CHAPTER III

REVIEW OF RELATED LITERATURE

3.1 INTRODUCTION

The Indian economic basket consists of different kinds of consumers who consume a variety of food items based on their social, religious and economic factors. The Liberalisation of the Indian economy and its resulting effect on consumer habits has led to a different lifestyle among the consumers. Increased urbanization and improved standard of living have paved way to a new era. The importance of milk and milk products in human diet need not be over-emphasized in a country like India where milk is the main source of animal protein for the predominantly vegetarian population. Several studies have been conducted by the researchers on consumption of milk and milk products in India as well as abroad. They have found that the demand for dairy products is influenced by the availability of milk, income, awareness about nutritive value of dairy products and food habits of the people. In the following paragraphs the results of the earlier studies are summarized. A discussion of foreign studies precedes – Indian studies.

3.2 RESEARCH ABROAD

Nittala Ratham and Heinz Spielmann (1972), in their study entitled 'Consumer Attitudes and their impact on fluid milk demand in Hawaii – A component – Regression Analysis Approach', aimed at studying the consumption pattern of milk and milk products and to ascertaining the factors responsible for variation in the consumption pattern. A random sample of 250 households was chosen from telephone directory and a questionnaire was designed to collect the data. Component Factor analysis has been used to analyse consumer attitudes towards three important fluid milk products, fresh milk, skim milk and filled milk, in the Honolulu metropolitan area. The quantities of total fluid milk consumed per week by the sample households were regressed individually against the socio-economic variables and the 13 attitudinal factor scores were applied to study the impact of socio-economic variables and attitudinal factors on the consumption of individual fluid milk products. Stepwise Regression has been used for selecting important variables. The study gives certain practical conclusions on the demand for milk products, the consumer's attitudes and the expectations of the dairy industry. The study has
developed the pattern of milk demand among the important ethnic segments of consumers. The study concluded that the oriental ethnic groups give importance to nutritional and health considerations whereas economic and price factors were given importance by other ethnic segments.

Chung, Huang and Robert Raunikar (1983), in their study entitled 'Household fluid milk expenditure pattern in the South and United States' were aiming at examining and comparing household expenditure patterns for whole milk and low fat milk in the Southern region of U.S. as well as in the total U.S. Specifically, the study focused on identifying and analyzing the effects of household income and other socio-economic characteristics on whole milk and low fat milk expenditure patterns in the South and in the total U.S. The Ordinary Least Squares (OLS) procedure has been used. The analysis was based on the application of the Tobit maximum likelihood procedure. The study suggested that, the household size and household income affected the forms of fluid milk expenditures quite differently. The study results indicated that, while the effects of increased income results in using low fat milk in the whole of U.S. by the people. It decreases in whole milk expenditures in the South, fluid milk expenditure may be expected to increase as the household income in the region increases.

Termorshwizen, Meulenbery and Wierenga, (1986), carried out a study entitled 'Consumer behaviour in respect of milk in Netherlands" in which they used Engel, Kollat and Blackwell (E.K.B) model – an integrated model of consumer behaviour. It was established that irrespective of socio-economic variables explaining individual difference in consumer beliefs regarding milk are age, level of education and residential area, liquid milk was perceived as a neutral drink, as a food not a drink for pleasure and refreshing.

Burmann, (1987), conducted a study entitled 'Consumer Attitudes and Behaviours with regard to liquid milk in the German Federal Republic'. The results of the study disclosed that households consume milk very frequently. Further it was found that an equal percentage of the consumers were using pasteurized milk and Ultra-Heat Treated (UHT) milk. Milk was used comparatively more for drinking. The pasteurized milk was considered to be fresh and tasty whereas UHT milk was felt as convenient.
Suzanne, Elbon, Mary Ann, John and Joan Fischer (1998), conducted a study on 'Milk consumption in older Americans'. The purpose of the study was to identify individual characteristics associated with types and frequency of milk consumption in older American adults. A national probability based sample completed a telephone survey with a response rate of 91%. Generalised Logit and Cumulative Logit analyses were used to identify predictors of and barriers to fluid milk consumption among 494 elderly people. It was found that the likelihood of drinking skim milk rather than whole milk increased with nutrition knowledge, trying to reduce cholesterol intake. Frequency of milk consumption was also found to be higher among female and adolescents with nutrition knowledge.

Jane Lu Hsu and Gary Shang – Min Liu (2000), carried out a study on 'Consumer perceptions of fluid milk advertising in Taiwan'. The two objectives of the study were to classify consumers based on their responses to fluid milk advertising and associated demographic factors and to measure the increased amount of expenditure that consumers spend on fluid milk products after perceiving advertising. The study analysed consumer perceptions of fluid milk advertising in Taiwan using cross-sectional data. The Clustering method was utilized to segment the fluid milk market according to the respondents' perception levels of fluid milk advertising and demographic characteristics. Data were collected through in-person surveys conducted in supermarkets in the selected metropolitan areas in Taiwan. Results indicated that advertisements of fresh milk and yoghurt drinks were more effective in increasing market sales than advertisements of flavoured milk. Consumers in the cluster of 'high perception' were more likely to be females between the ages of 26 and 35, people with higher annual household income and people living in smaller households. The cluster of 'low perception' of fluid milk advertising consisted of more males of old age, people having lower annual household income and people living in larger households. It was also found that consumers who were more sensitive to fluid milk advertising, after perceiving advertisements drank more fluid milk in summer and had strong brand preferences.

Mohamed Safiullah, Prabhaharan, Selvam and Prabhu (2001), conducted a study on 'Determinants of milk production and consumption in Hungary'. The study was based on the time-series data at national level for the period from 1960-1992 with regard
to production and consumption of milk in Hungary. To examine the determinants influencing the production and consumption of milk, Log-Log function more popularly known as Cobb-Douglas function and Multiple Linear models were chosen as statistical techniques. The results obtained from the study show that milk production was influenced by productivity of cow, procurement price index, maize and sugarbeet production etc., indicating a further scope for increasing the national milk output through improved breeding, feeding and appropriate procurement price policy. Milk consumption was found to be highly determined by the real income level and was adversely influenced by the competitive food items like fish and meat.

