CHAPTER – 2

REVIEW OF LITERATURE

2.1 Introduction

The review of literature is broadly divided into two parts – Theoretical Framework and Empirical Studies. The theoretical concepts regarding Quality Management, Marketing Mix and Supply Chain Management are connected with this study and have been explained in detail. The review of existing literature pertaining to the research study enables one to analyze the research carried out in different dimensions. With the help of the same, the gaps in that particular area can be identified. Many studies have been conducted in the field of milk quality, organization of dairy cooperatives and consumer satisfaction of the milk consumers. A review of these studies is summarized below and is divided in four parts. The first part deals with the review of literature regarding milk cooperative movements and the contribution of milk cooperatives to the economy. The second part covers the Quality Management System adopted by the milk dairies and the quality initiatives adopted by milk industry. The third part is about the logistics and supply chain aspects of the milk industry. The fourth part deals with the consumer requirements and satisfaction of the milk consumers.

2.2. Theoretical and Conceptual Framework

2.2.1. Theoretical Framework – Marketing Mix

The theoretical framework is developed based on the research work done by A. Parasuraman, Leonard L Berry and Valeria Zeithaml who are the pioneers in
developing Service Quality Models. The seven ‘P’s of Services Marketing have also been considered in constructing this framework.

The theoretical framework is depicted in diagram 1 below.

Diagram 1: Theoretical Framework

Source: Derived from Seven Ps of Services Marketing by Zeithaml, Parasuraman and Berry.

The four ‘P’s of Marketing are Product, Price, Promotion and Place. The extended three ‘P’s of Services Marketing as applicable in this study are Physical Evidence,
Process and Packaging. The four ‘A’s corresponding to the four ‘P’s as defined by Marketing Guru Jagdish Sheth are Availability, Affordability, Awareness and Accessibility. The above model for the purposes of this study revolves around the above Marketing Mix. It is very important that the customer is assured of availability of the milk at all times at prices affordable by them. The accessibility in terms of getting the milk in nearby outlets and also the awareness about the various product mix is also equally important. The process in terms of hygiene and other factors, the packaging both in terms of quality as well as different SKUs and also the physical distribution in terms of proper logistics are all important from the viewpoint of customer satisfaction.

2.2.2. Conceptual Framework - Quality Systems – ISO 9000

All quality management systems are based on eight quality management principles. The quality management principles are comprehensive and fundamental rules for leading and operating an organization, aimed at continually improving performance over long term by focusing on customers while addressing the needs of all other stakeholders.

Customer focus – Organizations depends on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

Leadership – Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization’s objectives.
Involvement of people – People at all levels is the essence of an organization and their full involvement enables their abilities to be used for the organization’s benefit.

Process approach – A desired result is achieved more efficiently when related resources and activities are managed as processes and not as independent departments or functional areas. For each process, one has to identify the input process, the output process, the activities in the particular process, the resources required and the measurement items and control methods.

System approach to management – Identifying, understanding and managing interrelated processes as a system contributes to the organization’s effectiveness and efficiency in achieving its objectives.

Continual improvement – Of the organization’s overall performance should be a permanent objective of the organization.

Factual approach to decision making – Effective decisions is based on the analysis of data and information.

Mutually beneficial supplier relationships – An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value. Although it talks about relationships with suppliers, we can also extend it to mutually beneficial dealer relationships which are particularly applicable to automobile organizations, consumer durables organizations and other organizations having a wide network of dealers.

It is very important that these 8 principles are borne in mind when applying the requirements in Quality Systems as the purpose of the requirement can often be better
understood. As an auditor of quality management system it will also be advantageous to keep these principles uppermost in the mind as the spirit of these principles should be able to be seen within the organization being audited.

The implementation of quality management systems can bring in lot of improvements as well as benefits to the organization, some of which are:

1. Uniformity

   In today’s world of intense competition, globalization and electronic connectivity, a common internationally accepted standard facilitates exchange of goods & services worldwide.

2. Assurance of product quality

   Through proper implementation of the systems at all stages coupled with high standards of discipline in working in an organization, the outgoing product/service quality is assured automatically.

   The concept of implementing quality systems now extends beyond the organizations themselves and it includes the other partners in the supply chain i.e. the suppliers on the one side and the dealers on the other side.

3. Improvement in market share.

   An organization that obtains an international quality system certification gets known in the market place which helps the organization in improving their market share.

4. Disciplined approach

   Perhaps the most important benefit of implementing quality systems is the total disciplined approach adopted by all the employees in the organization in all their
activities at all times. In short the organization and the people tend to adopt this as a way of life and it reflects very much on their quality of life.

5. Export advantage

For exporting to the European countries, an international quality system certification is mandatory.

The International Organization for Standardization (ISO) was founded in 1946 in Geneva, Switzerland. Its mandate is to promote the development of international standards to facilitate the exchange of goods and services worldwide. Today there are over 160 member countries.


This international standard does not include requirements specific to other management systems, such as those particular to environmental management, occupational health and safety management, food quality management and financial or risk management. However, this international standard enables an organization to align or integrate its own quality management system with related management system requirements.

This international standard specifies requirements for a quality management system where an organization

a). Needs to demonstrate its ability to consistently provide products/services that meets customer and applicable regulatory requirements, and
b). Aims to enhance customer satisfaction through the effective application of the system, including the process of continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.

Most standards follow a four tier documentation which can be expressed diagrammatically as follows:

![Quality Documentation Pyramid](image)

Source: ISO documentation.

The Apex Manual or Quality Manual is for the organization as a whole and talks about the organization profile, scope, quality policy and objectives, the responsibility matrix and other issues common to all the areas of the organization. The copy of the quality manual is available with the MR and very few top level personnel in the organization. The others can also access and go through the manual available with the MR or other persons. The quality manual serves as an overall guide for implementation of the QMS.
The department procedures or process mapping is specific to the respective areas and a copy of the same will be available with the respective process owners apart from the MR. Instead of writing descriptive procedures, the trend these days is to map in the form of a flow chart which will indicate the activities carried out in the particular process. To the left and right will be mentioned the names of the input and output processes respectively. The resources required for the particular activity and also the quantified items for monitoring and measurement of the results versus the objectives of the particular process will also be mentioned in the process mapping.

The work instructions will be in the form of guidelines and only the points will be mentioned in the form of steps. It is mainly for the frontline staff and usually will be in the local language. These work instructions will be displayed prominently in the workplace.

Formats are pre-structured blank sheets where the data is filled. The formats are required to ensure standardization and uniformity in the organization. Once the data is filled in the formats, it becomes records. In case of records, they can not be altered after sometime. Also the retention period has to be mentioned in the procedures. Formats are given format numbers and whenever any revision is required, it can be done but the old formats available with all the persons in the organization are immediately withdrawn from use.

The MR i.e. management representative is responsible for conducting internal audits and management review meetings. The structured conducting of internal audits and
management review meetings and the level of involvement by the employees in the same determines the health of the quality management system.

Diagram 3

![Diagram of the quality management system]


The flow chart of ISO clearly shows the Input as well as the output with customer orientation in the 2000 version. All the activities in the organization should have a direct relation with the customer requirements and the value addition in the organization should have orientation towards customer satisfaction and exceeding customer expectations.

