

**STUDIES ON THE CONSUMPTION PATTERN OF MILK AND
MILK PRODUCTS IN URBAN AREAS OF
RAYALASEEMA REGION (A.P.)**

**THESIS SUBMITTED TO THE
ANDHRA PRADESH AGRICULTURAL UNIVERSITY
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF
MASTER OF VETERINARY SCIENCE
(DAIRY PRODUCTION)**

By

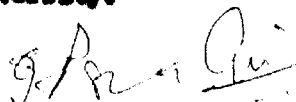
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JULY 1986

CERTIFICATE

Sri Srinivas Rao, Y. has satisfactorily presented the course of research and that the thesis entitled "STUDIES ON THE CONSUMPTION PATTERN OF MILK AND MILK PRODUCTS IN URBAN AREAS OF RAYALASEEMA REGION (A.P.)" submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that the thesis or part thereof has not been previously submitted by him for a degree of any University.



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This is to certify that this thesis entitled "STUDIES ON CONSUMPTION PATTERN OF MILK AND MILK PRODUCTS IN URBAN AREAS OF RAYALASHEMA REGION (A.P.)" submitted in partial fulfilment of the requirements for the degree of Master of Veterinary Science (Dairy Production) of the Andhra Pradesh Agricultural University, Hyderabad, is a record of the bonafide research work carried out by Sri SRINIVAS RAO, Y. under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee.

No part of the thesis has been submitted for any other degree or diploma or has been published. All the assistance and help received during the course of the investigations have been duly acknowledged by him.


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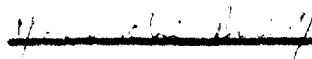
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ABSTRACT

The consumption pattern of milk and milk products and the consumers preferences by way of conventional survey was made during January, February and March, 1988 in Chittoor, Tirupati, Cuddapah and Kurnool towns of Rayalaseema Region among different monthly income groups, dietary categories, family categories of various occupational activities under different religious faiths. A total number of 1199 families randomly selected were interviewed using a questionnaire structured for the purpose.

The per capita milk utilization per day in all liquid form had a direct relationship with the monthly income of a family. The trend in the purchasing power and utilization of milk in the form of fluid milk and fermented milk seemed to be directly related to the magnitude of the monthly income of the families while the percentage of milk utilized as milk based hot drinks like tea or coffee showed an inverse relationship. The utilization of meat in the families seemed to have a depressing influence on the purchasing power of milk and per capita

utilization of milk in all liquid forms. The non-vegetarians were found to be utilizing less milk as fermented milks and beverages than vegetarians while the reverse trend was noticed in the case of milk utilization as milk based hot drinks.

In general, the monthly expenditure per family on milk was found to be decidedly higher than the expenditure on meat and eggs in all the income groups and both the dietetic groups. The per capita monthly expenditure on milk and milk products was found to be more in Hindu-Faith, less in Other-faiths and least in Islamic-Faith. The preference to butter milk and curds was found to be decreasing while the preference to ghee, ice cream and skim milk powder was increasing with the increase in income. It was observed that a majority of the families under different income groups showed preference to cow milk than buffalo milk and preferred to buy the milk from Andhra Pradesh Dairy Development Co-operative Federation (APDDCF).

The expenditure elasticities of milk and milk products decreased with the increase in monthly income. The per centage expenditure on milk and milk products decreased with the increase in per capita total expenditure per month. There was a high degree of inequality in the expenditure on milk for service and business categories as indicated by Gini's concentration values.

This study concludes that there exists a great demand for milk and milk products in Rayalaseema region which can be exploited by improving the functioning of APDDCF.

CHAPTER I

INTRODUCTION

"Milk" is nature's ideal food and certainly the first food for human beings. Milk and milk products form an integral part of a typical Indian diet.

The demand for milk and milk products is increasing rapidly because of population explosion, rapid urbanisation and increased income and literacy level of people. The food consumption pattern of a community varies due to many factors like socio-economic status, dietary habits, religious and cultural factors, occupational activity, family size and geographical environment etc.

The need for location specific studies on consumption pattern of milk and milk products has been realized by scientists, economists and policy makers to formulate strategies to improve the efficiency of distribution and to promote consumption. Such studies help in the planning of the milk production based on future demand and the liking of the consumers. They also assist in developing a comprehensive long term marketing approach involving budget planning, planning of product range, identification of target groups and regional markets, pricing, advertising etc., for increased sales and economic success in dairy industry.

Andhra Pradesh is a typical state where the North and South Indian cultures merge, with a population of about

60 million belonging to different cultures. Ecologically, the state could be divided into three regions, namely the hot and humid coastal Andhra, the dry central plateau (Telangana) and the arid, rocky Rayalaseema with a profile representing a high degree of variation. Andhra Pradesh is a surplus state for milk production with well maintained cattle and buffalo population and an active Andhra Pradesh Dairy Development Co-operative Federation (APDAF) with its many dairy plants and well established "VILVA" brand milk products. With the implementation of operation Flood I and an ambitious dairy development programme envisaged for the next seven years under Operation Flood II, a rapid increase in milk production in this state can be expected.

Keeping this in view, an attempt was made to study and to assess the consumer preferences and the consumption pattern of milk and milk products in the Rayalaseema region under given market conditions among different groups vis-a-vis income, dietary habits, religion, occupational activity, family size, etc.

This study is designed to provide information with regard to

(a) consumption pattern of milk and milk products in a family and per capita consumption per day under different income, dietary, occupational and religious faiths.

(b) The comparative monthly expenditure on meat, eggs and milk.

(c) Preference to different designated milks and milk products under different categories of income, dietetic habits occupational activities and religious faiths.

(d) The expenditure elasticities for milk and milk products.

CHAPTER II

REVIEW OF LITERATURE

2.1 FACTORS DETERMINING MILK AND MILK PRODUCTS CONSUMPTION

Prinegon (1961) stated that price was the main factor which affects milk consumption in the short run and income was the major factor which affects milk consumption in the long run. The income elasticities of demand for milk in developmental areas were 0.62 and in non-developmental areas 0.82.

Govil et al. (1966) conducted family diet surveys in U.P. and revealed that consumption of milk, vegetables, sugar and fruits increased with the rise in income. There was no concomitant rise in the percentage of money spent on food with the rise in income.

Orwerk (1968) in a study revealed that the demand for milk was influenced by the price and income in Netherlands and the price elasticity of the demand for milk was somewhere between 0.13 and 0.27.

Bose (1960) fitted the linear consumption function for studying expenditure elasticities of milk and milk products for various levels of expenditure with the help of NSS data and found them to be between 1.4 and 2.4 in rural areas and about 1.3 in urban areas. The expenditure elasticities were found to decrease with the rise in expenditure levels.

Ganguli (1960) studied the consumption pattern of milk and milk products and other food items for three occupational groups viz., farmers and cultivators, agricultural labourers and other occupations and stated that pattern of consumption in different occupation groups were different for almost all the commodities.

Follock (1960) interviewed about 300 households in Ohio (USA) on milk purchasing habits. He found that per capita milk purchases were not affected by changes in household size but, declined where the household income decreased. It appeared that milk was highly inelastic commodity with regard to price and household income and changes in consumption were related to non economic factor.

Hudra and Binal Roy (1960) studied the factors determining the consumption of milk and milk products in addition to other commodities by using 1955 data. Rural consumers were found to consume more on food items than their urban counterparts while demand for non-food items was more for urban consumers. The quantity elasticity of milk was estimated to be 1.45 to 1.68 for urban and rural areas respectively. The value elasticity of milk was 1.68 for urban households and 1.70 for rural households.

Johnston (1963) conducted a survey on domestic expenditure in Canada and concluded that the number of children in the family was the main factor in deciding the amount of milk bought.