Sulu and Kaojuisheng (2001), made a study to analyse 'Factors affecting consumers' fluid milk purchasing pattern in Taiwan. The study was carried out with an aim to know the product comparisons and market implications to evaluate product attributes, advertising and demographic factors that influence purchasing patterns of fresh milk, flavoured milk and yoghurt drinks in Taiwan. Data for this study were collected through random in-person surveys with 110 respondents in various supermarkets. The results of the study indicated that freshness was the most important product attribute when consumers purchased fluid milk products. Product prices and brands affected purchasing quantities of flavoured milk products but they had no effect on fresh milk and yoghurt drinks. Advertising was found to have positive effects on the purchase of flavoured milk and yoghurt drinks. Household shoppers with higher educational levels purchased less flavoured milk products. Larger households purchased more fluid milk products, especially flavoured milk.

Barreiro Fernandez, Losadaperez and Ruzo San Martin (2002), carried out a study in Spain entitled 'Brand equity, perceived quality and objective quality- a comparative analysis of the milk market', They tried to confirm the correlation between the value given by the consumers to the different brands and the perception of consumers on the quality of milk. A Multi Nominal Logit model has been used to measure the brand equity assigned by the market, whereas the objective quality levels have been assessed by means of a Sensory analysis based on Hedonic Testing carried out on consumers and
analytical testing carried out by experts. The results of the study identified that a positive correlation between the brand equity assigned by the market and the quality perceived by the consumer exists only for full-cream and semi-skimmed milk.

Burrell (2002), in his article entitled 'Consumers' reactions to Artificial Bovine Somatotropin (r BST) milk with and without labelling', made an attempt to determine how Dutch consumers might react if milk labelled as produced by cows treated with r BST becomes available alongside milk from untreated cows and how consumers might react if r BST is authorized but without any labelling scheme to differentiate between the milk of treated and untreated cows. For this purpose 99 respondents, consisting mainly of students, academics and non-academic personnel from Wageningen University, Netherlands, were surveyed. Results expressed that the potential buyers of r BST milk considered the two types of milk as substitute products. However they treated r BST milk as inferior, as good as it needed a price advantage to gain any marked share. It was found that fears about the safety of r BST milk were far more important than concerns about animal welfare in determining consumers' preference between the two types of milk. The results of the study concluded that 90% of the respondents were in favour of labeling and over 40% were unwilling to buy milk from r BST-treated cows.

Roy, Huque, Islam, Hasanuzzaman and Rahman (2003), in their study entitled 'Consumption pattern of milk and milk products among different income levels in some selected areas of Bangladesh', examined three different areas of Bangladesh. In this study, family budget data were collected through household survey for 179 selected households from the three selected areas of Bangladesh, comprising 44 from Rural, 61 from Municipality town and 74 from Metropolitan city households which formed the basis. The sample households were post classified into five income groups based on monthly household income. Among milk and milk products, the major allocation of expenditure was devoted to liquid milk followed by sweet meats and powder milk and 'other milk products'. It was found that the households residing at municipal areas consume more milk, sweet meats and dahi than the consumers in Rural and Metropolitan city. On the other hand, Metropolitan households consume more powder milk, condensed milk, ghee and ice-cream. The consumption of milk and some milk products and expenditure on it increased substantially, with the increase of income in all the areas.
Manellya and Tregubov (2003), in their article entitled 'Production and consumption of milk and dairy products in the Russian Federation', have presented a review of the state of the industry. Changes in livestock numbers, productivity of livestock, production of milk and dairy products, provision of feed stuffs, the state of the dairy market were analysed. It was stated that the consumption of dairy products in Russia in 2001 as compared to 2000 was 221 and 216 kg per person per year, respectively. It was suggested that technical modernization of the industry is needed in order to keep up with the demand.

Olival and Spexoto, et al. (2003), have conducted a study in Brazil on 'Consumption habits of milk without sanitary inspection, associated with the risk of transmission of diseases in the municipality of Pirassununga'. An increase in the production of milk without any sanitary inspection has been observed. The objective was to characterize habits associated with the consumption of milk without sanitary inspection in Pirassununga city. The most consumed product from this type of milk was cheese. The cheese was bought in supermarkets, mini-markets or directly from farms or peddlers. It was consumed by 15% of the population, who bought it mostly from peddlers in plastic bottles. It was found that there was no relationship between family income and milk consumption.

Wham and Worsley (2003), conducted a study on 'New Zealanders' attitudes to milk implications for public health'. The study aimed at identifying consumer attitudes and beliefs about liquid milk that may be barriers to consumption. Two random-quota telephone surveys were conducted in Auckland. Respondents were questioned about their usual milk intake and their attitude to milk. The questionnaires included attitude items that reflected the main themes of consumer interest towards milk. 713 respondents in the base line survey and a separate sample of 719 respondents in the follow-up survey were considered. The results reveal at least one-third of the respondents consumed less than 250 ml of milk a day. Non-consumption was highest in young women. Women held more positive attitudes but they were concerned about the fat content of milk. Men were less aware of milk's nutritional benefits and as a result were less appreciative of its value. It was concluded that industry-health alliances may be an effective means to provide positive nutrition messages about milk and to engage the support of health professionals.
Tzimitra-Kalogianni, Kamenidou, Priporas and Tziakas (2003), carried out a study entitled 'Private label milk and Greek Consumers' behaviour', conducted a consumer survey with 262 respondents in greater Thessalonica in order to examine Greek consumers' behaviour and attitudes towards private label concentrated milk. It was found that majority of them purchase private label evaporated milk and the consumers who do not purchase the product perceive it as inferior in quality. It was also found that price has been considered as the main reason for consumers who continue to purchase private label evaporated milk, followed by quality and credibility of the supermarket. It was concluded that in general attitudes toward private label evaporated milk were indifferent and not negative.