2.2.3. Conceptual Framework - Quality Systems –HACCP

This standard is a food safety standard, established by the U.S department of agriculture in 1998 and adopted by the Food and Drug Administration (FDA) of the United States.
HACCP has been endorsed by the National Academy of Sciences, the Codex Alimentarius Commission (an international food standard-setting organization) and the National Advisory Committee on Microbiological Criteria for Foods.

The major advantages of HACCP are:

- It is based on sound science.
- It reduces barriers to international trade.
- Enables food organizations to compete more effectively in the global market.
- Focuses on identifying and preventing food contaminations Hazards.
- The responsibility for ensuring food safety is defined on the food manufacturer and distributor.

HACCP involves seven steps.

1. Analyze Hazards

   The hazards could be biological, chemical, or physical and these hazards are identified along with the measures to control them.

2. Identify critical control points

   These are the points at which the potential hazard can be controlled or eliminated. The points start from the raw state through the process and finally shipping to the consumer.

3. Establish preventive measures with critical limits for each control point.

   The examples could be the cooking temperature, cooking time, type of cooking vessel etc.
4. Establish procedures to monitor the critical control points.

   Such procedures could be how to monitor the cooking time, temperature etc.

5. Establish corrective actions to be taken when monitoring shows that a critical limit has not been met.

   One example could be the decision on re-processing or disposal if the cooking time or temperature has not been met.

6. Establish procedures to verify that the system is working properly.

   For example, use of time and temperature recording devices to verify that a cooking unit is working properly.

7. Establish effective record keeping to document the HACCP system

   This includes records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems.

2.2.4. Conceptual Framework - Quality Systems – ISO 22000

ISO 22001:2005 specifies requirements for a food safety management system where an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. It is applicable to all organizations, regardless of size which is involved in any aspect of the food chain and wants to implement systems that consistently provide safe products. The ISO 22000 International Standard is a step ahead of HACCP and specifies the requirement for a food safety management system and it involves the following elements:

- Interactive communication
- System management
- Prerequisite programmes
- HACCP principles
Critical reviews of the above elements have been conducted by many scientists. Communication along the food chain is essential to ensure that all relevant food safety hazards are identified and adequately controlled at each step within the food chain. This implies communication between organizations both upstream and downstream in the food chain. Communication with customers and suppliers about identified hazards and control measures will assist in clarifying customer and supplier requirements. Recognition of the organization’s role and position within the food chain is essential to ensure effective interactive communication throughout the chain in order to deliver safe food product to the final consumer. The most effective food safety systems are established, operated and updated within the framework of a structured management system and incorporated into the overall management activities of the organization. This provides maximum benefit for the organization as well as all the stakeholders. ISO 22001 has been aligned with ISO 9001 in order to enhance the compatibility of the two standards. ISO 22001 can be applied independently of other management system standards or integrated with existing management system requirements.

ISO 22001 integrates the principles of the Hazard Analysis and Critical Control Point (HACCP) system and application steps developed by the Codex Alimentarius Commission. By means of auditable requirements, it combines the HACCP plan with prerequisite programmes. Hazard analysis is the key to an effective food safety management system, since conducting a hazard analysis assists in organizing the knowledge required to establish an effective combination of control measures. ISO 22001 requires that all hazards that may be reasonably expected to occur in the food chain, including hazards that may be associated with the type of process and facilities used, are
identified and assessed. Thus it provides the means to determine and document why certain identified hazards need to be controlled by a particular organization. During hazard analysis, the organization determines the strategy to be used to ensure hazard control by combining the prerequisite programmes and the HACCP plan.

The benefits of ISO 22001:2005 certification include:

- Clear communication across the entire supply chain
- Traceability – identification of an organization’s impact on food safety within the supply chain
- Cost reduction due to a more efficient system
- Continuous improved business performance in line with the ISO 2201 food safety policy and objectives.

2.2.5. Typical supply chain

A typical supply chain in manufacturing organizations can be represented diagrammatically as follows:

Diagram 4: Conventional supply chain diagram

**Flow of Materials**

[Diagram showing flow of materials with labels: Suppliers' Suppliers, Suppliers, Procurement, Operations, Distribution, Customers, Customers']

**Flow of Information**

Source: Derived from “Supply Chain Management” by Sunil Chopra and Peter Meindl.
2.2.6. Supply chain in Milk Industry

The supply chain in Milk Dairy Industry like KMF can be represented diagrammatically as follows:

Diagram 5: Milk Industry Supply Chain Diagram

Milk Flow

Farmers → VCS → DCS → KMFL

Milk Union Members

Consumers ← Retailers ← Distributors

Information Flow

Source: Derived from KMF brochure 2012

The farmers from the various districts reach the milk collection centre everyday in the morning and afternoon to sell the milk their cows/buffaloes have given in the morning and in the noon. All the milk procurement centres are equipped with computers and electronic milk testers (EMT). Efficient testing & measurement of milk constituents is ensured by EMTs.

Information flow is in both directions and is an essential part of this supply chain. Also usage of information technology and computers has become a way of life. The computers run the automatic milk collection system, which ensure immediate preparation
of milk payment bills, transparency of operations and greater efficiency of milk collection.

The milk is then sent to the chilling depots in each village of the member unions. The milk then reaches respective dairies where it is processed in an ultra modern dairy.

2.2.7. Typical Features of Milk Industry Supply Chain

Some of the features more specific to the logistics & supply chain in milk processing as opposed to the supply chain for engineering products are:

- The shelf life is very limited & hence the actions at each stage need to be coordinated very closely.
- Special refrigerated vehicles are required for the transportation of milk.
- People in the upstream of the supply chain i.e. the village co-operative members may not be highly educated & hence need to be treated with more care & personal attention.
- The time available in the last stage of the supply chain is also limited. Almost all the customers want the supply of milk at the same time.
- In case of quality problems like spoilage of milk at the customer end, it is difficult to identify whether it is the fault of the manufacturer or the distributor or the customer. Hence though there is reverse logistics in theory, it may not happen in practice frequently.
2.3. Literature Survey

2.3.1. Literature Survey – Milk Cooperatives Contribution to Economy

Dubey (1990) evaluated the external factors that were affecting the organizational efficiency of milk producers’ cooperatives societies. In their opinion organizational efficiency significantly depended on the size of milk producers’ cooperative society and supply of milk. As part of trade liberalization drive, market reforms can be introduced and the relaxation in licensing requirement can attract large number of private players to enter the dairy processing sector. The import duty on dairy products can also be brought down considerably. Technical innovation to increase animal performance from grazed grass, increasing herd genetic potential and developing labor efficient lower fixed cost systems are essential.

Sah A.K and Malik B.S (2005) in their paper on Entrepreneurship as Critical Input for Dairy Development brings home the facts that Entrepreneurship Development is crucial in harnessing vast untapped human resources in rural areas and this holds true in the field of dairy industry.

DII (2006), talks about India being a producer and not a consumer. India is the largest milk producer in the world, but consumes the least, with the country’s children being the most deprived, according to a report delivered in the Indian Parliament in 2006. Indians consume around a third of the average European intake, with statistics claiming 229 g per capita availability of milk in India per day as opposed to 887.7g in Switzerland. Meanwhile, milk production in India has increased over recent years, with over 90.7
million tonnes of milk produce during 2004-05. Low productivity of animals and large human population has been cited as the reason for the low per capita availability of milk.