Paul Jonas (1971) reported that the expenditure and income elasticities of milk and milk products for rural India were observed to be significantly higher than for metropolitan area. Delhi showed the lowest elasticities and as a contrary, the highest per capita consumption of milk and milk products. Erratic and hardly predictable consumption pattern was noticed in Madras city.

LeBaron (1973) analysed cross section data from 1879 families in 8 U.S. cities in a study of demographic factors affecting family purchases of frozen desserts namely sherbat, ice milk and ice cream. The factors were age, education and race of home maker, family income, house-hold size and occupation. Analysis of variance indicated that household size, age of home maker and family income had the greatest impact on consumption pattern.

Lu and Marshall (1973) analysed the demand for fluid milk in Ontario and found that (a) per caput consumption of fluid milk was unrelated to disposable income or to price of substitute products (b) price elasticity of demand at farm level ranged from -0.20 in South Ontario to non-significant response in North Ontario (c) Summer milk consumption was below average (d) Consumption increased less rapidly than income (e) Positive effects of increasing income on milk consumption were offset by negative effects of changes in consumer preferences.

Boehm (1977) obtained data on fluid milk consumption from 22 major cities for the period 1966-1976. Average daily consumption was 0.713 lb (260 lb per year). Retail prices, income, age, sex and ethnic composition of population were the important factors affecting milk consumption.

Reddy and Paramma (1977) studied the factors affecting food habits of rural people in Chittoor district. The percentage expenditure on food decreased as the income level increased. There was positive correlation for the income and expenditure pattern on fresh foods and milk and milk products.

Singh et al. (1978) stated that about 11 per cent of total income per month was spent on milk and milk products, particularly milk and ghee, in Vijayawada on the basis of a survey in 1976. Per capita expenditure on milk and milk products increased with income level but, expenditure elasticity (overall value 0.8584) was greater than unity only in poor and lower middle income groups.

Huang and Radulic (1979) conducted a survey of whole and low fat milk purchases by 120 white and non-white households in Georgia and showed that white households purchased more fresh milk than non-whites. Households with young children. Income had less influence on expenditure for each type of milk than did race or household composition.

Ganguly and Gopal (1980) reported that in Bombay and Calcutta 85 per cent of milk was bought by house-holds with low or moderate income, but in Delhi and Madras about 80 per cent of all milk was purchased by high-income house-holds. In Delhi and Bombay the average house-hold devoted 12 per cent of its expenditure to milk and milk products versus 8 to 9 per cent in Calcutta and Madras. Ninety five per cent of all house-holds interviewed in Delhi and Bombay bought milk regularly.

Sawayama *et al.* (1980) reported that intake frequencies and affinity indices were highest for cow's milk, with slightly lower levels for buffaloes, and goat's milk in Phillipines. Cow's milk had the highest scores in all utilisation classes viz., drink separately, used in cooking or included in milk products.

Kesari Kumar (1981) conducted a survey to find out the consumption pattern of milk and milk products in Hyderabad city. He reported that per capita milk utilization per day was found to be increasing with the increase in income level. The monthly expenditure on milk was found to be decidedly higher than the expenditure on meat or on eggs in all the income groups.

Prabhakaran and Patel (1981) studied the factors affecting expenditure on milk and milk products in Madras city by using

linear, semi log and log/linear functions to relate per capita monthly expenditure on milk to monthly income, family size, education of family head and dietary habit. A log / linear function gave the best result. Expenditure on dairy products was correlated positively with income and food habits and negatively with family size. The effect of educational status was not significant.

Singh et al. (1981) stated that on an average farm in Punjab State about 3.8 milch animal units were maintained and 3370 litres of milk was produced out of which 22 per cent was sold, 45 per cent consumed at home and 33 per cent converted into other products. Per capita consumption of milk was about 0.86 litres on an average farm in the state.

Huang et al. (1982) reported that consumption of whole milk tended to decrease and that of low fat milk tended to increase as income increase. House-holds with children consumed more liquid milk than house-holds without children, but the presence of children did not greatly affect the proportion of whole milk to low fat milk.

Prabhakaran and Patel (1983) interviewed 300 house-holds in Madras city and found that 55 per cent of the house-holds consumed less than one litre of milk per day while 3 per cent consumed more than 2 lbs/day. The vegetarian house-holds consumed higher quantities of milk compared to non-vegetarians.

The per capita consumption of milk was 188 ml per day in poor group as against 280 ml per day in higher income group. About 39 per cent of milk purchased was utilised for coffee preparation and 19 per cent was consumed as such. The quantity of milk products consumed tended to increase with the increase in income level.

Swarn Lata et al. (1983) conducted a survey of 240 house-holds in order to estimate the expenditure and income elasticities for milk and milk products in rural and urban areas of the Karnal district in Haryana. Total consumption expenditure in the urban areas was almost double of that in the rural areas and the per capita expenditure on milk and milk products, meat and eggs was remarkably higher in the case of urban consumers. The consumption of milk products other than ghee was conspicuous by its absence in the rural areas. Rural people spent about 19.2 per cent and urban people spent 21.96 per cent of their income on milk and milk products.

Kesavan and Kalla (1984) analysed determinants of milk and milk products consumption by rural and urban families in Kerala and found that the distribution of total family expenditure varied, with the urban population spending more in absolute terms on all items. An increase in income would result in increased consumption of milk while any increase in

consumption expenditure on other items from the existing consumer budget without increase in incomes, would result in decline in consumption of milk.

Usha Anand and Sobal (1984) selected at random 76 families of dairy farmers in three districts of Haryana to study the milk consumption behaviour in Haryana. They concluded that the educational level of the parents did not have any relationship with milk and milk products consumption by infants and no increase in consumption was observed, in case of educated parents. No difference in the quantity of milk consumed by the female or male child was observed as long as the family could afford to give milk to their children.

Panwar (1985) analysed milk consumption data of 100 families collected through a pilot survey in 4 towns of Rajasthan. The results suggested that there was a high degree of correlation between milk purchased and income of the family, low degree of correlation between quantity of milk purchased and family size and very little or a chance correlation between income and size of family. He also indicated that every rise in income by 100 rupees would increase the demand for milk by 130 millilitres and every additional member of the family would increase milk consumption by 60 ml.

2.2 INCOME AND EXPENDITURE ELASTICITIES FOR MILK AND MILK PRODUCTS

National Council of Applied Economic Research (NCAER) (1961) studies on consumption pattern of milk and milk products revealed expenditure elasticities of coefficient of milk and milk products to be close to 1.5.

Mellor and De Ponteves (1964) estimated the coefficient of expenditure elasticities for milk and milk products to be 1.86 and 1.78 respectively from the data of NSS rounds.

Sinha (1966) estimated the consumption fraction on the basis of cross-sectional data provided by the reports of NSS. Milk products had elasticities of more than unity in all the regions with Eastern India having the highest figure and Western India the lowest. The expenditure elasticities for milk and milk products for India as a whole, were higher in rural than in urban areas. The expenditure elasticities for milk and milk products were 1.38 for all India rural and 1.24 for urban areas.

NCAER (1967) compared the consumer expenditure of developmental and non-developmental areas in India and reported lower income elasticity of demand (0.62) in developmental areas as against 0.82 of non-developmental areas. The consumption of milk and milk products increased sharply with income. The demand for milk and milk products showed an increasing trend with increasing education.

Bal and Bal (1970) analysed data of 10th round NSS survey and generated expenditure elasticity for milk and milk products to be 1.62 and Gini's concentration ratio to be 0.3

HCAER (1970) derived the partial income elasticity of milk and milk products to be ranging from 0.87 to 0.92.

Singh and Singh (1971) estimated the expenditure elasticity coefficient for milk and milk products to range from 0.4 to 1.23.

January et al. (1972) reported the price and income elasticities for milk to be 0.287 and 0.169 respectively.

