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SUPPLY CHAIN PRACTICES OF DAIRY INDUSTRY- A REVIEW

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ABSTRACT

From farm to fridge, milk is the only product that is consumed literally by every household of an economy. Dairy products have gained lot of significance, due to the increased health consciousness among public. Milk is considered as highly nutritive since it is rich of protein. From just born to old aged, milk is preferred by everyone and as such it requires uninterrupted flow of milk from dairy farm to the door steps of consumers. Hence, there is a definite requirement of an effective supply chain practice in the dairy sector. Since Indian dairy Industry is the largest in the world economy, it is composed of millions of milk producers, thousands of chilling units and packing units. The present article is an attempt to review some of the major research studies made on the concept of "Supply chain practices of Indian dairy industry". A total of 24 articles published so far in different national and international journals during the period 1987 to 2015 have been reviewed and their essence is presented here.

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INTRODUCTION

The value of dairying in a nation like India hardly ever desires emphasizing. India has immense assets of cattle, which play an important role in the country wide economy and also in the socioeconomic development of millions of rural households. India has one of the biggest stocks of cattle and buffaloes: greater than 50 % of the world's buffaloes and 20 % of its cattle. The Indian dairy sector contributes a gigantic share of the agricultural gross domestic product (GDP). Despite the fact that the contribution of agriculture and allied sectors to the national GDP has declined during the earlier few many years, the contribution of the farm animals sector has elevated from not up to 5 % within the early 1980s to over 6 % within the late 1990s. Milk and milk products represent the most important share of the value of output from the farm animals sector; their share accelerated from lower than 50 % in 1950-51 to about 65% within the late 90s.

OBJECTIVE OF THE STUDY

The basic purpose of the study is

- To have an outline of Supply chain practices of dairy industry.
- To understand the phases involved in dairy supply chain.

- The study is carried out to understand the extent of the research work carried out in the field and understand the uncovered issues, if any that can pave the path for additional research in the field.

RESEARCH METHODOLOGY

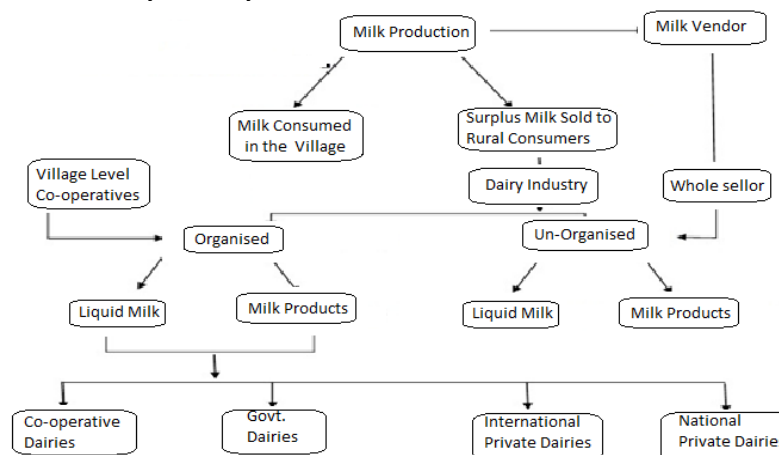
The study is based on existing literature extracted from different databases. This is a qualitative study aimed to recognize the issues related to Indian dairy industry, the supply chain practices followed by dairy units both in cooperative and private sector. The articles are gathered from different databases like J-gate Plus, EBSCO host.com, Google Scholar and Google. The basic purpose is to understand how an economy like India which once suffered from insufficiency of milk has now become not only self-sufficient but also a country which got the potential to export milk products to global market. The review is based on 24 articles gathered, to identify and analyze the marketing as well as other supply chain practices followed by dairy units.

Milk is a highly perishable commodity and as such procuring high quality milk from dairy farmers, their prompt processing, pasteurization and packing milk, producing milk products like paneer, doodhpeda, lussyetc all need an excellent coordination between different agencies involved in supply chain.

The concept of supply chain management is based totally on core thoughts. The primary is that practically every product that reaches an ultimate consumer represents the cumulative attempt of different organizations. Those organizations are mentioned collectively as the supply chain. The second concept is that whilst supply chains have existed for a long time, most companies have paid interest to what was occurring within their "4 partitions." Few organizations understood, much less managed, the complete chain of efforts that in the long run delivered merchandise to the very last customer. The end result was disjointed and regularly ineffective supply chains.

The corporations that make up the supply chain are "linked" together by means of physical flows and information flows. Physical flows involve the transformation, action, and storage of items and materials. They are the most obvious section of the supply chain. However simply as major are knowledge flows. Knowledge flows allow the relatively a lot of supply chain partners to coordinate their long-term plans, and to control the everyday flow of items and material up and down the supply chain.