Dobson W.D (2006) in his paper titled Drivers of Change in China’s Dairy Industry says that milk production in China rose by 25% per year from 2000 to 2006. He has identified the drivers of change as

(a) Income Growth.

(b) Pressures to Improve Efficiency of Milk Production.

(c) Pressures to Improve Quality of Milk and

(d) Potential Demand for Dairy Products in Rural Areas.

Kjoeller (2007) in the article on “Blending modernity with tradition” brings home the fact that with tighter quality control and new cooperative structures, India is defining itself as a world player in milk dairy sector. The cooperatives are the backbone of the Indian dairy industry but, despite having demonstrated how a commodity can be used as a tool for socio-economic development for the rural poor, regulations have held them back. The cooperatives in India are governed by archaic rules and regulations mostly originated during colonial rule. This is to a certain extent, adversely affecting the growth of cooperative dairying in India. Several methods are being deployed to ensure lesser control of government in the management of the cooperatives. Production cost, infrastructure and investments in education and training show good promise going forward. The infrastructure consists of 23 state federations 183 milk sheds and around 117,575 village cooperative societies over and above a national milk grid. There is a
network of nine dairy science colleges, 31 veterinary colleges and over 80 agricultural colleges and research institutes, affiliated to 28 state agricultural universities. The battle with quality and food safety has been a major problem for the industry. Most of the dairies are now seriously looking into the improvement of sanitary and hygiene conditions by adopting ISO certification as well as HACCP.

Sirohi et al (2009) identified The Supply Side Constraints for poor capacity utilization of the plants is low procurement of raw milk from the milk producers. The various factors contributing to this are Inept Procurement Pricing, Lack of Effective Milk Collection Network, and Absence of Non-price incentive. The Demand Side Constraints identified are Administrative Constraints, Shortcoming in Planning and Coordinations, Lack of Procurement and Marketing Strategy and Poor Human Resource Development and Lack of Coordination among Government Departments. On the basis of a large number of internal and external inhibiting factors responsible for the failure of formal milk processing sector in Assam, some important lessons can be drawn to bring this sector back on the track. First is the re-structuring of institutional arrangements for running the dairy plants and gradual withdrawal of the government from the same once the non-government agency is technically and financially equipped to handle all the operations of the plant. A majority of the dairy / chilling plants in Assam are under the direct control of the government, unlike the all India scenario. There has been a lack of commercial environment and orientation in managing the milk processing plants under the government control in the state. The government should play the role of a facilitator in linking the milk producers to the organized processing sector which is professionally managed by cooperatives, NGOs and private agencies. Frequent changes in the
institutional arrangement for procurement and marketing of milk create uncertainty for milk producers, shake their confidence in the organized sector and prompt them to look up towards unorganized channels for milk marketing. The re-structuring of existing institutional arrangements should go hand in hand with the efforts to tackle the demand and supply side constraints.

Dairy Industries International (2010) reviews the World scenario in milk and milk products. Probiotic products in India are expected to experience huge growth in the coming years, according to a report from Frost and Sullivan. Researchers have recently highlighted the potential for expansion within the country’s probiotic market, which is expected to experience yearly growth of 22.6 per cent until 2015. According to Frost and Sullivan, the Indian probiotic market is expected to be worth over Euro one million by 2015. A new branded milk product is being launched in India by Reliance Dairy Foods, a subsidiary of Reliance Retail. Life will be sold through general milk distributors and will be available in Haryana, Punjab, Andhra Pradesh, Tamil Nadu, Rajasthan, National Capital Region (NCR) and Himachal Pradesh. The Mukesh Ambani controlled company will continue to sell its existing Dairy Pure brand through Reliance Retail stores. Companies like Nestle India and Parag Milk Foods have also drawn up investment plans in an effort to keep themselves at the forefront of the milk distribution business which is growing 10-12 per cent a year. The U.S Department of Agriculture has issued new rules clarifying the production methods that must be used for cattle and dairy products to be deemed organic – in particular access to pasture. The rules require cattle to have year round access to pasture and to be out in pasture for at least 120 days a year. A minimum of 30 per cent of their feed should come from pasture.
Shah et al (2010) identified that the incremental dairy animal population as the important factor contributing to growth in milk production in Gujarat. In India, the state of Gujarat has historically been the front runner in milk production activities. One of the ways to assess significance of agriculture and livestock in the state economy is through their contributions to the gross state domestic product. It is found that livestock contributed around 23 per cent to the gross value of output of the combined agriculture and livestock sector in 2007-08. Since the successful implementation of Operation Flood program – one of the world’s largest and most successful dairy development programs – the country has been maintaining a secular growth of around 4 per cent per annum in milk production from 1990-91 to 2008-09, the increase in contribution of the Gujarat state to National milk production has been noteworthy. Relative share of the state in country’s milk production increased from 6.5 per cent in 1994 to 7.7 per cent in 2008. Similar to the rise in absolute production of milk, the per capita availability of milk has been constantly increasing in the state as well as the national level. In Gujarat Milk enjoys absolute importance within the livestock spectrum as 89 per cent of the total value of output from livestock comes from milk. Across species, buffaloes have been found to dominate in the central and northern regions of the state, while cows are in majority in the Saurashtra and Southern Regions. In recent years, in addition to buffaloes cross bred cows has been gaining importance in milk production, especially in the southern and northern regions of the state. The main driver of the growth in milk production in the state has largely been incremental number of animals distantly followed by in-milk yield. From a futuristic point of view, the results of elasticity of milk production have indicated
that yield of lactating animals is the common important factor across all species that needs to be paid attention for the sustenance of milk production growth in the state.

Sarker and Ghosh (2010) has observed that the dairy sub-sector occupies an important place in the agricultural economy of India as milk is the second largest agricultural commodity in contributing to GNP, next only to rice. In 2005, Indian milk production represented 14.6 per cent of the world milk production, exceeding the combined production of the top five dairy countries in the EU-25. More than 80% of the milk produced in the country is marketed by the unorganized sector (private organizations) and less than 20% is marketed by the organized sector (government or cooperative societies). Both organized and unorganized sectors in the dairy industry of the country face a lot of constraints – infrastructural, technical, socio – psychological, economic and marketing – with high or low severity to expansion of milk production in the country. The underlying hypothesis in the study is that the non-cooperative farms face major constraints and high severity compared with cooperative farms in expanding milk production. In this paper, the researchers assessed the nature and extent of relationship or association between three pairs of farms – good cooperative (GC) and good non-cooperative (GNC), bad cooperative (BC) and bad non-cooperative (BNC) and overall cooperative (OC) and overall non-cooperative (ONC)- based on each type of constraints – infrastructural constraints, economic constraints, marketing constraints, technical constraints and socio – psychological constraints – faced by milk producer members. Firstly, the nature of relationship between all pairs of farms for different types of constraints was positive, except for marketing constraints, the negative relationship for marketing constraints implies that opportunities of marketing are reversed between
cooperative and non-cooperative farms. Secondly, as regards positive association between different pairs of farms was concerned, it could not be inferred from the results that a particular pair of farms received highest incidence of positive relationship for four types of constraints. Between GC & GNC, the extent of positive relationship for technical constraints was highest and significant; for infrastructural constraints, though the positive relationship between GC and GNC was lowest, it was significant at 10 per cent level. On the other hand, for socio-psychological constraints, BC and BNC received the highest positive relationship and their relationship was significant for all types of farms. Thirdly, despite the fact that for the four types of constraints, the relationship between different pairs of farms was positive, the extent of positive relationship for economic constraints was very low and the relationship for all pairs of farms was statistically insignificant.