Iyengar and Jain (1973) derived mean income elasticity coefficient for non-cereal food items including milk and milk products to be 1.66 for rural and 1.14 for urban families

Patel et al. (1974) studied the consumption pattern of milk and milk products of 352 urban house-holds in Karnal and reported that expenditure elasticities were higher for lower income groups and for service families than for high income groups and business families. There were greater inequalities in milk consumption in service families than in business families.

Karam Chandani (1976) reviewed food expenditure patterns in Canada and stated that per caput expenditure on dairy products rose by 28 per cent while expenditure on butter

dropped by 11 per cent during 1969 and 1974. Expenditure on dairy products had increased most (38.2%) in the highest income quartile but the share of dairy products in total food expenditure had fell from 12.0 to 10.4 per cent.

Stankovic and Nikelic (1976) used covariance analysis to investigate differences in Yugoslav consumption of milk and dairy products and its share in house-hold expenditure. The main differences in milk consumption were related to income but the income elasticity of milk had declined from an average level in 1963 to a low level in 1973.

Wohenecker (1977) stated that income had the biggest influence on demand for dairy products in Austria. Income elasticity of demand was highest for yoghurt followed by cultured milk, cream and condensed milk. Demand was income inelastic for cheese, butter and liquid milk. Condensed milk had the greatest price elasticity of demand.

Chan (1980) estimated income elasticities for food commodities by principal component analysis and obtained a value of -0.2323 for dairy products (as against 0.3310 obtained by application of regression).

Rao et al. (1982) conducted a study on consumption pattern in Vijayawada (A.P.) and estimated expenditure elasticity coefficient to be 0.8584 and income elasticity coefficient to be 0.7468 for milk and its products.

Vanegas - Fonseca (1982) reported that price elasticity of total milk supply was inelastic in the long run. The price elasticity estimates for individual dairy products were 0.61 for fluid milk, 1.23 for cheese and 1.07 for butter. The level of real income, dietary habits and existing levels of consumption were responsible for the marked differences of price and income elasticities of demand for individual dairy products.

Swarn Lata et al. (1983) reported that expenditure on liquid milk was inelastic in urban house-holds. The expenditure elasticities were 1.8589 for rural areas and 1.1242 for urban areas while income elasticities were 1.4976 for rural areas and 0.9730 for urban areas for milk and milk products.

CHAPTER III

MATERIALS AND METHODS

3.1 MATERIALS

3.1.1 Selection of Booths

For this study, by way of survey, few booths of milk distribution were selected at random in Chittoor, Tirupati, Kurnool and Cuddapah towns wherein the Andhra Pradesh Dairy Development Co-operative Federation (APDDCF) supplies the milk to the consumers.

In Chittoor town, two booths were selected out of the existing three booths. The selected booths were Greenspet and Church Street.

In Tirupati Town - 3 booths were selected out of 12 booths i.e., Balaji Colony, Maternity Hospital and Bhavani Nagar for the collection of data.

The 3 booths i.e., seven roads, 800's colony and Gandla Street were selected out of the seventeen booths in Cuddapah Town.

The data was collected from the consumers who purchase the milk from the milk booths at B Camp I, SAP Camp and Budharpet out of the 39 booths in Kurnool Town.

The milk booths were selected at random. About 10 per cent of the total booths were covered under this survey in all towns except in Kurnool.

3.1.2 Enumeration

Enumeration of various house-holds in the concerned booth area was carried out with the help of APDDCF staff of the concerned milk booths and also by door to door survey. Consumers buying milk from private sources (other than APDDCF) were also interviewed to give an overall picture of the consumption pattern of milk and milk products.

3.1.3 Collection of Data

The data were collected by conventional survey method by personal interview and door to door survey. About 300 consumers were interviewed from each town and the questionnaire was prepared as shown below:

1. Name of the Head of the family
2. Educational status
3. Monthly income
4. Religion-Hindu/Muslim/others
5. Occupation: Business/service/others
6. Composition of family

Males

Females

Children below 3 years

Children below 12 years

7. Food habits - Vegetarian/Non-vegetarian
8. quantity of milk purchased daily
9. Amount spent on milk per month
10. Name of the booth/zone

11. Quantity of other milk products purchased:

curds

Ghee

Skim milk powder (SMP)

Ice cream powder

Cheese

Khoya

12. Amount spent on milk products (in rupees/month)

13. Amount spent on eggs per month

14. Amount spent on meat per month

Items of consumption	Monthly income (Rs.)				
	<500	501-1000	1001-1500	1501-2000	>2000

Milk consumed as

(1) Fluid milk (ml)

(2) Bournvita, Horlicks etc. (ml)

(3) Milk based hot drinks (tea, coffee).

(4) Fermented milks

15. Additional information:

a) which milk do you prefer - Cow/Bufferalo/ toned

b) which one do you prefer - APDCCF/Private sector

c) which milk product do you like most -

Butter milk/Curds/Ghee/Kulfi/SMP/ice cream/
Flavoured milk/Khoya/Lassi.d) would you like to increase your purchase of milk
if your income increases: Yes/No

e) which one do you prefer - Eggs/Meat/Milk.

16. Remarks:

The data were collected during the months of January, February and March, 1986. The consumers were selected on a personal judgement basis so that a cross-section of consumers of different social status, occupation and income groups were given proper representation in the sample. The information obtained was with reference to the period of the month preceeding the month of enquiry. The data were mostly obtained from the house-wives.

3.2 METHODS

The entire sample of 1199 house-holds were classified into five categories in accordance with their income and two dietetic groups as vegetarians and non-vegetarians (meat consumers). The number of families and family members in each income and dietetic groups were as follows:

Sl. No.	Income groups (Rs./M)	Families (1199)		
		No.	%	Members
1	Below 500	150	12.51	606
2	Between 501 and 1000	293	24.43	1371
3	Between 1001 and 1500	294	24.52	1587
4	Between 1501 and 2000	252	21.01	1399
5	Above 2000	210	17.51	1302
<u>Dietetic Groups</u>				
1	Vegetarian	314	26.18	1718
2	Non-vegetarian	885	73.81	4547

The same sample of 1190 house-holds were re-classified into three categories each in accordance with major religious faiths and occupational activities. The number of families in each group were as follows:

Sl. No.	Religion	Families (1190)		
		Hos.	%	Members
<u>Religious faiths:</u>				
1	Hindu	977	81.46	8000
2	Muslim	123	10.34	777
3	Others	90	8.24	488
<u>Occupational activities:</u>				
1	Service	838	69.87	4337
2	Business	234	19.49	1368
3	Manual-work	127	10.58	560

The consumers were divided into six classes according to their educational status. The number of house-holds under each group were as follows:

Sl. No.	Education status	Hos.	%
1	Illiterate	106	8.75
2	Up to V Class	51	4.25
3	VI to X Class	349	28.10
4	Up to intermediate	227	18.93
5	Graduates	311	25.93
6	Post-graduates	156	13.01

The data was processed on ECIL MICRO 32 computer. The data was processed to find out the consumption pattern of milk in different forms, monthly expenditure pattern on meat, eggs, milk and milk products, per capita consumption of milk per day, preference to different designated milks and different milk products, per capita monthly expenditure on eggs and meat, milk and milk products, expenditure elasticities and Gini's concentration ratio of expenditure on milk and milk products.

3.2.1 Expenditure Elasticities

In order to estimate the expenditure elasticities for meat and milk products, an equation of the form

$$Y = a X^b \quad \dots\dots \textcircled{1}$$

was fitted employing linear least squares technique wherein 'X' is per capita total expenditure per month, 'Y' is the per capita expenditure on milk and milk products per month; 'b' is the expenditure elasticity of milk and milk products.