Selim Adem, Hatinil, Burhan Ozkan and Ali Riza Aktas (2004), in their study entitled 'Factors affecting fluid milk purchasing sources in Turkey', investigated main factors affecting fluid milk purchasing sources of households in Turkey. From the collected household survey data, a Multinomial Logit model was estimated to analyse households' choices among unpacked, processed and processed-unpacked fluid milk alternatives within the utility maximization framework. The results indicated that the number of children, household size, educational level and income were among the important household characteristics that influence fluid milk purchasing behaviours. In particular, processed fluid milk purchases were made by households with high-income levels, higher educated and small households in comparison to unpacked fluid milk purchases. On the other hand, results revealed that response of households to price difference and other usages of fluid milk significantly stimulate households to choose unpacked and processed unpacked alternatives over the processed fluid milk choice.

Kalyan Chakraborty (2005), has conducted a study entitled 'Consumer's attitude towards hormone free milk: what have we learned?' The major objective of his study was to examine if the consumers' attitude and perception towards bovine Somatotropin (bST) – produced milk have changed over the past decade since its commercial use began in 1994 in USA and to measure consumers' willingness to pay for bST-free milk. To obtain information a systematic stratified sample of 5000 households was drawn from the entire state population. Questionnaires were used for the purpose. A discrete choice Probit model was applied for willingness to pay. It was found that after nine years of use,
consumers' negative attitude and perception about bST-treated milk have not reduced significantly in USA. The study found that, with the adoption of bST technology even if the potential price reductions were substantial, there would be a considerable decrease in milk demand. It was suggested that the probable solution would be the introduction of mandatory labelling that would minimize the potential market loss.

Alen and Muniza (2005), carried out a study entitled 'Contribution to the knowledge of milk as consumers products'. Three hundred consumers from around Sarajevo in Bosnia – Herzegovina were interviewed about their purchasing habits with regard to milk. The results showed that the majority of the consumers considered price as the determining factor in their purchases. Also most of the interviewed subjects bought milk from domestic sources. The results of the study also revealed that the packaging design did not influence the consumers.

Freitas, Dasmasceno and Calado (2005), conducted a study on 'Labelling of dairy products- perception of the consumer'. The study was conducted in the city of Natal, Brazil, to assess the behaviour and profile of consumers regarding the labelling of dairy products in supermarkets. The results showed that consumers were interested in reading products labels on dairy foods they were buying. A considerable percentage of people from the north, south and east regions of the city, respectively, of the opinion that, the food label information was assuring. It was also found that consumers were in the habit of reading food labels, particularly the expiry date of the product and milk was the most frequently purchased dairy product. In addition, the study identified some dairy products that were not labeled with nutritional information according to the legislation.

Soliven (2005), conducted a study entitled 'Supply and demand analysis for milk and milk products in the Philippines'. The study was aiming at analyzing the supply and demand structure for milk and milk products, more specifically, it aimed at determining the supply elasticities of raw milk and the demand elasticities for six types of processed milk products. Government policies and programmes affecting the production, marketing and consumption of milk were also reviewed. Cross-section data gathered in major dairy areas and major demand centres were used in estimating the demand. Three functional forms were tested in the Multiple Regression analysis, namely: Linear, Semi-Log and the
Double Log using the Ordinary Least Squares (OLS) estimation technique. The study revealed that high demand for quality fresh milk was found among milk consumers. The estimated demand equations for most of the dairy products highlighted the significant effects of price and income on milk consumption. Furthermore, the study also disclosed that educational attainment, household size, awareness of the nutritive value of milk and consumer preferences were also found to explain the consumption behaviour for some milk forms.

Vander Mersch and Mathus (2006), in their paper entitled 'Consumer willingness to pay for domestic milk', investigated the option of using a domestic origin certification to upgrade the value of milk. A consumer survey was conducted with a total of 626 respondents conducted at the three largest supermarket chains in Flanders (Belgium). Of the nine products covered by the survey, it was identified that 51% of the respondents were buying milk. Results also indicated, the evidence for a latent demand for domestic milk. Based on actually purchased brands in combination with preferred attributes, two consumer types were distinguished (price shoppers and added-value seekers), each with a different behaviour concerning domestic milk. Socio-demographic, attitudinal and behavioural variables were found to influence the probability that a consumer is willing to pay a premium for domestic origin certified milk. However, the influence of these variables differed between both consumer types as well as when a different bid level was proposed.

Niazi, Anwer and Hassnain Shah (2006), in their article entitled, 'An analysis of milk production, consumption and growth trends in Pakistan', have described the trends in milk consumption and prices, the future prospects of consumption and milk production. They also suggested policy measures for milk production in Pakistan. Data from 1982 – 2001 were analysed. It was shown that Pakistan ranks third to Ireland and Sweden in the per capita consumption of milk and milk products and about 30% of small farmers produced milk for selling and per capita milk production consistently increased with an average annual growth rate of 5.8%. It was found that milk consumption is highly correlated with the per capita income. It was also found that milk constituted 64% of the total value from the livestock sector.
Huszka and Polereczki (2006), undertook a study on 'Analysis of the consumption frequency of dairy products in Hungary'. The survey was based on a 1000 strong representative questionnaire inquiry. The results showed that more than 70% of the respondents consumed milk and milk products. Milk in plastic bags belonged to the lower price category and was consumed every other day. Consumption of margarine was next to milk in plastic bags. Butter and milk in cartons were thought to be more expensive but of better quality. These were followed by ripened cheese, butter cream, fruit yoghurt and sour cream. Milk powder was consumed at least once a week. It was consumed only for coffee drinking. Ice cream was consumed every other week. The study also found that 37.8% of the consumers did not know that margarine was not a dairy product and they consumed margarine more frequently than butter.