Chennakrishnan (2011) in his Market Survey article has observed that proper investment structure and strategies are required in dairy farming sector to turn it into an organized and profitable business. The per capita availability of milk in India has almost doubled from 132 grams per day in 1950-51 to 263 grams per day in 2009-10. The annual milk production in India has grown more than six times since independence. It has increased from 17 million tonnes in 1950-51 to 112 million tonnes in 2009-10. Though the production has increased many folds the productivity of animals is still low. The marketing systems are also not modernized or developed to a satisfactory level. Other issues in this sector are ineffective breeding programmes, limited availability and affordability of quality feed and fodder, improper veterinary infrastructure, lack of vaccination, inadequate access to formal credit mechanisms, inadequate research capacity and limited processing capacity. The estimated consumption of milk in India in 2021-22
is 180 million tonnes. It means that the milk production has to increase between 5.5 percent to 6 percent per annum in the next 12 years. If it fails to do so, they may need to resort to imports from the world market. A large consumer like India entering International market would have the potential to cause International prices to spurt. Only a strong supply response with focus on production and productivity can keep the prices stable.

Anjani Kumar (2011) brings home the fact that between 1970 and 2008 the share of livestock in agricultural gross domestic product (AgGDP), has risen from 17 percent to 29 percent dairying accounts for more than two thirds of the livestock output and is largely responsible for the rising importance of the livestock sector in the country. The growing middle class with increasing income and expanding urbanization are likely to boost the demand for more formally processed milk products, which the traditional markets generally do not cater for. This will fuel the growth of a modern, formal and organized milk market. Upstream segments of the milk marketing chain in India have evolved significantly, yet there is no clear and conclusive evidence that this is directly moving down to the farm gate. However, the modern milk supply chain appears to be inclusive and the resource – poor dairy farmers are not excluded from the modern milk supply chain. The traceability and food safety issues may further consolidate the position of modern milk supply chains and the existence of the traditional chain would be increasingly challenged. Further expansion of the modern milk supply chains by and large is dependent on the development of milk collection infrastructural facilities at the doorstep, incentive pricing and rewards for quality produce. Education positively and significantly affects the choice of milk marketing channels. Higher education generates
more awareness about the market opportunities and reflects better ability of the farmers to integrate with the modern milk supply chain. The price offered by the channels also induces the farmers to sell milk to a modern milk supply chain the marginal effect of price in the selection of modern milk supply chain is only 3 percent. The adoption of milk testing done by the modern milk supply chain positively affects the farmers’ choice of milk marketing outlet. The interpretation here is that milk testing adopted by the modern milk supply chain promotes differential pricing of milk and gives incentives to the farmers based on the quality of the produce. Enterprising commercial farmers are particularly motivated to sell to a modern marketing supply chain and can harness the opportunities of getting higher prices. The farmers producing higher volume of milk seek out channels that more easily accept larger and possibly more variable quantities of milk. However, again the effect of scale of production is not significant on the choice of milk marketing outlets, indicating the propensity of modern milk supply chain to include even the small scale producers. The support for installation of bulk milk coolers, automatic milk collection centres, and bucket milking machines, supply of hygiene kits, training of personnel involved in milk collection and handling are being vigorously pursued to ensure safety of milk.

Ling (2012) describes the many faces of cooperatives. The cooperative business model has many variations. The intrinsic cooperative structure entails the uniqueness of the cooperative’s organization, governance, equity financing and operation. The Unique Cooperative Structure is all about the dairy cooperatives representing aggregates of dairy farms, organized to market milk produced by members. Members’ farming operations are not under the cooperative’s administrative control. Therefore, the cooperative is neither a
horizontal integration of its member-farms nor a vertical integration between member–farms and the cooperative. It is a third mode of organizing coordination. The Unique Cooperative Organization means the cooperatives are business organizations of member–patrons. They can be of any size and can be local, regional or national in scope. As regards Unique Cooperative Governance the members of dairy cooperatives exercise ownership and business controls through a board of directors that is elected from among member-farmers. The board makes major decisions, sets the policy and determines the overall direction of the cooperatives for the management to follow in its day-to-day operations. Effective communication with members to foster sound governance is emphasized. The Unique Cooperative Equity Financing means the equity for dairy cooperatives is supplied and owned by members. The Unique Cooperative Operation—Being an aggregate of member-farms usually requires the cooperative to be the exclusive marketing agent of members’ milk. This operating mode entails its own unique economics that comprises the following elements: (1) the milk volume the cooperative has to handle continually fluctuates; (2) the cooperative does not have its own milk production functions, milk production cost curves, or milk supply curves; and (3) the mismatch between seasonal milk supply and demand requires cooperatives to handle the inevitable seasonal surplus milk volume at a substantial supply balancing cost.

Deepa (2012) talks about butter making just all things in life a little bit better. She observes that it is not just food that gets better with butter but history too. When independent India was in her teens, the milk production was very low and imports of milk powder were a necessity. Operation Flood, a scheme introduced by Dr. Verghese Kurien with the aim of flooding the country with dairy products was a grand success. This was
one of the world’s largest and most respected dairy development schemes to be undertaken with funding from World Food Program (WFP), European Economic Community (EEC) and the World Bank. The rural farmers’ cooperatives were organized at the village level and connected to the urban consumers in the form of a Milk Grid.

Liebrand (2012), talks about the National milk producers’ federation of USA observing that the success in dairy policy reform means working together to get something better than before. One of the main goals of NMPF was to explain to its members and guests how features of its Foundation for the Future program – which calls for major changes in the nation’s dairy program – became included in the proposed Dairy Security Act of 2011. Efforts by NMPF in the area of long term trade polices sought by dairy producers came to fruition with the passage of three Free Trade Agreements with Columbia, Panama and South Korea; allowing greater flexibility in truck traffic flow between the United States and Mexico; and the application of the national dairy check – off program for imported products under which importers of dairy products will be assessed 7.5 cents per hundredweight to help fund promotion and research.

Bindu et al (2012) has observed that dairying is envisaged as an important means of reinforcing the income for economically weaker sections of the society. The economic potential of dairying is clear from the fact that milk constitutes the most important source of nourishment for both vegetarian and non-vegetarian, for old and young alike. India has surplus cattle but a strategy has to be evolved for enhancing milk production by improving the quality of milch animals without adding to the number. One finding of the study was that cross breeds fared far better than local ones in all the aspects. Karnataka with milk production of 1.6 million tonnes in 2007-08 is 5th after Tamil Nadu,
Maharashtra, Punjab and Kerala. The immediate objectives identified by them are to increase milk production, augment rural incomes and transfer of milk from producers and enhance the profits of milk marketing. At present India is not able to compete with European countries and United States in export trade of dairy products because milk in these countries is highly subsidized. It is to be noted that the GATT Negotiations were for removal of these subsidies.

