depend on the brand they select along with the good fat content of milk, and it is also observed that the less quality of milk statement of attitude made by customers is due to the purchase of similar brands for a long time, and the segmented dairies showcase purified marked liquid milk.

4. Das (5) highlighted the situation of COVID-19 and lockdown, how lockdown relaxation has shown an impact on rural economies and guidelines that were laid down by the government to follow distance maintenance between humans. In the study, it was also observed the refusal of Central government authorities during this tough time. Here, the author explained how well dairy industries have overcome this problem during situations like COVID-19.
5. Abid and Jie (6) discussed about the impact of the pandemic situation on the agriculture-related food market. During this situation, lockdown imposed on human life showcased a high amount of pressure on business activity related to all sectors, but mainly the agricultural sector, where agricultural goods are perishable, and here it was observed that even demand and supply gaps were affected. In their paper, the authors identify the SWOT factors involved in the current study. In this study, the main aim of the study was to bridge the stringent relationship between consumer and supplier along with government interference and digitalization.
6. Wang et al. (7) have decided to point out new policies that have to be adopted by understanding the impact

of the COVID-19 situation in order to ease the dairy industry's business. Since the authors are from China, they have collected data for the study from China and the United States in order to make comparisons between the countries supply chain management and workforce during lockdown.

## Objective of the study

This study aimed to identify the emerging technologies and recent trends in DCS in the present post-COVID-19 situation.

- This study defines SWOC analysis on DCS in order to get adopted to the emerging technologies in dairy marketing business.
- To understand both the traditional and modernized ways of marketing of milk.
- The authors will also provide suggestions that DCS should implement in the recent era in order to make use of the present situation to make dairy marketing businesses successful.

## SWOC analysis on marketing of milk through DCS

SWOC analysis deals with identifying organizations strengths, weaknesses, opportunities, and threats, and it helps in framing future strategies for organization.

**TABLE 2 |** List of dairy cooperative brands in India:

Sl. No	State	Dairy Cooperative Brands
1	Gujarat	Anand Milk Union Ltd. (AMUL)
2	Karnataka	Nandini
3	Delhi	Mother Dairy
4	Gujarat	Dudhsagar Dairy - Mehsana
5	Maharashtra	Dynamix Dairies
6	Kerala	Milma Milk
7	Tamil Nadu	Avin Milk
8	Madhya Pradesh	Sanchi Milk
9	Orissa	OMFED Milk
10	Bihar	Sudha Dairy

Source: <https://www.walkthroughindia.com/grocery/top-15-most-popular-dairy-companies-in-india/>

### Strengths involved in marketing of milk through DCS

- **Online platform:** Dairy Cooperative Societies has developed online applications that make it easy for farmers and marketing teams to keep track of their day-to-day transactions.
- **Procurement of milk from farmers:** Dairy Cooperative Societies procures milk from farmers consistently on a daily basis.
- **Fair remunerative prices:** Dairy Cooperative Societies helps farmers in getting fair remunerative prices for their produce.
- **Easy reach of consumers:** Marketing of milk through DCS helps in reaching consumers in all geographical locations.
- **DCS builds trust among consumers:** Since DCS is registered under government bodies, it builds trust among consumers.
- **Affordable prices:** Dairy Cooperative Societies helps consumers in getting products at affordable prices.
- **Technical and medical assistance:** Dairy Cooperative Societies also provides great technical and medical assistance for farmers in order to enhance their produce.

### Weaknesses involved in marketing of milk through DCS

- **Provides less price for farmers:** Farmers who supply milk to DCS end up getting lower rates for their produce, whereas private dairy processing companies pay the maximum.
- **Does not give importance to customer needs and satisfaction:** Customer feedback and satisfaction are not given much importance by DCS.

- **DCS lacks quality:** Not much importance is given to maintaining greater quality of produce by DCS when compared with Private Milk processing companies.
- **No fixed time frame for making payments:** DCS fails to make payments to farmers on time.
- **No proper advertising media:** Advertising campaigns conducted by cooperative societies are not as effective as those conducted by private companies.