Watanabe and Suzuki (2006), carried out a study entitled 'Is Japan's milk consumption saturated?', with consumer survey data on the consumption of fluid milk, yoghurt drinks, yoghurt and cheese in Japan. The Heckman's Two-Step Estimators of the Type II Tobit model for each of the four products indicated that, the higher evaluation on milk utility and higher health concerns were more important determinants on how much yoghurt and cheese to eat than on how much fluid milk, including yoghurt drinks, to drink. This has been an evidence of the fact that people with good images of milk increase yoghurt and cheese consumption instead of fluid milk, or that fluid milk consumption has been replaced by yoghurt and cheese. The estimation results indicated that few factors can motivate people to increase fluid milk consumption because most factors were insignificant in deciding how much fluid milk to drink. It concluded that, the fluid milk consumption in Japan has reached its saturation.

Czarnocinska, Wadolowska, et al. (2006), in their study entitled 'Analysis of factors influencing the choice of dairy products by Poles popres study', included 9339 people aged from 13 to 75 years, inhabiting six regions in Poland. Thirty choice factors of dairy products were evaluated. It was found that dairy product's choice was more affected by sensory and functional factors than the socio-cultural, economic and health ones. The average importance of all groups of factors influencing dairy products' choice was significantly correlated with sex, age and region of inhabitance. The size of the place
of inhabitance differentiated significantly the average importance of economic and socio-cultural factors. The results obtained showed that Poles underestimated the role of dairy products and they had consumption motions in food choice.

Cliff, Robb, Laura, Reynolds and Mohamed Abdel Ghany (2006), conducted a study on 'Consumer preference among fluid milks: Low-fat vs high-fat milk consumption in the United States'. For the purpose of study, the data have been collected from the continuing survey of food intakes by individuals from the year 1994 to 1998 in order to analyse milk consumption by type, specifically high-fat milk vs low-fat milk. The study by using trend analysis disclosed that an overall increase in low-fat milk consumption was found over the last few decades in the United States. Through the use of Logistic Regression, key socio-economic demographic variables were analysed in order to determine their impacts on the probability of consuming low-fat milk vs high-fat milk. The results indicated that probability of low-fat milk consumption appeared to be positively related to age, education level and income level. The study also found that African Americans and other minorities had a lower probability of consuming low-fat milk when compared with white people in the same population.

Frankfuller, John Beghin and Scott Rozelle (2006), carried out a study entitled 'Consumption of Dairy Products in Urban China'. They conducted survey in 2001-2002 among 214 households belonging to three cities, Beijing, Shanghai and Guangzhoa. The study analysed demographics, cultural factors and purchasing behaviours influencing the consumption of fresh milk, yoghurt, ice-cream and powdered milk in the three cities. Results from estimation of a double-hurdle model of consumption showed that income and marketing channels were the key determinants of milk consumption levels. However, education, advertising and convenience played a more important role in the consumption of other dairy products. The milk powder, as a consumer good was likely to become an inferior product in Urban China. Finally, the survey data suggested that the growing sophistication of China's retail sector also influenced the consumption of dairy products.

Gustavsen and Rickertsen (2008), in their article, 'Consumers cohorts and milk purchases', made an attempt to find out the reason for decline in the purchase of fluid milk in Norway over a period of 1986 to 2006 and why the per capita purchases of fluid
milk were reduced by more than a third. It was found that the aggregate demand for fluid milk is quite inelastic with respect to changes in price of milk, advertising and income. Those elastic values suggested that economic factors alone cannot fully explain the observed decline in fluid milk consumption and reliably forecast future consumption. To provide additional insights 'cohorts of households' was followed where the cohorts are defined by 'the age of the head of the household'. It was found that the positive effect on purchases of increasing age has sometimes attributed to increased health awareness among older people. It was found that reduction has partly been offset by increased consumption of cheeses and some other dairy products. The replacement of generations will continue and further decreases in milk purchases are likely. They conclude by saying that decreasing milk purchases are likely to reinforce the problems of agriculture and many rural communities.

**Karinaram (2010),** has conducted a study entitled ‘What are the important features of Italian milk market?’ The study aimed at finding out the reasons behind the decline of Italian milk market. It was found that the milk market declined due to socio-cultural characteristics of Italian market such as lower birth rate, less consumption of dairy products by aging population, declining homes with children under the age of 15 and rapid growth in substitute to milk products.

**3.3 RESEARCH IN INDIA**

**Patel and Prabhaharan (1980),** in their study entitled 'Consumer Awareness and Preference for milk in Madras city’, have analysed the consumer preference towards cow milk and buffalo milk. They also analysed the preference for fat content in standardized and toned milk and also examined the size of package of milk that the consumers preferred. The study was confined to the dairy plants under the control of TN Dairy Development Corporation (TNDDC) which covered 17 zones. A complete link of households in each zone then buying milk from TNDDC was obtained from secondary sources. From among these, a predetermined sample of 300 households was randomly selected based on the probability proportional to the number of consumers in each zone. The data were collected by conventional field survey from the respondents with the help of a structured questionnaire. The study revealed that majority of the households
preferred cow milk over buffalo milk due to its palatable nature with less fat content preventing digestive disorders. The study also revealed that majority of the households were found to be satisfied with the present fat content in standardized milk and toned milk. It was also found that consumers preferred to get their milk supply in 500 ml sachets and preference for 250 ml bottle was found to be maximum in poor income group.