By taking logs in equation (1) we get

$$\log 'y' = \log a + b \log x$$

$$Y = A + b X \quad \text{where } Y = \log y$$

$$A = \log a$$

$$X = \log x$$

$$b = \frac{\frac{\sum xy}{n} - \left(\frac{\sum x}{n}\right)\left(\frac{\sum y}{n}\right)}{\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2}$$

$$A = \bar{Y} - b \bar{X}$$

$$\text{where } \bar{Y} = \frac{\sum Y}{n}, \quad \bar{X} = \frac{\sum X}{n}$$

$$a = \text{antilog } (A).$$

3.2.2 Gini's Concentration Ratios

To assess the inequalities in the expenditure of milk and milk products under different groups, graphical as well as algebraic form of concentration curves were used and Gini's concentration ratios were worked out with following equations

$$C = 1 - \sum (P_i - P_{i-1}) (q_i + q_{i-1})$$

C = Concentration ratio

P_i = Cumulative % of families for i^{th} income or religious group.

q_i = Cumulative % of expenditure on milk and milk products per family for i^{th} income or religious group.

CHAPTER IV

MILK UTILS

The consumption pattern of milk by a family and individual consumption per day in liquid forms under different monthly income and dietetic groups were presented in Table 1.

The per capita utilization of milk in all liquid forms increased with the increasing income level and ranged from 76 ml in the income group below Rs.500 upto 206 ml in the income group above Rs.2,000 per month. The per capita utilization of milk in all liquid forms was 210 ml for vegetarian families and 180 ml for non-vegetarian families.

The percentage of the milk purchased by a family utilized as milk itself was found to increase from 11.34 per cent to 18.73 per cent with increase in income level except in the income group of Rs.1501 to 2000 per month where in it was 10.13 per cent. However, it was observed that the highest percentage of milk purchased was consumed as beverages (16.50%) in the same group. It was noticed that the range of utilization of milk as beverages like bougavita, Horlicks etc., range from zero in the income group below Rs.500 to 11.51 per cent in the highest income group.

The highest percentage of milk to the extent of 63.44 per cent was found to be utilized as milk based hot drinks in the income group below Rs.500 per month and the lowest percentage

Table 1. Consumption pattern of milk by a family and individual consumption per day in liquid forms under different monthly income and dietetic groups

Category	Families (1180)			Per capita milk utilization per day in all liquid forms (litres)	Out of milk purchased by a family per day, utilization			
	No.	%	Members		As milk (%)	Beverages (%)	Tea coffee (%)	Fermented milks (%)
INCOME GROUPS (Rs./p.m.)								
Below 500	150	12.51	606	0.076	11.34	-	63.48	25.10
Between 501 and 1000	293	24.43	1371	0.131	13.20	2.08	53.54	31.16
Between 1001 and 1500	294	24.52	1537	0.182	14.61	9.84	33.00	41.80
Between 1501 and 2000	252	21.01	1390	0.237	10.13	16.56	39.30	33.98
Above 2000	210	17.51	1302	0.296	12.73	11.51	30.48	39.27
DIETETIC GROUPS								
Vegetarian	314	26.18	1718	0.219	10.43	15.32	34.90	39.30
Non-Vegetarian	866	73.81	4547	0.180	9.51	6.98	55.12	29.41

of utilisation of milk for hot drinks to the extent of 30.48 per cent was seen in the income group above Rs.2000 per month.

It was also noticed that out of the milk purchased by a family per day, the percentage of milk utilized as milk based hot drinks like tea or coffee etc., was found to be decreasing progressively as the income level increased.

The percentage milk utilization as fermented milks was found to increase with the rise in income levels with the highest percentage of 41.80 in the income group of Rs.1001 to 1500 per month.

The non-vegetarians (meat consumers) were found to be utilizing more milk as milk based hot drinks than vegetarians; whereas the reverse trend was noticed in the percentage utilization of milk as fermented milks; out of the milk purchased by a family per day under the two dietetic groups.

The consumption pattern of milk by a family and individual consumption per day in liquid forms under different family categories of occupational activities and religious faiths were presented in Table 2.

The per capita milk utilization per day in all liquid forms ranged from 110 ml to 229 ml for the occupational categories under Hindu-Faith; whereas the range under Islamic-Faith was found to be 79 ml to 132 ml and that under other-Faiths ranged

Table 2. Consumption pattern of milk by a family and individual consumption per day in liquid forms, under different family categories of occupational activities and religious faiths

Category	Families (1199)			Per capita milk utilization per day in all liquid forms (litres)	Out of the milk purchased by a family per day, utilization (%)			
	Nos.	%	Members		As milk	Beverages	Tea coffee	Fermented milks
<u>OCCUPATIONAL ACTIVITY</u>								
Service	608	58.21	3534	0.219	11.74	19.52	38.83	29.89
Business	191	15.92	1090	0.196	14.40	13.10	31.78	40.70
Manual-work	88	7.33	376	0.110	17.39	1.85	55.92	24.90
<u>RELIGIOUS FAITH</u>								
Service	73	6.08	458	0.132	11.10	12.88	50.62	25.36
Business	29	2.41	199	0.107	9.85	10.82	43.53	35.79
Manual-work	21	1.75	110	0.079	9.51	-	72.84	17.63
<u>OTHER FAITHS</u>								
Service	67	5.58	335	0.180	9.44	6.82	44.43	39.30
Business	14	1.16	79	0.204	18.04	3.07	38.59	40.30
Manual-work	18	1.50	74	0.089	8.33	-	68.09	23.57

from 69 to 204 ml. In general, the per capita milk utilization per day in all liquid forms was found to be decidedly higher in families belonging to service and business categories under Hindu-Faith and Other-Faiths, than in the case of families belonging to the corresponding categories under Islamic-Faith. The per capita milk utilization per day in all liquid forms was highest at 219 ml in service category under Hindu-Faith and lowest at 69 ml in manual-work category under other-Faiths.

It could be observed that out of the milk purchased by a family per day, the percentages of milk utilized as fluid milk were ranging from 11.74 to 17.20 by families belonging to different occupational categories under Hindu-Faith; whereas under the other-Faiths, the range for fluid milk utilization for different occupational categories was found to be 9.44 to 18.04 per cent. It was observed that the occupational categories belonging to Islamic-Faith utilize less milk as fluid milk than the corresponding occupational categories of Hindu-Faith.

Out of the milk purchased by a family per day, the percentage of milk utilized as beverages like Bournvita, Horlicks etc., ranged from 1.85 to 19.82 by families belonging to different occupational categories under Hindu-Faith; whereas under the Islamic-Faith the range was found to be 0.00 to 12.88 and that under the other-Faiths was 0.00 to 6.82. It was observed that the occupational categories belonging to Islamic-Faith and other-Faiths utilize far less milk as beverages than the corresponding occupational categories of Hindu-Faith.

It was observed that 31.78 to 55.90 per cent of the milk purchased by a family was utilised as milk based hot drinks by families belonging to different occupational categories under Hindu-Faith; whereas under the other-Faiths the range for the milk utilised as milk based hot drinks for different occupational categories was found to be 38.70 to 68.09 per cent. It was also observed that the occupational categories under Islamic-Faith utilize more milk as milk based hot drinks than the corresponding occupational categories of Hindu-Faith and other-Faiths.

Out of the milk purchased by a family per day, the percentages of milk utilised as fermented milk were ranging from 34.90 to 40.70 per cent by families belonging to different occupational categories under Hindu-Faith; whereas under the Other-Faiths, the range for fermented milk utilisation for different occupational categories was found to be 23.67 to 40.30 per cent. It was also observed that the occupational categories belonging to Islamic-Faith utilize far less percentages of milk as fermented milk than the corresponding occupational categories of Hindu and Other-Faiths.

Out of the milk purchased, in general, the manual-work category utilize far more percentage of milk as milk based hot drinks and far less percentage of milk as fermented milk and beverages in the occupational categories of all the three Faiths.

Monthly expenditure pattern per family on meat, eggs and milk and per capita monthly, expenditure on milk and milk products under different monthly income and dietetic groups were presented in Table 3.