Henriksen et al (2012) found that the key to the success of Danish agriculture was an early diversification towards dairy production. Denmark’s success owed much to a prudent use of trade policy which favored dairy production. Using micro-level data from individual dairies, they quantified that the implied subsidy to dairy production from the tariffs ensured the profitability of individual dairies. By maintaining free trade, the Danes adhered to a national tradition of liberalism, a reflection of a small economy without any domestic mineral resources. Trade policy did, in fact, play a vital role in the early history of the Danish dairy industry. The traditional story tells how Denmark went through a long ‘crisis of grain sales’ of 1876 – 94, which stimulated a diversification of agriculture into dairy and meat production. The reasons given for why Danish agriculture succeeded in adapting to the challenges of the second half of the nineteenth century are as follows: firstly land reforms meant that holdings were large enough to be able to benefit from new technologies; secondly, peasant emancipation meant that decisions and financing could adjust more easily; thirdly, farmers enjoyed a high level of education; fourthly there were no grain tariffs, thus allowing the use of cheap grain for feeding the animals involved in dairy production; and fifthly, there was public support for research and research institutions. Transportation improvements in the 1860s facilitated export
breakthrough; and institutional and technological changes from the late 1870s, that is, the founding of cooperative dairies and the invention of the mechanical centrifuge for separating cream from milk, ensured the continued success of Danish agriculture. The invention in 1878 of the steam–powered centrifuge or automatic cream separator played a large role. This machine could remove nearly all the butterfat from cream instead of just two thirds, which was the average of more traditional methods. While this led to increases in the production and quality of butter and is considered one of the reasons for the rise of cooperative dairies. The article has documented the importance of Danish trade policy for the dairy industry. This support was substantial until 1864 and this might explain the early diversification of farmers towards dairy production. Denmark appears not so much as a liberal bastion in the last decades of the nineteenth century, and more as a shrewd utilize of seemingly innocuous trade policy instruments, providing indirect subsidies to its booming dairy industry in a way that only the most knowledgeable outside observer would have been able to recognize.

Ling (2012) describes the nature of cooperatives and their roles in economizing transaction cost for understanding the value of cooperative. Cooperatives are organized to achieve common goal using Organization, Governance, Equity Financing, Operations and Economics that are unique to cooperatives. Cooperatives have shown to be pro-market, helping farmers gain market access and exercise countervailing market power and serving as a competitive yardstick for their industry. In marketing milk and milk products, farmers and their cooperatives may engage in the following transaction scenarios. In a subsistence agricultural economy, farm production in excess of family consumption may be sold off farm. The transactions are incidental to subsistence
farming, do not require specific assets, and are primarily operations of a bygone era in the United States. Commercial milk production requires substantial capital investment in specialized assets: milk cows; barns, milking parlors and other buildings; machinery and equipment; skilled labor and management etc. Asset specificity, high product perishability and market volatility make dairy farmers vulnerable when dealing with milk buyers – usually dairy food processors. There are many dairy farmers, but a small number of milk processors. Processors must also deal with “asset specificity” – they own dairy plants that are capital and technology intensive and require large size to take advantage of the economies of scale. But they are in a dominant bargaining position vis-a-vis individual dairy farmers. The third scenario – for a highly perishable commodity such as milk, it is vitally important for both producers and processors to work together to make sure milk flow is smooth and without interruption. Producers need to have an assured outlet for the milk once it is produced, while processors require a steady supply of fresh milk to manufacture high quality dairy products and efficiently utilize plant capacity. The dairy industry has evolved in such a way that many dairy cooperative and processors have developed a high degree of bilateral dependency. Ling talks about scenario IV – Besides selling members’ milk to buyers (processors), it may be necessary for a dairy cooperative to forward – integrate into processing some or all of its members’ milk into various dairy products. Being marketers of members’ milk, many cooperatives have to maintain plant capacity to balance milk supply and manufacture reserve and surplus milk into storable products. Otherwise, the surplus milk will be at the mercy of the market and lead to depressed milk prices. The dairy cooperatives are categorized into four categories by marketing functions and their transaction governance roles. The first is bargaining –
Negotiating with milk buyers for milk prices and terms of trade; a few may operate milk handling facilities but not milk plants. The second is Niche Marketing – Own or retain plant capacity to process members’ milk into specialty niche products. The third is Fluid Processing – Own or retain plant capacity to process members’ milk into fluid products. They may also process soft and cultured products. The fourth is Diversified – Perform bargaining and all or most other marketing functions.

Naidu (2013) talking about the role of dairy industry in employment says that the progress in milk production can be visualized in terms of monthly income generated through dairying before and after joining the cooperative society will give a clear picture about the economic impact of dairying on the two categories of farmers who have earned the income in terms of cash and manure in kind. The families were increasingly aware of the importance of high yielding cows and buffalos in their livestock for producing more milk. The income of marginal farmers increased through dairying by 57.36 percent i.e comparing the income before and after joining milk cooperative society. Similarly for the small farmers the increase was 44.79 percent. The increase in total income of marginal and small farmers for the same period was 42.72 and 38.09 percent respectively. The increase in total income is less when compared with the increase in dairy income of the farmers. It reveals that the farmers are not getting the expected income from sources other than dairying. It was also observed that the positive approach regarding the profitability, gainfulness in dairy farming is spreading among the villages. The milk producers have also realized the importance of holding the hybrid cow and high yielding buffaloes for more milk and dairy business. There is an urgent need of credit supply at lower interest rates to promote the dairy farming. Separate financial corporation and the
banking system are required to be developed to finance the various dairy activities based on the performance analysis of dairy activities. Advanced scientific dairy farming requires the proper update and timely guidance with active cooperative society experts in dairy farming and veterinary doctors. The provision of veterinary doctor to each village is highly essential. Such doctor cum development officer may shoulder responsibility for promoting the dairy industry in the village. This will definitely help in expanding and promoting dairy business in the country. Dairying is an appropriate and beneficial occupation to increase the purchasing power of rural farmers, which will increase longevity and healthy life in rural areas.

2.3.2. Literature Survey – Milk Quality

Rashid (1988), talks about a very important point regarding milk quality. In order to separate out the effects of consumer tastes and knowledge from those of industrial structure, it is necessary to find a commodity whose quality is readily ascertainable by consumers and where some “objective” determination of the most desirable quality can be arrived at. Milk is an excellent commodity for such a purpose. Most consumers are familiar with it and the quality, in terms of fat content, is readily ascertainable by taste. It is curious that many countries have difficulty in readily providing pure milk. In the Baltimore of the 1920s, when milk distribution was locally organized, pure milk was something of a rarity. The connection between multiplicity of small producers and quality can be noted. In Bangladesh, pure milk is hard to find. Several hundred peasants supply milk to Dhaka from surrounding villages. The only fixed capital, cows, is readily salable in an active market. So both entry and exit are easy. And adulteration is wide spread. The milk industry of countries like Denmark achieved a quality product in the nineteenth
century for two reasons: first export requirements made it desirable and second, the dairy industry was organized in cooperatives who also took charge of milk processing plants. The study provided evidence to suggest that quality has a definite tendency to deteriorate in markets with many small producers and easy entry. In the long run the only way to stay in business is by pleasing customers. This requires providing them with the goods they really want and this long-term dependence of producers upon consumers is perhaps the most effective guarantee of quality.