Ganguly and Gopal (1981), conducted a study entitled 'Metropolitan Milk Market in India'. They have found that three-fourth of the milk in Bombay and Calcutta has been purchased by households with low or moderate income. Similarly half of the milk supply in Madras and Delhi was purchased by the same category of people. The study also highlighted that 95% of all the households bought milk regularly and 45% of them purchased exclusively from modern dairies under the city milk scheme. The study also concluded that the share of modern dairies in the liquid milk market had increased presumably because they charged 40% less than that of the traditional sector.

Satya Prakash Singh and Raghbir Singh (1986), in their article 'Consumption of milk products and income', have analysed the relationship between consumption of milk products and income in Chandigarh area. It was found that average monthly consumption increased with income for all milk products. Milk products produced by organized, unorganized and home made were also taken into consideration and it was identified that organized sector dominated all income groups.

Raghbir Singh (1986), carried out a study on 'Consumers perception of the organized sectors dairy products'. Consumers’ perception on dairy products manufactured by organized sector in comparison with unorganized sector was examined. The disagreement among the opinion of households if any belonging to different income and educational levels in this regard was also observed. The study concluded that as far as flavour, nutritional value, moisture content and digestibility were concerned, consumers did not have much difference of opinion between the organized and unorganized sectors’ dairy products.

Shanthi (1987), conducted a study entitled ‘consumers preference for Aavin milk and milk products in Royapettah and Mylapore in Chennai’. It was found that good quality coupled with low price was the main reason for consumer preference for milk and
milk products. Correct weight and convenience occupied the second and third place and hygiene, the last place. The quantity of milk purchase increased with increase in the size of the family. It was also found that consumption of Aavin milk did not increase with the increase in income.

Singh (1989), conducted a survey on ‘Consumers perception of the organized sector dairy products’. The data was collected from 394 households in Chandigarh. Consumers perceived that the milk produced from organized sector were more reliable, hygienic, tasty, cleanly packed and offer good value for money when compared with the products of the unorganized sector. Consumers' perception was not influenced by difference in income and education and perception of moisture content, digestibility, nutritional value and flavour were rated similarly for organized and unorganized sectors. The organized sector comprised industrial scale manufacturers and State Corporations, Co-operatives and Joint Stock companies whereas the unorganized sector comprised small-scale manufacturers and home-made products.

Sridharan (1991), in his article entitled 'A study on consumer preference for Aavin milk and milk products', aimed at identifying the steps to improve the quality of milk and milk products and also finding out the reason for customer dissatisfaction towards 'Aavin milk and milk products'. It was identified that the customers were not fully satisfied with regard to quality, behaviour of suppliers, price and time of supply. It was suggested that the outgoing milk and milk products must be checked and confirmed with prevention of food adulteration act. The article also suggested that the farmers were to be paid only on the quality of milk, not on the quantity so that adulteration can be avoided.

Jain, Kesavan and Jenseen Helen (1992), in their study entitled ‘Food demand analysis in India-An application of Almost Ideal Demand System’, made an attempt to study the consumption behaviour in a comprehensive manner, using the National Sample Survey (NSS) data, applied Almost Ideal Demand System Model to estimate the food demand system for different regions of rural and urban India. This model integrated both time series and cross-sectional data to estimate own and cross price. It was found that expenditure elasticities for urban areas were lower than the rural areas. It was also
understood that milk and milk products were observed to be luxury items exhibiting high expenditure elasticity. Own price effects were generally observed to be larger than the cross price effects for all the commodities including milk and milk products. The study suggested that consumers were more responsive to own prices rather than prices of other commodities.

**Patel, Kumar and Khera (1994)**, have conducted a study on ‘consumption pattern of milk and milk products’. Occupationwise consumption pattern of milk and milk products was studied in Karnal city among 352 households. The Engel Equation of Double Log form was used for estimating the expenditure elasticities. The concentration curve technique was also applied to study the inequalities in the consumption of milk and milk products for different occupational groups. It was also observed that the growth in demand for milk increased rapidly as per capita income increased. The expenditure elasticities were found to be higher for service families as compared to the business families and there were greater inequalities in the milk consumption for service families as opposed to business families.

**Daisy Rani (1995)**, undertook a study entitled 'Consumption pattern, consumer awareness and preference of selected livestock products'. For the purpose of the study, Madras city was divided into 12 sections. 300 households were randomly selected to find out the consumption pattern for the selected livestock products like meat, egg and milk. It was found that as the income increased the quantity of milk utilized also increased. It was also found that the awareness of various milk products like standardized milk, toned milk and double toned milk, yoghurt and skim milk powder also increased with the increase in income. The households irrespective of income groups preferred toned milk. Semi Log Functional analysis revealed that family size, monthly income and educational level of the head of households significantly influenced the milk consumption. The study concluded that the vegetarian habit also significantly influenced the milk consumption level.

**Gupta and Harpal Kaur (1995)**, carried out a study entitled 'Consumption pattern of milk and milk products in Union Territory of Chandigarh'. The study area comprised 47 sectors and out of these, two sectors were selected at random. Data were collected by survey method from a pre-determined sample of 150 households which was
randomly selected from these two sectors. Tabular analysis was carried out to portray the consumption pattern. The study revealed that the per capita milk consumption in the Union Territory of Chandigarh was significantly higher than the minimum recommended nutritional level. It was found that a major percentage of milk purchased by the household was utilized for making tea followed by 'using as such'. Among the various milk products, the highest consumption was of curd and lowest of ghee. The study found income as an important factor accounting for variation of milk consumption and except in poor and low income groups, there was no significant difference in the consumption of milk by vegetarian and non-vegetarian households among other income segments. The study revealed that at any rate, the per capita milk consumption was higher than minimum level recommended by Indian Council of Medical Research (ICMR) in all the income groups in the study area.