Out of the monthly expenditure per family on meat, eggs and milk, the percentage of expenditure on milk was found to be higher than the expenditure on meat or on eggs in all the income and in both the dietetic groups. The percentages of expenditure in different income groups ranged from 61.75 to 74.44 for milk, 8.46 to 4.84 for eggs and 29.77 to 19.72 for meat, out of the total monthly expenditure per family on these three items put together. The monthly meat expenditure decreases as the monthly income level increases, whereas the reverse trend was noticed in milk expenditure. The per capita monthly expenditure on milk and milk products was seen increasing as the level of income was increasing, ranging from Rs.8.67 observed in below Rs.500 income level to Rs.35.41 noticed in Rs.2,000 and above income level, per month.

In the case of non-vegetarians, the percentage monthly expenditure on milk out of the total expenditure on meat, eggs and milk was nearly half to the per capita expenditure observed in vegetarians. The per capita monthly expenditure on milk products in non-vegetarian families worked out to be about 75 per cent of the per capita monthly expenditure noticed in vegetarian families.

Table 3. Monthly expenditure pattern per family on meat, eggs and milk and per capita monthly expenditure on milk and milk products under different monthly income and dietetic groups

Category	Families (1199)			Out of monthly expenditure per family on meat, eggs and milk amount for			Per capita monthly expenditure on milk and milk products(Rs.)
	Nos.	%	Members				
				Meat(p)	Eggs(p)	Milk (p)	
<u>INCOME GROUPS</u>							
Below 500	150	12.51	606	29.77	8.46	61.75	8.67
Between 501 and 1000	293	24.43	1371	27.65	7.22	65.12	16.20
Between 1001 and 1500	294	24.52	1537	24.96	6.55	68.48	22.06
Between 1501 and 2000	252	21.01	1399	20.01	5.02	74.96	28.84
Above 2000	210	17.51	1302	19.72	4.84	75.44	35.41
<u>DIETETIC GROUPS</u>							
Vegetarian	314	26.18	1718	-	0.678	98.94	28.78
Non-Vegetarian	885	73.81	4547	35.34	9.28	56.37	21.54

Monthly expenditure pattern per family on meat, eggs and milk and per capita monthly expenditure on milk and milk products, under different family categories of occupational activities and religious faiths were presented in Table 4.

Out of the total monthly expenditure per family on meat, eggs and milk, families belonging to business, service, and manual-work categories under Hindu-Faith were found to spend more on milk than on meat or eggs ranging from 75.64 to 59.79 per cent in the order of service, business and manual-work categories; whereas under Islamic-Faith, the expenditure on milk was found to be comparatively less over the corresponding occupational categories of Hindu-Faith and Other-Faiths ranging from 51.13 to 58.55 per cent.

The families under Hindu-Faith belonging to service, business and manual-work categories were found to spend less on meat than on milk and the expenditure on meat per family was ranging from 18.07 to 31.69 per cent. Under Islamic-Faith and Other-Faiths, the expenditure on meat was found to be more over the meat expenditure of corresponding occupational categories of Hindu-Faith, ranging from 39.16 to 31.97 and 38.30 to 34.06 per cent respectively in the order of service, business and manual-work categories.

In general, the expenditure on milk was found to be more in Hindu-Faith and less in Other-Faiths and very less in .

Table 4. Monthly expenditure pattern of family on meat, eggs and milk and per capita monthly expenditure on milk and milk products under different family categories of occupational activities and religious faiths

Category	Families (1199)			Out of monthly expenditure per family on meat, eggs and milk amount for			Per capita monthly expenditure on milk and milk products (Rs.)
	Nos.	%	Members				
				Meat (Rs.)	Eggs (Rs.)	Milk (Rs.)	
<u>CHRISTIAN</u>							
Service	698	58.21	3534	18.07	6.27	75.64	27.97
Business	191	16.92	1090	25.51	4.35	70.02	29.18
Manual-work	88	7.33	376	33.69	6.51	59.79	15.66
<u>ISLAMIC-ARAB</u>							
Service	73	6.08	468	39.18	9.89	51.13	18.20
Business	29	2.41	199	37.45	11.00	51.54	15.32
Manual-work	21	1.75	110	31.97	9.47	58.55	9.86
<u>DRUID-ARAB</u>							
Service	67	5.58	335	36.30	10.43	52.71	22.55
Business	14	1.16	79	31.85	8.58	59.58	28.47
Manual-work	18	1.50	74	34.06	10.45	55.47	8.36

Islamic-Faith. On the other hand, the expenditure on meat was less under Hindu-Faith and more under Islamic-Faith and Other Faiths.

The business category under Hindu-Faith and Other-Faiths were spending more on milk and milk products on per capita basis than the service category.

The per capita monthly expenditure on milk and milk products was observed to be highest (Rs.29.18) in business category under Hindu-Faith and least (Rs.8.36) in manual-work category under Other-Faiths.

Preference to difference designated milks in various monthly income groups were presented in Table 5.

It was observed that categorically, a majority of the families belonging to different income groups showed preference to cow milk than buffalo milk. On the whole, 59.04 per cent families preferred cow milk, 40.03 per cent preferred buffalo milk and only 0.93 per cent preferred toned milk.

Preference to different milk products under different monthly income groups were presented in Table 6.

The preference for butter milk and curds decreased progressively while the preference for ghee, ice cream and skim milk powder increased gradually as the level of income increased. It was observed that the demand for kulfī and khoa was stable in all the income groups.

Table 5. Preference to different designated milks in various monthly income groups

Category	Families (1199)			Preference (by families)			
	Fos.	%	Members	Buffalo's milk	Cow's milk	Toned milk	Skim milk
MONTHLY GROUP							
Below 500	150	12.51	606	70 (5.83)	80 (6.67)	•	•
Between 501 and 1000	253	24.43	1371	122 (10.17)	170 (14.17)	1 (0.083)	•
Between 1001 and 1500	234	24.52	1587	109 (9.09)	183 (15.23)	2 (0.166)	•
Between 1501 and 2000	210	21.01	1399	98 (8.17)	15 (12.59)	3 (0.250)	•
Above 2000	210	17.51	1302	81 (6.75)	124 (10.34)	8 (0.99)	•
Total				480 (40.03)	708 (59.04)	11 (0.91)	•

Figures in parenthesis indicate the percentages of the total number of families (1199)

Table 6. Preference to different milk products under different monthly income groups

Category	Families	Preference to milk products (by families)							
		Butter milk	Curds	Ghee	Khafi	Skim milk powder (g)	Ice cream	Flavoured milk	Khon La
Below 500	150	25.33	28.00	11.33	2.66	-	10.00	2.66	16.00 4.
Between 501 and 1000	233	12.23	23.99	18.77	3.07	3.41	10.68	6.11	15.69 7.
Between 1001 and 1500	294	10.88	20.40	23.80	3.06	3.06	13.94	5.10	16.66 3.
Between 1501 and 2000	252	6.15	12.30	31.74	3.57	3.57	22.61	1.58	17.85 1.
Above 2000	210	3.33	8.57	29.04	2.38	4.28	31.42	1.90	17.14 1.

The families in the income group between Rs.1801 and 2000 showed the highest preference for ghee and khon.

Per capita monthly expenditure on eggs and meat, milk and milk products under different monthly income and dietetic groups were presented in Table 7.

It was observed that in general, the per capita monthly expenditure increased from Rs.8.67 to Rs.35.41 for milk and milk products and from Rs.4.78 to Rs.17.61 for eggs and meat as the monthly income increased.

Under the dietetic groups, the per capita monthly expenditure on eggs and meat by the non-vegetarians was found to be Rs.15.77 which was less than the amount spent on milk and milk products (Rs.21.56). The per capita monthly expenditure on eggs by vegetarians was Re.0.45 only.