### Opportunities involved in marketing of milk through DCS

- **Digitalization:** Digitalization is a platform that is emerging at the fastest rate in all business sectors. DCS has a huge opportunity to make use of this platform in order to make information flow smoothly at all levels, from the farmer to the customer.
- **Establishment of village-level cooperative societies:** Dairy Cooperative Societies provides wide opportunities to farmers in all villages to supply their milk at fair prices to the cooperative societies established in the village.
- **Retail outlets:** Dairy Cooperative Societies helps retailers in opening outlets for dairy products.
- **Proper transport and warehouse facilities:** Dairy Cooperative Societies can enter markets throughout the country with the help of proper transport and warehouse facilities.
- **Various marketing channels:** Dairy Cooperative Societies has the opportunity to make use of various marketing channels in order to market their produce.
- **Opportunity to build trust:** Dairy Cooperative Societies still has an opportunity to become more competitive in the market since cooperative societies will be the most trusted brands in the market when compared with private companies.

### Challenges involved in marketing of milk through DCS

- **Perishability:** Milk is a highly perishable product when compared with any other product.
- **No proper transport facility:** Weak transportation facility involved by DCS.
- **Lack of proper maintenance and quality produce:** Unhealthy or unhygienic practice of procuring milk at village level by DCS.
- **No proper marketing strategists:** Lack of proper marketing strategists involved in DCS.
- **Competition:** Huge competition from the private sector in the dairy Industry.

## Traditional and modern way of marketing of milk in dairy industries of India

India has seen huge transformations in dairy sector since the 20th century, whereas decades ago India suffered with less production of milk, and today India stands at the no. 1 producer of milk in the world. When compared with many countries outside who perform shortcuts of using steroids for maximum production of milk, India still believes in increasing the number of cattle and producing milk through organic farming, and most of the producers involved in dairy farming come from rural sector of India.

### Traditional practices of marketing of milk

Previous studies reveal that the majority of producers of milk used to follow the traditional way of marketing milk.

- Marketing of milk directly to households.
- Marketing of milk directly to local sweet stalls.
- Marketing of milk to small-scale processing units.
- Marketing of milk to middlemen.
- Door-to-door delivery of milk.

In the traditional way of marketing of milk, people from rural areas who produce milk used to supply milk to consumers at their doorsteps, or even consumers used to reach farmers houses to procure milk directly. Hence, dairying is considered a rural neighborhood occupation.

### Emerging technologies and modern (post-COVID-19) practices of marketing of milk

In recent times, there has been a huge difference in the marketing of milk by dairy sectors due to the COVID-19 situation and many emerging technologies. A few of the modern practices are as follows:

- In recent times, online applications developed by DCS have played a major role.
- Customers have started placing orders for dairy products directly through online application portals.
- Farmers will have track of their entire supply quantity through online applications.
- Marketing team will have complete information about stock availability and targets through online applications.
- Through digitalization or adaptation of online application, it will become easier for suppliers and customers to keep track of their monetary transactions.

- Marketing of milk through DCS.
- Marketing of milk through private firms that process the milk.
- Marketing of milk through online shopping portals.
- Establishing warehousing in all suitable geographical locations and marketing the milk.
- Opening retail outlets in order to market the milk.

In modern marketing or in recent trends, farmers who produce milk have adopted new ways in which milk will be supplied directly to milk processing DCS. Here, processed milk will be packed in various quantities with different qualities depending on the customer's needs, and then dairy products will be marketed and supplied to consumers through various channels like wholesaler, retailer and various online supply portals that have been started in recent times.

**Figure 2** shows self-explanatory, which speaks about the procurement of milk from the farmers at village-level cooperative societies that in return provide fair remunerative prices to farmers, and village-level cooperative societies supply the same procured milk to district cooperative societies where processing of milk happens, and finished products will be supplied to warehouse. With the help of logistics and transport departments, marketing agents take this forward with the distribution network to the retail outlets, where consumers purchase the milk for consumption.