Ghatnekars (2000) in an article Quality Management – The need of the hour for dairy industry have mentioned that in the quest for higher quality and more profitability, the dairy business is passing through revolutionary upgradation and that the need for such upgradation has been well realized. Since the dairy industry in India plays an important role in the national economy and also because it is likely to have a major share in exports, it is imperative for the dairy industry to adopt various quality standards.

Giangiacomo (2000) has observed that the main factor determining milk composition is the breed of the lactating animals, but also the environment and pastures play an important role. For example in Italy which is a country with a large variety of geographical environments, milk composition can vary significantly with the season and with the location. Farmers do not carry out direct measurement on the composition of milk. However, they are able to evaluate the sanitary conditions of the animals and should be able to detect the presence of mastitis, the major enemy on the dairy farm. Mastitis results in a reduction in fat and protein and the farmer can see and feel a variation of the density of secreted milk. The infection often comes with some secretion of blood, which results in the color becoming pale pink. The farmer is the key quality
controller on the farm. This will include screening of milk containing residual drugs, for example antibiotics or sulphonamides, careful rinsing of the milk tanks to avoid the presence of residual detergents. These residuals and additions can easily be detected and reduce the economic value of the milk. At each delivery the freezing point of milk is also measured for detection of added water. An accurate measure of the degree of acidification is done by the titration of milk. Determination of protein and fat content require more sophisticated instrumentation and trained staff.

Randolph (2004) observes that taste is the most distinguishing characteristic of milk. It is very delicate with a slightly sweet (from the milk sugar, lactose) and aromatic (from the milk fat) taste. Food scientists have been unsuccessful in their efforts to duplicate this delicate flavor. The delicate flavor is subject to the development of many “off-flavors” during production, processing and distribution the challenge is that dairy processors have to protect the flavor from cow to consumer. Unfortunately, food scientists have not been able to develop a scientific test for evaluating flavor or detecting “off-flavors” in milk. Thus the industry must rely on sensory or taste testing i.e. the Ultimate Consumer Quality Test. The delicate flavor/ good taste that consumers expect start with raw milk and must be protected during processing and distribution. If raw milk as on “off-flavor” the finished product will have an off-flavor. Flavor defects cannot be removed, diluted out or covered up by processing. The feed is related to what the cows eat or smell two to four hours prior to milking. If it is mild and leaves a clean after taste, it is a normal flavor for milk and is not objectionable to consumers. Intense flavors caused by eating or smelling green chop, or being on pastures with weeds and certain green grasses two to four hours prior to milking will be objectionable. While dairy
processors perform many tests to ensure the quality and safety, the consumer performs only one Quality Test – Taste. Consumer expects milk to have a clean, fresh and delicate taste – even if the product is purchased on the “sell by” date. The dairy industry must become skilled in performing critical sensory taste tests to ensure that the products do not flunk the Ultimate Consumer Quality Test – TASTE.


Balagtas, et al (2007) found from his study that marketing orders significantly encouraged the growth in the Grade A share of milk. The share of raw milk meeting fluid quality standards in the United States rose steadily through the later half twentieth century, but a shrinking portion of that was used in fluid products. Milk marketing orders are central to dairy market regulation in the United States. The marketing orders have significantly influenced the economic performance of milk markets. Price discrimination by marketing orders raises the relative price of milk used in beverages (fluid milk) reducing consumption of fluid milk and decreasing economic surplus of consumers of fluid milk. Revenue pooling by marketing orders, together with discriminatory pricing, raises the average producer price of milk, inducing increased milk production and increasing producer surplus. By reducing milk consumption and increasing milk production, revenue pooling also effectively subsidizes production of milk for manufacturing uses, resulting in a lower price for such milk and for consumers of
products like cheese, butter and milk powder. Rapid technological change potentially reduces the market value of existing farm capital. Thus, the time horizon of the farm owner or manager also may influence the milk grade choice. Farmers closer to retirement age and without familial heirs to the farm, have less time over which to recover any investment costs and thus perceive a small expected net present value of a switch to Grade A.

Kopecky (2008) in his article in Quality Digest details ten steps to creating a culture of quality. These are very much applicable to the food industry as well as the milk dairies. The nine steps detailed by him are as follows:

1. Guarantee that processes are controlled across the entire supply chain.
2. Create a risk-based system for gauging and ranking suppliers.
3. Realize that quality problems always exist.
4. Implement proper escalation procedures.
5. Determine the root causes of issues in the supply chain.
6. Apply effectiveness checks in a closed – loop system.
7. Ensure companywide corrective and preventive action policies.
8. Institute a proper process for customer complaint and inquiry management.
9. Adopt the philosophy of Six Sigma with its proven record for continuous improvement and its ability to improve processes by removing defects.

Dairy Foods (2008) describes the equipments for testing of dairy products. MADCAP (Milk Analysis, Data Capture and Processing) is an industry based software system. It is highly configurable and scalable and offers the agility required by the modern dairy industry. MADCAP offers a multiple-module solution that offers
everything from the collection and procurement of milk, testing and quality management through to payment to members for milk supplied, as well as share equity systems. MADCAP manages the delivery of information to the farmers/members via a standard internet site. MADCAP’s information is available to third party report writers and third party development as needed. Tetra Pak has launched Tetra Lactenso Aseptic, a new generation of customized aseptic production solutions that enables dairy producers to achieve superior and consistent product quality while reducing operating costs by up to 20 per cent and minimizing their environmental impact. Tetra Lactenso Aseptic establishes a new approach to working with dairy customers in which Tetra Pak custom designs an end-to-end production solution for each customer based on their particular performance needs. Whether the requirements are about product quality, flexibility, productivity, sustainability or a combination of these, Tetra Lactenso Aseptic can fulfill the customers’ demands. Tetra Pak maintains the capability to deliver the best production solution for ambient milk production solutions that makes a difference to their customers.

Hockmann et al (2008) has constructed a model to identify the determinants of the diffusion rate of quality standards in a food chain. They argued that adoption decisions in the food chain are determined by farmers’ and processors’ economic considerations. Factors such as pricing behavior, compliance costs and market structure are identified and discussed in the research paper. The findings are used to test an econometric model utilizing data on Polish milk processing firms gathered between 2000 and 2002. The results indicate that input and output prices have a significant influence on the diffusion rate of standards; the dominance of large – scale holdings in the relevant procurement market significantly increases diffusions as well. Compared to their competitors, small
cooperatives were found to face more significant problems in procuring high quality raw materials.


Business Line (2013) carried a news item that the leading New Zealand dairy company Fonterra has resumed operations in Sri Lanka after temporarily closing its plant out of concern for the safety of its staff. Operations in Colombo were temporarily halted to ensure the safety of about 755 employees after a protest near their office, accusing them of selling tainted milk. Fonterra had to suspend the sales and advertising of its products after Sri Lanka’s Health Ministry said that tests showed that some imported Fonterra milk products contained traces of the agricultural chemical dicyandiamide. The company later retested the product and found it free of the bacteria.