The per capita monthly expenditure on eggs and meat, milk and milk products under different family categories of occupational activities and religious faiths were presented in Table 8.

It was observed that the per capita monthly expenditure on eggs and meat by the families under Hindu-Faith ranged from Rs.12.73 to Rs.5.76 while that under Islamic-Faith ranged from Rs.15.47 to Rs.6.32 and that under other-Faiths ranged from Rs.20.55 to Rs.5.49 in the order of service, business and manual-work categories.

Table 7. Per capita monthly expenditure on eggs and meat, milk and milk products, under different monthly income and dietetic groups

Category	Families (1199)			Eggs and meat (Rs.)	Milk and milk products (Rs.)	Total (Rs.)
	Hos.	%	Members			
<u>INCOME GROUPS (Rs./mo.)</u>						
Below 500	150	12.51	606	4.781	8.67	13.45
Between 501 and 1000	293	24.43	1371	8.754	16.20	24.95
Between 1001 and 1500	294	24.52	1587	11.402	22.06	33.55
Between 1501 and 2000	252	21.01	1300	17.102	28.94	45.94
Above 2000	210	17.51	1302	17.610	36.41	53.02
<u>DIETETIC GROUPS</u>						
Vegetarian	314	26.18	1718	0.452	28.78	29.23
Non-vegetarian	885	73.81	4547	16.775	21.55	38.33

Table 8. Per capita monthly expenditure on eggs and meat, milk and milk products under different family categories of occupational activities and religious faiths

Category	Families (1199)			Eggs and meat (Rs.)	Milk and milk products (Rs.)	Total (Rs.)
	Hos.	%	Members			
<hr/>						
<u>CHRISTIAN</u>			<u>HINDU FAITH</u>			
Service	698	58.21	3534	12.738	27.90	40.70
Business	191	15.92	1090	12.029	29.18	41.20
Manual-work	88	7.33	376	5.762	15.66	21.42
			<u>ISLAMIC FAITH</u>			
Service	73	6.08	468	15.478	16.20	31.67
Business	29	2.41	199	11.104	15.32	26.42
Manual-work	21	1.76	110	6.323	9.86	16.18
			<u>OTHER FAITHS</u>			
Service	67	5.58	336	20.553	22.55	43.10
Business	14	1.16	79	17.694	26.47	44.36
Manual-work	18	1.50	74	5.496	8.36	13.86

The total per capita monthly expenditure on eggs and meat milk and milk products was highest (Rs.44.35) in business category and lowest (Rs.13.85) in manual-work category of Other-Faiths.

The preferences of consumers to various alternatives with respect to source of purchase of milk, willingness to increase the quantity of milk purchased in anticipation of increased incomes and source of animal protein were presented in Table 9.

It was observed that about 38.78 per cent of the families preferred to buy milk from private vendors while 61.21 per cent preferred to buy the milk from the Dairy Development Corporation.

The percentage of the families willing to increase the quantity of milk purchased was 77.06, while 22.93 per cent families felt that the present quantity of milk purchased per day was sufficient to meet their needs.

It was observed that out of the total 1199 families, 61.21 per cent families preferred meat, 33.69 per cent families preferred milk and 5.08 per cent families preferred eggs as their source of animal protein.

The expenditure elasticities of milk and milk products presented in Table 10.

Table 9. Preferences of consumers to various alternatives with respect to source of purchase of milk, willingness to

Category	Total (1199)	
	Families	Percentage
1. SOURCE OF PURCHASE OF MILK		
a) APDDCF	734	61.21
b) Private vendors	465	38.78
2. WILLINGNESS TO INCREASE PURCHASE OF MILK		
a) Yes	921	77.06
b) No	275	22.93
3. SOURCE OF ANNUAL PROTEIN		
a) Eggs	61	5.08
b) Meat	734	61.21
c) Milk	404	33.69

Table 10. Expenditure elasticities of milk and milk products

Category	No. of families	Coefficient in equation (a)	Expenditure elasticity milk and milk products (b)
<u>INCOME GROUPS (Rs./p.m.)</u>			
Below 500	150	0.6939	1.0953
Between 501 and 1000	203	0.8511	0.9148
Between 1001 and 1500	294	0.8661	0.8309
Between 1501 and 2000	252	0.9656	0.7030
Above 2000	210	0.9790	0.6768
<u>RELIGIOUS FAITHS</u>			
Hindu-Faith	977	0.9392	0.8680
Islamic-Faith	123	1.1929	0.4940
Other-Faiths	99	0.9874	0.5889
<u>OCCUPATIONAL ACTIVITIES</u>			
Service	238	0.9826	0.8004
Business	234	1.0090	0.6447
Manual-work	127	0.9803	0.6986
<u>DIETETIC HABITS</u>			
Vegetarian	314	0.9561	1.1310
Non-vegetarian	886	1.0429	0.5000
<u>TOWN-WISE</u>			
Chittoor	318	0.9717	0.7468
Firupati	309	1.0000	0.6596
Cuddapah	301	0.9300	0.8608
Kurnool	271	0.9999	0.6738
Overall	1199	0.72765	0.97683

The expenditure elasticities of milk and milk products ranged from 0.4940 to 1.0953. The expenditure elasticities for different income groups ranged from 1.0953 to 0.6768. The expenditure elasticity for different religious faiths ranged from 0.838 to 0.494. The expenditure elasticities for different occupational activities was greatest (0.8004) for service category and least (0.6447) for business category. It was observed that expenditure elasticity of milk was 1.13 for vegetarians and 0.8000 for non-vegetarians. The expenditure elasticities for different towns ranged from 0.8308 for Cuddalore to 0.6585 for Tirupati. The overall expenditure elasticity for all the four towns was observed to be 0.9768.

The Gini's concentration ratio of expenditure on milk and milk products for different monthly income groups were shown in Table 11.

The inequality aspect of expenditure on milk and milk products for different income groups was found to be 0.259 out of one as indicated by the Gini's concentration ratio. If expenditure on milk and milk products has not indicated inequality in the distribution among different income groups, then Gini's concentration ratio should be '0'. From the table it was observed that there appears low degree of inequality of expenditure on milk and milk products with respect to monthly income based on Gini's concentration ratio.

Table 11. Gini's concentration ratio of expenditure on milk and milk products for different monthly income groups

Income group (Rs./p.m.)	No. of families	Families cumulative	Expenditure per month per family	Cumulative expenditure per month per family	P_i	v_i	$(P_i - P_{i-1})(v_i - v_{i-1})$	
		(p)	(q)	(x)				
Below 500	150	12.51	12.51	7.70	7.70	0.12	0.07	
Between 501 and 1000	283	24.43	35.94	14.57	22.27	0.37	0.22	0.0726
Between 1001 and 1500	204	24.52	61.46	19.84	42.11	0.61	0.42	0.1536
Between 1501 and 2000	252	21.01	82.47	25.98	68.04	0.82	0.68	0.2210
Above 2000	210	17.61	99.98	31.94	99.98	0.99	0.99	0.2839
Total							0.7410	

$$C = 1 - \sum (P_i - P_{i-1})(v_i - v_{i-1}) = 1 - 0.7410 = 0.259$$

C = Concentration ratio

P_i = Cumulative percentage of families for i^{th} income group

v_i = Cumulative percentage of expenditure on milk and milk products per family for i^{th} income group

Gini's concentration ratio for milk and milk products in service, business and manual-work categories and the trend of inequalities in different religious Faiths were shown in Tables 12, 13 and 14 respectively.

The Gini's concentration ratio was 0.7873 for service category and 0.7879 for business category and 0.6668 for manual work category.

Lorenz curve for expenditure on milk and milk products and monthly income and in service, business and manual-work categories were shown in Fig. 1 and 2 respectively.