### The role of DCS in delivering efficiency

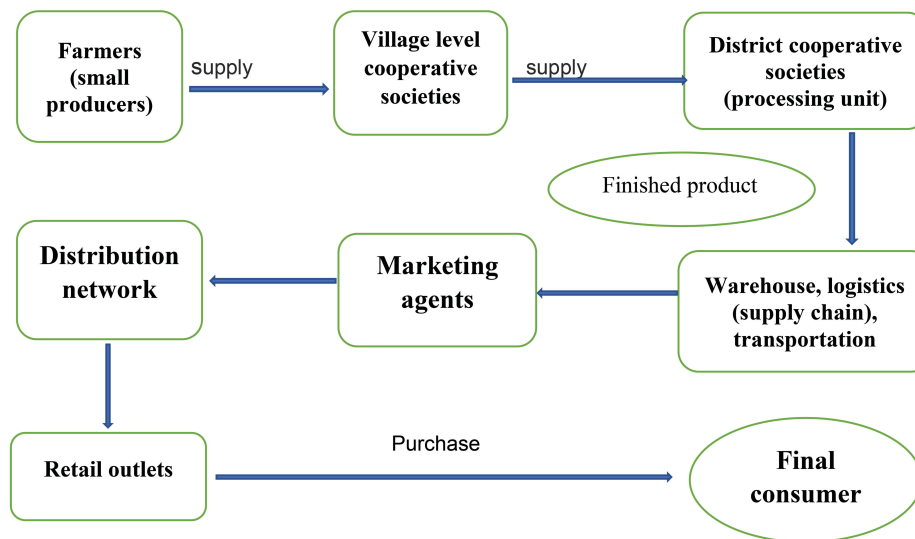
Dairy Cooperative Societies started with the motive of establishing a bigger sector of dairy development programs in India in order to make India self-sufficient with milk production and provide employment to rural people by encouraging them to get involved in the dairy sector.

As of now, DCS is well established in the country and is focusing on giving support and assistance to the farmers and delivering quality milk to the consumers.

### Few activities conducted by DCS

- Providing training for dairy farmers regarding the management of cattle health.
- Dairy Cooperative Societies supplies milk at affordable prices when compared with private dairy companies.
- Supporting farmers with fair, remunerative prices for their produce.
- Supporting farmers with incentives based on the quality of their produce.
- Dairy Cooperative Societies provides schemes for the development of rural women who are involved in dairy farming.
- Dairy Cooperative Societies also conducts artificial insemination programs for cows.





**FIGURE 2** | Conceptual model of processing of milk from farmer to consumer. Source: Authors (self-explanatory diagram).

- Dairy Cooperative Societies supports farmers by providing fodder for cattle.
- Dairy Cooperative Societies also started online payments to the farmers in order to avoid problems with corruption.

## Findings and suggestive measures to be taken by the DCS

Suggestions basically refer to the few techniques that DCS should bring in order to make the business more successful.

1. Dairy Cooperative Societies has become a centralized body of administration where all the decisions related to it happen at District headquarter. The need of the hour is to transfer the administration level from district to village level cooperative societies.
2. Dairy Cooperative Societies should make full use of Digital Shakthi to make the entire dairy business cycle process easier and flexible, so that all individual involvements will be kept informed about all developments and changes in the DCS cycle.
3. Dairy Cooperative Societies needs to understand and do surveys based on knowing the needs of consumers and customers first.
4. Since there are two different types of customers at DCS: business holders who purchase more quantities like bakeries, sweet shops, hotels, etc., DCS should have separate packages of milk products at separate prices. In the same way, the second type of consumer is the final household which purchases less quantity of milk.
5. Dairy Cooperative Societies should go in-depth into understanding the problems faced by farmers in cattle rearing.
6. Dairy Cooperative Societies should be prepared with reserves of fodder for cattle during times of drought and flood.
7. Dairy Cooperative Societies should ensure the presence of cattle health caretakers in every village.
8. Dairy Cooperative Societies should improve levels of hygiene and cleanliness since milk is a perishable good.
9. Dairy Cooperative Societies should increase the number of milk-carrying canters and storage centers in order to procure more milk and maintain sufficient stock.
10. Dairy Cooperative Societies should implement door-to-door delivery of milk from the outlets established at various centers.
11. Dairy Cooperative Societies should create more job opportunities for unemployed youth and make use of them to improve the business.

## Conclusion

The authors have tried to understand the emerging technologies that are existing in the marketing of milk through DCS, and this study has discussed about the root cause of establishing dairy industries in India and also about the beginning of DCS in India and its various transformations and today's digitalization in the same. The study is purely conceptual, with a few tables related to the statistical information of secondary sources of data, and the entire study has been prepared with the same source after doing a review of the literature.

SWOC analysis has been used in this particular study to understand the strengths, weaknesses, opportunities and challenges involved in marketing of milk with the help

of DCS, and the authors have also identified emerging technologies and trends in DCS. Traditional ways of marketing of milk and post-COVID-19 modernized and digitalized ways of marketing of milk are also discussed by the authors to give comparative information on the marketing of milk in past and recent times. It is observed that a conceptual model has been developed by the authors in order to make the process easier to understand about the flow of milk from the producer to the final consumer.

During the study, the authors have identified a few major challenges faced by dairy marketing industries, since milk is a highly perishable product. To resolve these problems, the authors in this study have plotted a few supportive suggestions for DCS to become successful in the marketing of milk.

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