2.3.3. Literature Survey – Logistics, Supply Chain and Marketing

Cooper (2002) observes that twenty five years ago the milk from a cow would arrive at the consumer’s door step between four hours to twelve hours after milking time. Today this interval is much longer. The entrepreneur plays a much larger part in the dairy business than earlier. The dairy industry has seen technological advances and the transition from the horse and wagon to the paneled milk truck. There are service departments in the dairy industry whose activities are integrated with those of the main operating departments. These are power, selling, auto and truck, credit and collection and general administrative expenses. It has been mentioned that selling is a part of milk
distribution. The distribution through refrigerated vehicles has become an important part of milk distribution.

Kulkarni (2004) in a case study on AMUL – Gujarat Cooperative Milk Marketing Federation published in a book on Supply Chain Management talks more on the supply chain aspects. In this case study, they have also covered the concepts such as Kaizen, Hoshin Kanri, Small Group Activities etc. Automatic Quality checks at all levels right from collection from the farmers to the manufacturing of the finished product ensures that quality remains standard at all the stages through which the product moves.

Nataraj B.S (2005) in his paper titled Marketing of Milk and Milk Products Opportunities for Entrepreneurs talks about India being not only the largest milk producer but also one of the most economical producers in the world. According to his statistics, the cost of 100 litres of milk production in 2005 in India is 20.54 USD against 21.10 USD in New Zealand, 41.00 USD in United States and 52.00 USD in Canada. However, in the world trade of dairy products, India accounts for hardly 1% of the share compared to the share of New Zealand at 24% of the world trade in dairy products.

Anjani Kumar (2010) addressed the issues associated with the alternative milk market chains and their implications on dairy farmers and traders. The study found that in spite of their growing presence of modern milk supply chains, the traditional milk supply chains is still dominant. Traditional milk processing offers good opportunities for the small and resource-poor milk producers and traders to enhance their income. The policies should be evolved in the traditional milk sector to allow informal players to improve their performance including quality control and their integration with the emerging modern
milk supply chains. A Logit model was developed to identify the factors that influence decision of milk traders to participate in the value addition activities of milk. The study also found that in India, milk production is dominated by small producers having only a few buffaloes or cattle, in systems closely integrated with crop production through use of crop residues such as rice and wheat straw. The marginal and small land holders account for about 69% of the total milk production in the country. On an average, 72 percent of the farmers market their milk through the traditional milk supply chains and 60% of the marketed milk was purchased by the milk market agents. The proportion of marketed milk sold through the traditional milk supply chain varied from 48 percent to 71 percent across different categories. The profit from milk production was found to be considerably higher in case of farmers linked with modern milk supply chain compared to those farmers selling milk through traditional milk supply chains.

Wani et al (2010) examined the prevailing marketing system, utilization, marketed surplus / consumption, channels of distribution, processing / demand and supply scenario of milk in Jammu and Kashmir. Marketed surplus as percentage of total production varies from 68 per cent in intermediate zone to 73 per cent in sub tropical zone. Milk producers are ill-organized and suffered from severe handicaps in marketing of their milk profitably. The milk marketing is still primitive, basically due to the product characteristics and consumer necessities. The sale of milk through different channels and price paid by agencies was studied in the various zones. The figures indicate that the percentage of household selling milk was highest in the valley temperate zone (80%) , followed by subtropical (69%), intermediate (38%) and lowest in cold arid zone (29%). The obvious reason for this variation could be the marketable surplus of households. In
terms of price efficiency, it was observed that the price paid by consumers / dairy cooperative societies was highly efficient followed by milk shops and vendors. Productivity and production, consumption and marketed surplus of milk have been found encouraging and higher than the national average. The analysis has revealed that dairying offers a vast potential for development in the state. Integration of dairying with processing / value addition has ample scope in the state and can help to boost milk production, increase income and employment to producers and urban consumers with regular supply of quality milk and its products at reasonable prices. Besides, encouragement of the private processing sector , government should replicate Anand model in the cooperative dairy enterprise in the virgin areas of the state to tap marketed surplus in scattered milk – shed.

Rao et al (2013) talks about the various supply chain issues being faced by the dairy industry in India. The dairies are facing high input costs for milk production mainly due to lack of proper infrastructure for handling, transportation and storage. The dairy supply chain involves the diverse range of distinct enterprises such as milk producers, village societies, feed and fodder suppliers, veterinary drug suppliers, collection centres, dairy plants, storage and transport facilitators, marketers, exporters, importers, distributors, wholesalers, retailers and consumers. The input sources are also from diverse geographical locations. Starting from milk collection through milk production to milk distribution till it is delivered to the end consumers, the activities need to be viewed as important links in the milk supply chain. Delivery of milk and milk products to quality conscious customers can be achieved by integrating the activities of various dairy farmers, suppliers and other stakeholders of dairy industry and effectively managing the
entire supply chain. Such a supply chain ensures safe and wholesome milk delivery in a cost effective manner. Understanding the critical issues in the dairy supply chain, including prospects for value addition and measures to address the same, would make dairy business a sustainable venture.

2.3.4. Literature Survey – Customer Requirements

Sreekumar P (2007) has gone into detail on Customer Experience Management (CEM). Customer Attitude and Customer Perceived Value can be improved by managing customer interactions under the perspectives of CEM. Understanding the various experience points especially under the complex environment of many outsourced functions, and managing them with the use of relevant IT tools can ensure less customer attrition and long term profitability. The focus should shift from Operations and Service based CRM to total CEM by analyzing the multipoint customer interactions and understanding that customer satisfaction needs a holistic approach covering all possible contact points through which the customer experience is delivered. Customer Experience is as important in milk and milk products as it is for any other product or industry sector.

Godfrey Vivien (2010) talks from the consumer’s viewpoint. If perception is reality, then from a consumer’s perspective milk is different than it was even a few years ago. The changing times have changed milk. And milk has “changed” for the better, in part due to the Milk Mustache “got milk?” campaign; in part due to the work of individual milk processors and producers, and in part because milk is an exceptional product that is truly more relevant today than ever. People are looking for foods that are naturally wholesome and nutrient rich. Nothing tops milk in that regard. As for the
economy, tough times are causing more consumers to prepare food at home, and this trend seems to be driving milk consumption up. MilkPEP – Milk Processor Education Program job is to leverage these myriad ways that milk is relevant to moms, teens and families today. Milk draws in great collaborators from outside the dairy industry as well. MilkPEP is increasing partnerships with some of America’s leading food brands to encourage consumers to enjoy more milk. But MilkPEP’s most important partnership is with individual milk companies. There are excellent opportunities to build synergies between the local efforts of milk companies and the national program.

Choubey (2010) made an analysis of consumers’ preferences and trends in consumption of milk and dairy products and their impact on determining dairy production and marketing opportunities in Assam. The study reveals that the rural consumers are older and less educated, and on an average, have larger household size than urban consumers. Almost all consumers are non-vegetarians and the majority of their household members are lactose tolerant. Urban and rural consumers have shown differential preferences for certain quality attributes of milk and dairy products and this finding does not support the hypothesis of the same preferences by these two types of consumers. The percentage change in the per capita monthly consumption of dairy products in Assam between 1993-94 and 1999-2000. Milk consumption in urban areas increased by about 29 per cent while that in rural areas decreased by about 8 per cent. Consumers consume different types of dairy products but the degree of preference for a particular product for a specific use may vary significantly between consumers. The attributes in milk that are preferred by both urban and rural consumers are high fat content, yellowish color, thick consistency and good smell/flavor. Understanding the preference is the key to production
and market development, as the nature of the consumer demand both in terms of quantity and product attributes guide what needs to be produced and marketed.