Table 12. Particulars of Gini's concentration ratio for milk and milk products in service category with different religious faiths

Income group	No. of families	Families (%)	Families cumulative (%)	Expenditure per month per family (\$)	Cumulative expenditure per month per family (\$)	P_i	q_i	$(P_i - P_{i-1})(q_i + q_{i-1})$
Hindu-Faith	668	83.29	83.29	41.92	41.90	0.83	0.42	
Islamic-Faith	73	8.71	92.00	24.28	66.10	0.92	0.66	0.0672
Other-Faiths	67	7.99	99.99	33.79	99.80	0.99	0.99	0.1155
Total								0.2127

$$C = 1 - \sum (P_i - P_{i-1})(q_i + q_{i-1}) = 1 - 0.2127 = 0.7873$$

C = Concentration ratio

P_i = Cumulative percentage of families for i^{th} income group

q_i = Cumulative percentage of expenditure on milk and milk products per family for i^{th} income group.

Table 13. Particulars of Gini's concentration ratio for milk and milk products in business category with different religious faiths

Income group	No. of families	Families (%)	Families cumulative (%)	Expenditure per month per family (\$)	Cumulative expenditure per month per family (\$)	P_1	Q_1	$(P_1 - P_{2-1})(Q_1 - Q_{2-1})$
Hindu-faith	191	81.62	81.62	42.43	42.40	0.82	0.42	
Islamic-faith	29	12.39	94.01	24.11	66.80	0.94	0.86	0.1296
Other-faiths	14	5.98	99.99	33.44	99.80	0.99	0.999	0.0695
Total								0.2121

$$C = 1 - \sum (P_i - P_{i-1})(Q_i - Q_{i-1}) = 1 - 0.2121 = 0.7879$$

C = Concentration ratio

P_1 = Cumulative percentage of families for 1th income group

Q_1 = Cumulative percentage of expenditure on milk and milk products per family for 1th income group.

Table 14. Particulars of Gini's concentration ratio for milk and milk products in manual-work category with different religious faiths

Income group	No. of families	Families (%)	Families cumulative (%)	Expenditure per month per family (%)	Cumulative expenditure per month per family (%)	P_i	q_i	$(P_i P_{i-1})(q_i q_{i-1})$
Hindu-faith	88	69.29	69.29	46.20	46.20	0.69	0.46	
Islamic-faith	21	16.53	85.82	29.10	75.30	0.86	0.75	0.2087
Other-faiths	18	14.17	99.99	24.70	100.00	0.99	1.00	0.2275
Total								0.4332

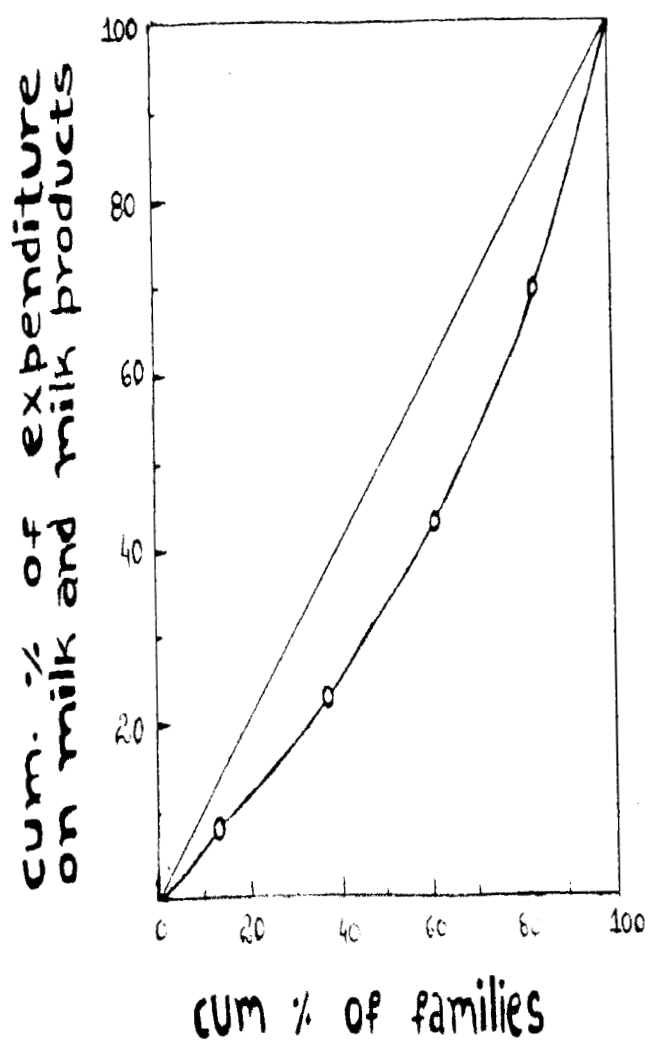
$$C = 1 - \sum (P_i P_{i-1})(q_i q_{i-1}) = 1 - 0.4332 = 0.5668$$

C = Concentration ratio

P_i = Cumulative percentage of families for i^{th} income group

q_i = Cumulative percentage of expenditure on milk and milk products per family for i^{th} income group.

MILK AND MILK PRODUCTS AND MONTHLY INCOME



survey in Madras city.

Results were obtained by Prabhakaran and Patel (1963) from a study of families that belong to incremental income levels. Similar attention is probably due to the high standard of nutrition in families with monthly income. This incremental trend of fluid milk consumption showed an inverse relationship with the magnitude of the magnitude of the milk used as milk based not drinks like tea or beverages and fermented milk seemed to be directly related with the trends in utilization of milk in the form of fluid milk. The group was less than the value obtained by Kaur (1961). Level. The per capita availability of milk in various income groups in all liquid forms increased with an increase in income of the families. The per capita milk utilization per seemed to be directly related with the magnitude of the monthly income in the purchasing power and utilization of milk diet and also limits their purchasing power.

their way of living, forms a baseline for their planning of diets. It has such a hold on people's life that it decides in conditioning the availability and intake of different food nutrients, food habits and attitudes. Income has a major role essential information on nutrient intake levels, sources of study of nutritional status of individuals or groups, providing diet surveys constitute an essential part of any complete

DISCUSSION AND CONCLUSIONS

Meat consumers seemed to be utilising more milk as milk based hot drinks and less milk as fermented milks. Utilization of meat in the families seemed to have a depressing influence on the purchasing trend of milk and per capita utilization of milk in all liquid forms.

In general, the per capita milk utilization in all liquid forms was high in families belonging to service and business categories except in Islamic-Faith who are meat consumers traditionally. The families under Islamic-Faith utilized far more milk as milk based hot drinks and less milk as fermented milks. The percentage utilization of milk as fluid milk was highest in business category of Other-Faiths and the utilization of milk as hot beverages was highest in service category of Hindu-Faith. The high percentage of utilization of milk as milk based hot drinks by the manual-work category could be attributed to their low income levels and consequently low purchase of milk.

In general, the per capita monthly expenditure on milk and milk products increases with the increase in income levels. The percentage expenditure on meat decreased as the monthly income level increased, whereas the reverse trend was noticed in percentage milk expenditure. This indicates that milk and milk products are consumed as essential food items at higher income levels.

The occupational categories under Hindu-Faith were found to spend more on milk than on meat or eggs. This might be due to the presence of more number of vegetarians under the Hindu-Faith.

It was observed that though the per capita utilization of milk was less, the per capita monthly expenditure on milk and milk products was higher in business category than in service category of Hindu-Faith and other-Faiths. The reason for this could be that most business families preferred to buy their milk from private vendors at a higher price than Andhra Pradesh Dairy Development Co-operative Federation (APDDCF).

In general, the per capita monthly expenditure on milk and milk products was far higher than the per capita monthly expenditure on eggs and meat in both the income and dietetic categories. On the whole, all the occupational categories under Hindu-Faith and Other-Faiths spent more on eggs and meat, milk and milk products than the corresponding categories of Islamic-Faith. This could be due to the large family size normally observed in muslim families and consequently, low per capita total expenditure.