Gupta and Dev Raj (1995), carried out a study on 'Consumption and disposal of milk in Churu District, Rajasthan'. The study has been undertaken to examine the consumption and marketed surplus of milk as a proportion of total milk production and to study the utilization of milk for different consumption purposes by different categories of households. A total sample of 103 households was drawn for the study from the two villages on the basis of probability proportional to the total number of households of each category in each selected village for the period of 1990-91. Marketed surplus of milk was computed by deducting the household consumption from the total milk production of the household. The study revealed that a major portion of the milk production has been retained for family consumption and the marketed surplus was relatively low owing to inadequate marketing facilities in the study area. In addition to the consumption of milk in fluid form, the consumption in the form of ghee was also quite substantial. The study suggested that to enhance the marketed surplus of milk it was imperative to improve the marketing facilities in this part of arid zone.

Bhagwat and Milind Shaligram (1997), conducted a study on 'Pattern of milk consumption in rural households of five selected states of India'. The study was family based conducted by Bharatiya Agro-Industries Foundation (BAIF) Development Research Foundation. A cross-sectional study was done amongst 1515 families in five states namely Karnataka, Maharashtra, Gujarat, Rajatthan and U.P. A house-to-house survey was
conducted in a group of selected contiguous villages, using a semi-structured schedule. The families surveyed were divided into four socio-economic classes – upper, upper-middle, lower-middle and lower, 13 factor scale was developed for the purpose of the study. It was found that the poor people, even if they produce milk, their personal nutrition has not improved, as most of the milk produced is being sold for income, rather than keeping adequate quantity for family consumption, especially in the states of Maharashtra, Gujarat and Rajasthan. It was suggested that to promote milk consumption at home, the rural people must be made aware of the nutritional benefits of milk through health education.

**Daisy Rani, Selvam, Safiullah and Prabakaran (1999)**, carried out a study on 'Consumption pattern and consumer preference for milk products in Madras city'. For the purpose of study, 300 sample households were selected from twelve divisions of Madras city using pre-stratified random sampling technique. The analysis of data was done by conventional, tabular and functional methods. For the functional analysis, Semi-Log function was used. The results of the study revealed that the monthly consumption of fluid milk per consumption unit varied from 3.61 to 17.7 kg and the number of households consuming milk was 100% in all income groups. The preference of the households was found more for toned milk in all income groups. Increases in family size, monthly income and educational level of the head of the households were found to increase the level of consumption of milk and milk products. The study also revealed that vegetarians consumed more milk to compensate their protein requirements. It was suggested that increasing the literacy level and imparting more information about the nutritive value of milk and milk products would certainly enhance the consumption of milk even among the low income groups.

**Thiagarajan (1999)**, by conducting a study on 'Marketing of Aavin milk in Madurai', has identified that 90% of the milk market was in the hands of Aavin by maintaining a standard quality with a low price. But recently, its percentage has been found to decline to 66% due to internal causes such as limited quantities for a limited time in a day, dual pricing for regular users and for special orders and cumbersome procedures involved in distribution and external causes like entry of competitors and natural factors leading to short supply of milk.
Jain and Sharma (1999), carried out a study entitled 'Consumer opinion for purchase of milk and milk products'. Data was collected from 300 households in Chandigarh city, 150 households in Rohtak town and 100 households from two villages of Rohtak District in northern region. Similarly data was also collected from 300 households of Bangalore city and 150 households from Mandya town and 100 households from two villages in Mandya District in the southern region. The factors examined were sources of purchase of milk and milk products, consumers’ preference for different sources and factors influencing purchase choice. It was found that the majority of consumers bought milk and milk products from unorganized sectors in urban areas. It was found that in rural areas, consumers depended on home made products and only a small number of consumers bought from the unorganized sector. Price was found to be an important factor influencing the purchase in the South and was less important in the North. It has been concluded that efforts should be made by the organized sector to expand its urban as well as rural markets through mass awareness campaign. Further it was suggested that the dairy products should be made available to the consumers in convenient sized packets at an affordable price.

Rakesh Saxena (2000), in his study entitled 'Dynamics of Demand for milk in this millennium', aimed at analyzing the latest available Nation Sample Survey (NSS) data for 1993-94 on consumption of milk and milk products, to estimate the value of income elasticity at national and regional level and to estimate the demand function for milk by using the time series data at the national level on milk consumption, income and price indices in order to project demand for milk in the coming years. The regression analysis has been done for estimating the transcendental function to obtain the income elasticity for milk and milk products for the country as a whole. According to the study the level of income and price are the most important factors influencing demand for milk and milk products. People living in the northern and western region spend high proportion of their income on milk and milk products as compared to other regions of the country. The study also revealed that the income elasticity of demand for milk and milk products has been reduced with an increase in per capita national income. The total national demand for milk is expected to stagnate towards the end of next decade or slightly later.
Data and Ganguly (2002), carried out a study entitled 'An Analysis of Consumer Expenditure Pattern in Indian State with special reference to milk and milk products'. The study was an exercise to estimate income elasticity for each state's urban and rural population, to provide inputs to future milk marketing strategies in India. The functional relationship between household expenditure in a family budget and consumption expenditure of different items was analysed through appropriate forms of Engel's Law of demand. The study revealed that of the food items, cereals constitute the single largest item of expenditure both in rural and urban areas followed by liquid milk. It was also found that, the milk group namely, Liquid Milk (LM), Milk Products (MP) and Milk and Milk Products (MMP) occupied prominent place and raised steadily with income in both urban and rural areas and also the rural Liquid Milk demand was found to be more sensitive to change in income compared to urban. The study also observed that the states like Kerala, Karnataka, Maharashtra and Tamil Nadu have higher rural elasticity compared to urban.