Carper (2011) talks about the milk category getting frothy as processors try hard to differentiate their products. Faced with stagnant growth and competition from non-dairy beverages, processors try to boost sales with flavored milk, new retail channels and new processors. The milk processors also use processing techniques and packaging to make their beverages stand out in the dairy case. Savvy marketers are placing their products in alternative channels such as health clubs, home improvement stores and outdoor equipment retailers. The research suggests that about a third of conventional milk purchasers are looking for something new and different in their milk choices.

Carper (2012) has raised a few questions – How is the dairy industry like Blockbuster, the video rental chain? What can dairy processors learn from Gillette? Will the food industry be up to the task of feeding billions more people in the years to come? What did Confucius have to say about intellectual property rights? Blockbuster used to own the in – home entertainment business which was rendered impotent by new competition, including Netflix, cables on-demand movies, streaming video on the internet, bootleg copies and other rivals. Milk today faces its fair share of rivals, including juices coffees, soft drinks, teas, sports drinks and energy shots. Milk continues to fight off those beverages. Processors need to innovate by fitting the product to the lifestyle. Babies, toddlers, teens and young adults all have nutritional needs that milk products can satisfy. Processors need innovative formulas and delivery systems. Gillette showed how to create value in razor blades. There is a noticeable difference between a Mach 4 blade and a disposable razor, and men gladly pay the premium. Milk processors need to develop
premium beverages that retailers won’t devalue as loss leaders. The importance of
distribution should not be diminished irrespective of whether the product is movie or
milk. Milk has to be made available where the drinkers are. That means expanding
beyond the traditional channels.

Deepa (2012) talks about the three main requirements of customers as the three
‘A’ s of Marketing – Availability, Acceptability and Affordability. Indian dairying is
already endowed with the first two. People in India like to drink milk. Hence no efforts
are needed to make it acceptable. Its availability is not a limitation either, because of the
ample scope for increasing milk production given the prevailing low yield from dairy
cattle. It leaves the third vital marketing factor – Affordability. Dairies in Kolhapur are
mainly involved in processing and packaging of the buffalo milk and producing the milk
products. They are marketing these products in the local areas or within Maharashtra.
Previously there were only few dairy units in Kolhapur and so the competition was less.
Many new entrants have entered the industry because of the good business. Kolhapur is
surrounded by many small villages and the major occupation of the people is farming.
These farmers have the cattle along with the farms which increases the total
attractiveness of this industry. Some companies are manufacturing carton milk which last
for a longer period and they are facing the competition from them. These dairy industries
are mainly focusing on marketing of milk and not on the milk products. Some steps
suggested are reducing the transportation cost of milk from the collection centers to the
dairy plant. Also to utilize all the by- product instead of throwing them away. Items like
ghee residue, cheese whey, butter milk etc can be utilized successfully with the available
technologies. Another suggestion is to go for big capacities of specialized plants to make
it more cost effective. With these measures the price can be made affordable and at the same time be profitable for the dairies. The sales force of the dairies is used to persuade the distributors and retailers to push the sales of specific dairy unit. They adopt timely delivery and marketing assistance to the distributors and retailers to promote the sales. To face the increased competition, they are required to enter the new markets. They can adopt penetration strategy to increase the market coverage. There is a need to use different distribution channels for different markets as per the market characteristics.

Smith (2013) talks about consumer demographics. A shift in consumer demographics is one of the major changes posing a challenge – and an opportunity – for the U.S dairy industry. By 2020, 60 per cent of the U.S. population will have chronic health conditions. 33 per cent will be over age 55, 20 per cent will be Hispanic, and the number of single households and male grocery shoppers will rise. As a result, consumers, food and beverage chargers will change. As people age, their commitment to health increases. As people are exposed to foods from other cultures, their tests alter. As households downsize, people prefer single – serve and easy – prep products. To meet consumers’ complex and constantly changing needs, the Innovation Center for U.S. Dairy, Rosemont, predicts it will be necessary to employ more multifaceted segmentation, micro-targeting and addressing of personalized needs in its product formulation, benefit package and messaging offerings, according to its “The Future of Dairy” report. To be engaging in the new era, a dairy product must multitask. The majority of Gen Y is open to getting nutrients through fortified foods-with a caveat. Over 50 per cent of Gen Y believes fortified foods can help meet daily nutrients recommendation and they look for these products in stores. However, 50 per cent also
say they need more clinical proof regarding the bioavailability of added nutrients, according to (2011) “Health and Wellness Trends Study” by the Natural Marketing Institute.

Kennedy (2013) observes that as sales of non dairy milks alternatives surge, the milk industry fights back with innovations in single – serve packaging and by positioning chocolate milk as a recovery beverage. In the 52 weeks ended Nov.4, 2012, sales were stagnant and unit sales were down 2.3 per cent according to data from Symphony IRI Group, Chicago. As the milk industry continues to scramble to find ways to stay relevant, alternative nondairy milk forms, like almond milk, show an increase in popularity. But milk processors are not going down without a fight fueled by the on-the-go trend and a rise in popularity of chocolate milk as a recovery beverage, there is still promising news for the industry. Single – serve milk offering continue to grow as processors look to add more portable milk solutions. Recent studies from Chicago based mintel show that households with children are more likely to be interested in single-serve milk packaging. Though its studies also show that many milk drinkers prefer a refrigerated format, milk processors can increase milk drinking occasions by communicating the benefits and multi-occasion use of aseptic packaging for children – such as in school lunch boxes and on the playground. Creative marketing has helped processors and packaging also plays an important role. Ultimately the turnaround will come from a combination of economic relief and marketing. Processors will have to continue to innovate and bring new products to market, with focused marketing spending to keep milk’s very relevant benefits top-of-mind.
2.4. Major Gaps in Existing Research

On the basis of the above review of literature, following research gaps may be identified.

1. It is observed that there is no detailed and exhaustive study on Quality Management in Milk Dairy covering all stages i.e. from Cow to Consumer.

2. The studies conducted have not covered the processes in detail starting from raw milk to the packed milk supplied to the customers.

3. The existing studies have not included the Cold Chain and other aspects of Milk Supply Chain in detail.

4. The studies conducted have not covered the customer satisfaction aspect of Nandini Milk Consumers in semi-urban and rural Karnataka.

2.5. Summing up

The review of theoretical framework on marketing mix has brought out the relationship between overall satisfaction and the various Ps of marketing. The quality management systems and their benefits have also been highlighted. Since the supply chain aspects are very important in dairy industry, a brief introduction is given regarding the milk supply chain. The literature review on cooperatives has brought out the importance of the contribution of milk cooperatives to the economy of the countries traced in both global scenario as well as the national scenario. The literature survey on milk quality has detailed about the quality dimensions and quality initiatives undertaken by the various dairies around the world. The literature survey on logistics and supply chain has brought about the importance of cold chain and other aspects of transportation of milk. The customer requirements have also been covered as part of the literature survey.