It was observed that a large proportion of the families under survey study preferred cow milk to buffalo milk and toned milk. The preference to cow milk could be attributed to the availability and popularity of cow milk in the Rayalaseema

region, particularly in Chittoor District. It was observed that a majority of the elderly people preferred cow milk because of its low fat content. Similar results were reported by Sawayama *et al.* (1980) in Philippines. The poor preference to toned milk could be due to peculiar smell, frequent curdling and poor quality as reported by the consumers. Similarly 65 per cent of house-holds rated the quality of dairy milk as average indicating the need to improve quality as reported by Thamrajakshi (1973) in Madras city.

The preference to butter milk and curds decreased with increasing income levels while the reverse trend was observed for ghee and ice cream. The capacity to spend more on ghee and ice cream manifests itself in the higher preferences for ghee and ice cream in the higher income groups. The relatively high and stable demand, for khos in all the income groups indicates the popularity and marketability of khos in the Rayalaseema region. It was observed during the survey that Kulfi and Lassi were preferred mostly by non-vegetarian families and butter milk and curds were preferred mostly by vegetarian families.

It was observed that a significant percentage (38.78) of families preferred to buy milk from private vendors indicating the necessity to improve distribution, quality and price structure of milk. Similarly, a vast majority (77%) preferred to increase their purchase of milk projecting the vast demand

for milk in the future. Some of the non-vegetarian families preferred milk to meat and eggs demonstrating the significance of the milk in Indian diet.

The range of 0.494 to 1.095 observed for expenditure elasticities for milk and milk products indicates that for one per cent increase in per capita total expenditure per month, the range of increase on per capita expenditure on milk and milk products would be from 0.49 to 1.09 per cent. The elasticity estimates represent the responsiveness of consumers to changes in income with regard to the expenditure on milk. The elasticity represents long term policy implications to the developmental efforts to attain better living standards for the population.

The expenditure elasticities tended to decrease with an increase in income level indicating that the per capita expenditure on milk and milk products decreased with an increase in per capita total expenditure per month. This implied that at higher income levels, milk and milk products were consumed as necessary food items. It was observed that expenditure elasticity was more than unity in the lowest income group. Similar results were obtained by Singh *et al.* (1978). The expenditure elasticity was high for service families indicating the greatest inequalities in milk consumption in service families than business and manual-work families as was also reported by Patel *et al.* (1975).

It was observed that there was low degree of inequality of expenditure on milk and milk products with respect to month income groups based on Gini's concentration. The Gini's concentration values of 0.7873 for service category and 0.7879 for business category indicate a high degree of inequality of the expenditure on milk and milk products.

CHAPTER VI

SUMMARY

The consumption pattern of milk and milk products and consumers preferences by way of conventional survey was made during January, February and March, 1966 in Chittoor, Tirupati, Cuddapah and Kurnool towns of Rayalaseema region among different monthly income groups, dietary categories, family categories of various occupational activities under different religious faith. A total number of 1199 families selected at random were interviewed and the data were collected using a questionnaire structured for the purpose.

The per capita milk utilization per day in all liquid form was found to be increasing with the increase in the income level of the families from 76 to 296 ml. Milk utilization as fluid milk as well as fermented milk was found to be increasing with the increase in the income level of the families. Milk utilization as beverages like Bournvita or Horlicks was high in the higher income groups. The percentage of milk utilized as milk based hot drinks like tea or coffee was found to be decreasing progressively with the increase in income level from 63.48 to 30.48 per cent.

The per capita milk utilization per day in all liquid forms by the vegetarians was found to be more than in the case of non-vegetarians (meat consumers). The non-vegetarians were

found to be utilizing more milk as milk based hot drinks than vegetarians whereas the reverse trend was noticed in the percentage utilization of milk as fermented milks and beverages.

The per capita milk utilization per day in all the liquid forms was found to be decidedly higher in families belonging to service and business categories under Hindu-Faith and Other-Faiths than in the case of families belonging to the corresponding categories under Islamic-Faith. The occupational categories under Islamic-Faith were found to utilize less milk as fluid milk than the corresponding occupational categories of Hindu-Faith. The occupational categories under Islamic-Faith and other-Faiths were observed to utilize far less milk as beverages than the corresponding occupational categories of Hindu-Faith. The occupational categories under Islamic-Faith were found to utilize more milk as milk based hot drinks than the corresponding occupational categories of Hindu-Faith and Other-Faiths while the reverse trend was noticed in the utilization of milk as fermented milk. The manual-work category were observed to utilize far more percentage of milk as milk based hot drinks and far less percentage of milk as fermented milk and beverages than the service and business categories of all the religious faiths.

The monthly expenditure on milk per family was found to be decidedly higher than the expenditure on meat or on eggs, in all the income groups and in both the dietetic groups.

The percentage monthly meat expenditure decreased as the monthly income level increased, while the reverse trend was noticed in the percentage monthly milk expenditure. The per capita monthly expenditure on milk and milk products was seen increasing as the level of income was increasing from Rs.8.67 to Rs.35.41. In the case of non-vegetarians, the percentage monthly expenditure on milk was nearly half and the per capita monthly expenditure on milk and milk products was about 75 per cent of the corresponding values observed in vegetarian families.

The occupational categories under Hindu-Faith were found to spend more on milk than on meat or eggs. The monthly expenditure on meat per family in all the occupational categories under Islamic-Faith and Other-faiths was found to be more over the corresponding occupational categories under Hindu-Faith while the reverse trend was noticed in the monthly expenditure on milk.

The per capita monthly expenditure on milk and milk products was found to be more in Hindu-Faith and less in other-Faiths and very less in Islamic-Faith. The per capita monthly expenditure of business category under Hindu-Faith and Other-Faiths was more than the service category. The business and service categories of Islamic-Faith appear to be almost identical in monthly expenditure per family as well as in per capita monthly expenditure on milk and milk products.

A majority of the families under different income groups showed preference to cow milk than buffalo milk. Only a negligible per cent of the families preferred toned milk.

As the income level was found increasing, the preference to butter milk and curds was found to be decreasing whereas the preference to ghee, ice cream and skim milk powder was found to be increasing. It was observed that the demand for kulfi and khos was stable in all the income groups at 3 per cent and 16 per cent respectively.

The per capita monthly expenditure on milk and milk products was found to be far higher than the per capita monthly expenditure on eggs and meat, in both the income and dietetic categories. Under different income groups, the per capita monthly expenditure on milk and milk products and on eggs and meat was found to be increasing as the income level was increasing from Rs.13.45 to Rs.53.02.

The per capita monthly expenditure on milk and milk products was far higher in service and business category in Hindu-Faith over the per capita monthly expenditure on eggs and meat. In general, the total expenditure on eggs and meat, milk and milk products by the occupational categories under Islamic-Faith was far less than the total expenditure by the corresponding categories under Hindu-Faith and Other-Faiths, except in manual-work category. The business category under

Hindu-Faith and other-Faiths spent more than the service category on eggs and meat, milk and milk products put together.

It was observed that a majority of the families preferred to buy the milk from APDCGF although purchases from private vendors were significant at about 38.78 per cent.

A vast majority of the families expressed their willingness to increase their future purchases of milk.

It was observed that a majority of the consumers preferred meat although a considerable proportion of consumers preferred milk as a source of animal protein in the diet.

The study revealed that a one per cent increase in the monthly expenditure among different income groups would increase the expenditure on milk and milk products from 0.67 per cent to 1.09 per cent. The expenditure elasticities on milk and milk products decrease with the increase in income levels. The per capita expenditure on milk and milk products decreases with the increase in per capita total expenditure per month indicating that at higher income levels, milk and milk products are consumed as necessary food items. The Gini's concentration values for service and business categories indicate a high degree of inequality in the expenditure on milk and milk products.

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