Supply chain of Indian Dairy Industry



However, measuring the effectiveness of dairy supply chain is also very crucial in order to enhance the competitiveness and differential advantage of any firm through cost reduction and customer satisfaction. Thus, the present study aims at reviewing the research done so far on supply chain management practices adopted by Indian dairy firms.

Review of literature on Supply chain management practices followed in dairy industry.

Dr. N. MariMuthu and Dr. M. Subbarayulu(1987)^[1], in their article, studied the problems pertaining to dairy industry under different heads namely problems related to milk producers society Organisation setup, Problems related to Feeding system, Problems related to Breeding system, Problems related to Management system, Problems related to Health Input System, Problems related to Milk production system, Problems related to Milk marketing system,etc and stated that there is an excess availability of unproductive milchi animals and felt that fodder problem poses a real challenge to dairy industry.

K. Rajendran and Samarendu Mohanty (2004) et al^[2], in their article found that most of the dairy farmers are in unorganized sector and as such they are confronted with some problems such as; low productivity; insufficient and improper animal feeding and health care; lack of an assured year-long remunerative producer price for milk; poor provision of infrastructural facilities for procurement, processing and marketing of milk and milk products

Manojkumar, et al (2007)^[3] in his study focused on developing a mathematical optimization approach for lot sizing decisions with a view to coordinating multiple milk collection centres, and the paper also discussed the strengths, weaknesses, threats and opportunities of Indian dairy supply chain.

Dr. Santosh Singh Bais, Prof. Ramesh B. Agadi (2008)^[4] et al in their research, investigated the demand and supply of the dairy milk in Gulbarga. The authors identified that marketplace for milk was determined quality is more important than price to market milk and because of this aspect loose milk is replaced by branded milk in many parts of the study area.

N. Rangasamy and J.P. Dhaka et al (2008)^[5], in their study, compared the marketing practices of dairy units in both the sectors. The study also compared the prices of flavored and unflavored milk in both the sectors. The study concluded that the marginal returns of marketing dairy products are higher in private sector than in cooperative sector. The study suggested that cooperative societies in dairy industry should focus on customer-driven approach to launch variety of dairy products.

Anjani Kumar et al (2010)^[6] in his study examined the different alternatives of milk chains and their impact on milk producers. The data collected through field surveys was used to estimate the costs and benefits for different stakeholders in milk supply chain, viz. milk producers, traders and processors. Partial budget analysis was carried out to estimate and compare costs and returns of these stakeholders. Quantities of inputs used and output obtained, marketed and consumed were calculated as the mean of sample households in the survey area. The study observed that the profit margin of those farmers who are adopting modern channels for marketing milk supply chain is more than that of others because of their ability to follow modern practices to run their farming activity which helped them to reduce cost of producing milk.

M. Rajnikanth et al (2010)^[7], in their study examined the product portfolio of the union, the marketing strategies of the cooperative society, and the training programs conducted for the staff etc. The article concluded that the women co-operative dairy society has been contributing to the empowerment of rural women in the district.

Anjanikumar, Stevenstael, and Dhiraj K. et al (2011)^[8] in their research work studied the diversity of milk production and milk marketing in Bihar and Punjab. The authors felt that unlike in many other developing countries, milk production in India is dominated by smallholder producers with a few buffaloes or cattle, in systems closely integrated into agricultural production through use of crop residues such as straw of rice and wheat. Landless, marginal and small landholders accounted for 64 % of the total milk production and 69 % of the marketed milk in Bihar. In Punjab, the share of landless, marginal and small landholders taken together was only 39 %, indicating increasing commercialization of dairying in this state; their share in marketed milk was about 33 %.

Ashraf Imam, M N Zadeh, and Laxmi Rani Dubey et al (2011)^[9] studied the Dairy farmers want instant solutions to maintain their competitiveness and access to international markets and for this we need innovation which is main to keep a unified approach and adapts to the altering nature of the persons worried. The article reveals that lack of qualitative milk and terrible yield from milchi animals are the important reasons hindering Indian dairy farmers to resist international competitors.

Pramod Kumar Mishra, Prof. B. Raja Shekhar (2011)^[10] et al in their work, studied the various risks and uncertainties from a dairy industry perspective and their impact at various stages of the supply chain. Mostly survey based research method has been adopted to gather information from various stakeholders in the system along with in-depth personal interviews with the corporate authorities. It is estimated that only about 5 percent of the milk market is handled by the organized sector in Orissa and the rest 95 percent of the market is unorganized. Lower involvement of the milk producers in the societies brings down collections and lower level of collection due to low production increase the cost of collections and decrease profit substantially thereto.