Prabhakar Sharma and Joglekar (2002), conducted a study entitled ‘Marketing of milk – An opinion survey of Consumer perceptions in Rajahmundry – Andhra Pradesh’ aimed at studying the attitudes of the consumers towards the dairy milk and analysing the reasons for household choice for milk from the private vendors. Effort was made to include a cross section of consumers covering the area of the Godaveri Co-operative Dairy (GCD) with a sample size of 400 households. Questionnaire has been designed for the purpose of collection of data. The study found that majority of the families were purchasing milk from private vendors. It has been found that one of the main reasons for not purchasing milk from the Dairy is the non-availability of Dairy milk within reasonable distance from the residence of consumers. Majority of the families felt that the supply of milk through polythene sachets by home delivery is advantageous and also expressed that the milk supplied by the GCD is of medium quality. The quality of the milk was judged mainly on the basis of level of fat content in milk. Families of lower income groups strongly preferred private vendors due to the availability of milk in small quantities, less than half a litre.

Seethalakshmi and Lalitha (2002), conducted a study entitled 'Consumption of milk at source', in Dindugal District, Tamil Nadu. The objectives were to study the per
capita household consumption of milk and to examine the relation between income and per capita consumption level of the respondents. Multi stage sampling method has been adopted for the selection of dairy units under different categories of management namely members of cooperative, beneficiaries of Non-Government Organizations (NGOs) and the individual operators. From each category 25% of the sample was selected to study the milk consumption pattern. The study observed that per capita milk consumption is much less than the nutritional requirement in all the three categories. The study also revealed that, in all income levels of the three categories of respondents, there was a considerable percentage of families not consuming milk at all. The study concluded that the major constraints in milk consumption was not only the limited production of milk, but the low purchasing power of the majority of people. According to the study, cattle owners in general being economically poor have the tendency of selling every drop of milk to get maximum cash return to buy other essential food items or meet the other expenses. It was suggested that extension services should aim at discouraging unhealthy habits like excessive consumption of coffee and tea in unhygienic coffee bars and tea stalls which is one of the reasons for low and non-consumption of milk at home.

Bandyopadhyay and Gosain (2002), in their study entitled 'Consumers perception towards quality of selected dairy products', analysed the consumers behaviour towards the quality of five selected dairy products, manufactured at the National Dairy Research Institute. The perception of the selected 100 male and 100 female consumers using these dairy products were ascertained for different attributes like taste, flavour, quality, package and cost. The relationship between socio-personal profile of the consumers and their perception towards the attributes of selected dairy products has been discussed. It was found that irrespective of the gender except for the price of paneer and packaging of ghee, the respondents had a fairly good perception towards other attributes of these dairy products. Females of lowest income group had a good perception of the flavour and taste of lassi and males of high income group perceived the packaging of flavoured milk to be better. It was also suggested that the different dairy products sold in the market should be manufactured matching the perception of the different segments of the consumer population.
Jhala and Singh (2002), carried out a study on 'Production and utilization patterns of milk in tribal families of Rajasthan'. An attempt has been made to assess the production potential of milk and buttermilk and their utilization pattern amongst the tribal families of Rajasthan. Eighty tribal households were randomly selected from sixteen villages of four Districts having sizeable tribal population. The families were categorized into marginal and small farmers. The sale of ghee generates income for the family, milk is used mainly for ghee production. A part of milk produced was consumed as fluid by children and ailing family members while the other members use it for tea making. It was suggested that appropriate technology development is needed to utilize the surplus of buttermilk for value addition and long shelf life product manufacturing to meet the animal protein needed by the family during the scarcity of milk and butter milk.

Jagadish Badola (2003), in his article entitled ‘Behavioural study of consumer buyers of Dairy Products’, made an attempt to study the behavioural patterns of consumer buyers of dairy products in Uttar Pradesh. For the purpose of study, the consumers were divided into rural consumers consisting of farming and non-farming group and urban consumers consisting of business family and service class family. Survey method of research was adopted for which questionnaire was used to collect the information from a sample of 100 consumers. The findings of the study revealed that 87 per cent sample families were nuclear and the size, composition of family, occupation and annual family income has direct bearing on the level of consumption of dairy products. Major portion of the total expenditure on dairy products was found to be on liquid milk followed by ghee and butter and consumption of unbranded products was found to be very common in case of liquid milk. On overall basis, sample households were found to be consuming milk in excess of their requirements as per Indian Council Medical Research (ICMR) norms except in case of rural non-farming class and low income service class. The study concluded that, the most desired attribute for purchasing of milk was the brand which was on basis of low pricing, good flavour, availability, freshness, quality and packaging, advertisement and sales promotion and others.

Paramashivaiah and Aravinkulkarni (2003), in their case study entitled 'Consumer Attitude towards pasteurized milk', aimed at finding out the attitude of the users of pasteurized milk in rural areas of Gulbarga District in Karnataka state and also to
find out the preference of rural consumers for the pasteurized milk on the basis of their age, sex, education and income. A survey was conducted with the help of a structured questionnaire in the two villages of Gulbarga District. Sixty people from each village were randomly selected and interviewed personally to gather required information. It was found that children below the age of 15 years were provided with more pasteurized milk than unpasteurized milk. Literates preferred pasteurized milk while consumers with little income do not prefer pasteurized milk. It was suggested that suppliers of pasteurized milk should introduce smaller packs in rural areas and lower the price of the milk, full cream milk, to make it more affordable for the poor rural consumers.

**Sivasubramanian (2003),** in his article entitled, 'A Study on per capita milk consumption among consumers', examined the per capita milk consumption in Chennai city and Chidambaram town in Tamil Nadu, India, as well as the relationship between milk consumption, income and education. Data were collected from 300 consumers representing Chennai and Chidambaram. The result revealed that per capita milk consumption in Chidambaram falls behind Chennai and also the per capita milk consumption was found to be increasing with an increase in income status and educational attainment.