A. V. Manjunatha, M.K. GanaShruty, V..Ramachandra et al (2013)^[11], highlighted the importance of dairy marketing systems, and compared the dairy marketing systems of various developing countries including India.

Dr. Gouri Krishna Saha, (2014)^[12] identified a number of problems faced by the milk farmers. The major problems faced by the milk farmers include small herd strengths, small land holdings, shortages of green and dry fodder, low productivity of animals, non-availability of timely inputs for breeding, feeding and health care of animals, lack of suitable education/training for skill development for new viable and sustainable technology, inadequate finances, poor rural infrastructure facilities and lack of proper marketing support for their produce.

Mrs. B. Jayalakshmi, Dr. S.Senthil Kumar, et al (2014)^[13], examined the milk consumption patterns in India, role of Tamilnadu dairy development department and its functions. The authors concluded that India would definitely be a place for FDIs and other large-scale investments in dairy sector. Vijay Paul Sharma, (2015)^[14] et al studied the determinants of smallholder milk producers' participation in modern supply chains, the impact of this participation on growth of smallholder milk producers in terms of farmers' income, production, and technology choices and concluded that Market infrastructure such as road, provision of veterinary services, distance from milk collection centre, markets, price risks, etc. are found to have significant effects on farmers' marketing choices.

Devulapalli Raghava et al, (2015)^[15] conducted a sample survey in Guntur district of AP with a view to observe the promotional tools and techniques followed by dairy units, channels of distribution followed by them and concluded that both private and cooperative dairy units have to take rigorous measures to advertise their products and make efforts to improve quality of milk products.

Dr. P. Amalanathan, Dr. S. Naseer Mohamed Jaffer (2015)^[16] et al in their research, studied the problems faced by the Members of Primary Dairy Co-operatives in Pondicherry, data were collected from the producers of milk residing in the villages of Union Territory of Pondicherry which consists of four regions namely Pondicherry, Karaikal, Mahe, and Yanam. The study concluded that the Government must initiate steps to manufacture various end products of milk like Padas, pannier, packed curd, quality butter milk which may become sometimes as alternative to other soft drinks in the market in hot countries like ours.

From the above review of literature on supply chain management practices of dairy industry, the following issues and challenges are identified.

Issues and Challenges at the Procurement Stage

1. Meeting seasonal variations in demand and ability to measure the quality of procured milk at the source.
2. Complexity of understanding logic of payments to producers based on fat, solid non-fat (SNF) and quality of milk received.
3. Keeping track of transport vehicles, as well as capabilities for viewing, monitoring and payment based on route or distance.
4. Monitoring the expiry dates and stock-outs of raw material.

Issues and Challenges at the Processing and Standardization Stage

1. Manual and tedious processes for milk standardization, calculation, handling production planning based on nonstandard raw material, addressing growing food concerns from consumers.
2. FAT accounting and effective tracking of FAT loss in the production process.

Issues and Challenges at Dairy Farmers level

1. Lack of veterinary services
2. Low yield of milch animals
3. Exploitation of farmers by chilling and packing units
4. High production costs
5. Delayed payment of money
6. Insufficient feeding of animals
7. Lack of chilling capacities

Issues and Challenges at Collection Centres Level

1. Milk base mainly consisting of small holders

2. Involvement of too many intermediaries
3. Distorted information
4. Absence of a screening system
5. Lack of Infrastructure
6. Manipulation of the quality of milk by the farmers

Problems and challenges on the Processing level degree

1. Seasonality of production and fluctuating supply and too much version in milk availability
2. Absence high-quality standards
3. Adulteration and food safety
4. lack of skilled and professional worker

Troubles and challenges at the storage and Logistics level

1. loss of cold storage centers
2. Gap inside the cold chain and transport facilities

Issues and Challenges at the Co-operative Level

1. Less number of member farmers
2. Limited participation in the decision making process
3. Losses
4. Low prices of milk
5. Inefficient services
6. Insufficient Infrastructure
7. Lack of demand for milk products in rural and sub-urban areas.

Issues and challenges for Marketing

1. Majority of the Market is still unorganized
2. Acceptability of the Consumer base
3. Less penetration to the rural Market
4. Lack of transparent milk pricing system.

CONCLUSION

The above review of literature on supply chain management practices in Indian dairy industry reveals that though ample research work has been done so far to address the supply chain issues and challenges , especially those that are faced by cooperative sector dairy units, a clear cut diversification of the issue with respect to cooperative sector and private sector dairies has not yet been pursued by any researcher till today. Since cooperative dairy units and private sector dairy units operate under different frameworks, it is felt that there is a scope to study and examine the supply chain challenges of dairy units operating in private sector.

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