**Venkateswarulu, Reddy, Khalellu and Rao (2004),** in their study entitled 'A Survey report on quality of market milk sold in Chennai city', aimed at finding out the awareness of consumers for the market milk and studying the day-to-day quality of popular market milk brands in Chennai. 104 samples of branded milk of different brands were procured from local market in and around Chennai city. The milk samples were tested for acidity and Solids-Not Fat (SNF) content. The data obtained were analysed using one way analysis of variance technique. The study revealed that there was increased awareness of consumers for the market milk and stiff competition among the different brands sold in the market. The private dairies maintain the minimum standards meeting the Prevention of Food Alteration (PFA) requirements according to the study and some of the brands were also made to keep high standards to gain advantage over the rival brands. The study indicates that privatization and phenomena of globalization have created a competitive market for milk for the advantage of the common consumer. The study has suggested for a straight market control mechanism to prevent adulteration.
It also recommended that either Government agencies or municipal authorities should prevail upon the quality standard for the safe and hygienic quality of the milk to the consumers.

**Santhi (2005),** conducted a study on ‘Buyer-Behaviour of Urban house holds in fluid milk markets with reference to Coimbatore District’. The study aimed at analysing the fluid milk consumption and pattern of utilization by the households and also to identify the determinants of milk type purchased by them. The study also analyzed the buyer behavior with respect to price, promotion and distribution of fluid milk. Multi-stage sampling method was adopted. Likert-type five point scaling technique was used. Chi-square, Anova, Logit, Regression model and Factor analysis were applied. The study found that TV advertisement was effective in creating awareness on the presence of bacteria in milk and pasteurization process kills bacteria in milk. The study also found that majority of consumers bought branded milk due to reference group influence apart from personal preference and unbranded milk is influenced by milk vendors.

**Ansari and Datta (2007),** in their article entitled ‘Preservation of Liquid Milk using Emerging Technologies’, have aimed at finding out the technological need for preservation of Liquid Milk. It was observed that increased market opportunities for fluid milk include higher consumer demand for new convenience food products and longer shelf life needs and these needs have forced the milk processors to investigate and incorporate new technologies of preservation. It was found that consumers increasingly perceive fresh milk as healthier than Heat-Treated milk. It was suggested that, emerging technologies should maintain most of the fresh attributes, safety and nutrient value of milk.

**Santosh Singh Bais and Ramesh Agadi (2008),** conducted a survey of consumers and milk vendors on 'marketing of branded dairy milk products in Gulbarga District in Karnataka'. Their specific objective was to know the types of brands of Dairy milk marketed in the Gulbarga District and consumer response towards them. The primary data has been collected by conducting field survey with structured questionnaires. The sample consists of retailers numbering sixty and three hundred consumers in Gulbarga city only. Garrets Ranking technique was used to rank the factors influencing the dairy milk products preferred by consumers and retailers. According to the study, the
purchase of milk is mainly from the vendors and varied consumption pattern occurs mainly due to summer vacation and festivals. The study also revealed that housewife is the main person in choosing the brand of milk and the educational background of the respondents have great implication in the milk market. It was also found that the good quality was ranked as first among the variables influencing brand of dairy milk products. The study also disclosed that the reason for consumers' switch over to other brands as quoted by them was 'inconsistency in quality of the milk'. The results of the study also revealed that a considerable percentage of consumers have got the awareness regarding various brands of milk through television advertisement. The study recommended the manufacturers to reduce the selling price of the dairy milk so that it can be made affordable to the lower income groups. The study also suggested that, the manufacturers to make effective advertisements and undertake sales promotion to create awareness. The suggestions also included avoiding the bad smell and improving the quality of milk and also reducing the fatness of milk.

**Ganapathy, Kanniah and Anbumalar (2009)**, in their study entitled 'Consumer loyalty for processed milk with reference to Coimbatore city', were aiming at knowing the prevailing trend of customer loyalty towards processed milk consumption and studying the customers' loyalty linkage with consumer behaviour for processed milk consumption. Descriptive research was undertaken and the study was based on primary and secondary data. An interview schedule relevant to the requirement of the study was prepared. A sample of 150 respondents was selected using convenient sampling method. According to the study, Aavin milk occupies the first place when compared with other brands. The study concluded that convenient usage and better quality are the two important factors that have made people choose processed milk and also it is not necessary that the consumers who are loyal to a particular brand would always remain the same. It was found that there is always a dilemma in the minds of people because most of them are ready to buy a competitive product if it is sold at a lesser price. It was suggested that in order to increase the loyalty of consumers and to capture new customers and retain old ones the companies should understand the customers' taste, preference and choice along with the availability, suitability, price and hygienic factor of their product.
Palanianppan and Sengottaiyan (2010), in their article entitled ‘Dairy Industry-Increasing demand puts pressure on production’, aims to find out the reasons for expected increase in demand for milk and milk products in India and also the threats in expansion of traditions sources of feeds. According to them, milk and milk products’ demand is expected to grow very rapidly with population growth, urbanization, increase in income levels and change in food habits. It was also observed that the increase in demand for the dairy products will put increasing pressure on dairy production systems. Indian dairy farming has been found to be dependent on crop residues, natural resources and open grazing as sources of feed. It was also mentioned as a threat that, expansion of the traditional sources of feeds and fodder to support a large increase in dairy production is unlikely, as the available grazing areas and other common resources are shrinking and already degraded.

3.4 CONCLUSION

Studies, both in India and abroad, have extensively examined the consumption of milk and milk products in detail. Research works that have undertaken on the awareness of consumers on milk are relatively scant. Awareness on the nutritional values of milk is mandatory for the consumers so that they would realize its importance in their daily life. Hence the researcher has concentrated in finding out to what extent the consumers are aware of the contents of milk, its values and essentiality. The present research work also takes into consideration the factors that influence consumers towards the purchase of milk and their consequent behaviour. Studies reviewed indicate that, no study has been carried out on consumption milk based on segment namely Nuclear and Joint family segments as well as Branded milk and Unbranded milk segments. Inorder to fill this vacuum, the present study has also been undertaken on these areas.
REFERENCES


