

A Study on Socio-Economic Conditions of Members and their Attitude towards the Performance of Dairy Co-Operatives in Tamil Nadu, India

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Abstract

Today, if India has emerged as the largest producer of milk in the world, it is due to the untiring efforts of millions of rural milk producers across the country. India is the world's single largest milk country accounting for around 15 per cent of the world milk production. It ranks first in Buffalo milk production (66 per cent of the world's milk production). Milk and milk products are a major source of cheap and nutritious food to millions of people in India and the only acceptable source of animal protein for a large vegetarian segment of Indian population. Dairying provides livelihood to millions of small and marginal farmers. It also provides the main source of income next to agriculture. This study will be helpful to know about the socio-economic conditions of the members, especially in the areas of income, employment, and profit through dairy co-operatives. The Government should also take necessary steps to reserve adequate acreage of suitable land for raising fodder, in order to arrest the rise in prices. It is suggested that banks should give more loans and subsidies to the people who are involving in dairy activities especially for the purchase of milch animals.

Keywords: Dairy co-operatives; Milk; Chi-Square test; Garret raking method; Socio-economic

Introduction

A substantial number of agriculturists in India rely on upon creature cultivation for their job. Notwithstanding supplying milk, meat, eggs, wool and shrouds, creatures, predominantly bullocks are the significant wellspring of force for both agriculturists and dryers. In this way, creature cultivation assumes an imperative part in the country economy.

Milk is defined as the fluid secreted by female mammals for nourishment of their young ones. Dairyman milk is defined by the Prevention of Food Adulteration Act as "Milk is the secretion derived from complete milking of healthy milch animals, excluding the milk derive during the first week after calving (Colostrum)" [1]. "In India, 52 per cent of the milk is produced by buffaloes, 45 per cent by cows and only 3 per cent of the milk is contributed by other species namely Goat, sheet etc" [2].

Today, if India has emerged as the largest producer of milk in the world, it is due to the untiring efforts of millions of rural milk producers across the country who with their sweat and toil have earned, living with the support of the institutional structure provided by 1,00,000 dairy cooperatives throughout the country. The farmers' sense of ownership of the cooperative and its brands have been the single biggest ingredient in their unique success against all odds.

In India milk production continues to be a small farm activity. Most of our rural milk producers are small marginal farmers and landless labourers and many of them are women. They have one or two heads of milch animals. The milch animals are fed with agricultural wastes and crop residues despite its subsistent nature. India has emerged as the largest producer of milk in the world surpassing the US and the European countries. Our rural milk producers have transformed dairying in India. They have proved that the given command over the resources they create, they can and will produce miracles [3].

The earliest attempt for dairy development in India can be traced back to British rule when the defense department established military dairy farms to ensure the supply of milk and butter to the colonial army.

The first of these farms was set up in Allahabad in 1913; subsequent facilities were established at Bangalore, Ootacamund and Karnal. Further to some extent the Second World War gave impetus to private dairies with modernized processing facilities [4].

India is the world's single largest milk country accounting for around 15 per cent of the world milk production. It ranks first in Buffalo milk production (66 per cent of the world's milk production). This sector has now emerged as an important income generator and major contributor to the gross output of the agricultural sector. Dairying is considered as a very important subsidiary occupation, which provides employment to the millions of unemployed and underemployed villagers. It is very significant to note that the dairy co-operation and operation flood proposed by NDDDB restructured the milk production in India and its growth. Milk production grew at more than double, the rate of growth of the population thereby increases the per capital availability of milk from 112 gms/day in 1970-71 to 226 gms/day in 2001-2002 [5].

India is predominantly an agrarian economy with more than 75 per cent of the population in villages, depending on agricultural, animal husbandry and allied activities for their livelihood. Among many livestock enterprise, dairying is the most ancient occupation established in the rural setting of our country. Dairy sector contributes significantly in generating employment opportunities and supplementing the income of small and marginal farmers and landless labourers of rural India, besides providing food security [6].

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For sheer numbers, India's dairying has no match in the world. The figures are simply mind boggling. For example, some 70 million farmers, maintaining a milch herd of a little under 100 million – 57 million cows and 29 million buffaloes fed largely on crop residues having the milk yield estimated at 71 million tonnes in 1996. Starting as a trickle of one to two liters per family in some 5,00,000 remote villages, a unique collection system transforms this feeble flow into a veritable flood of 100 million litres for urban Indian consumers every day [7].

Significance of the Study

India has already achieved the distinction of top position in milk production in the world and with 4.5 per cent current annual growth rate in milk production.

The Indian Dairy sector represents excellent prospects for strengthening rural economy particularly for small, marginal farmers and rural poor. Dairy farming based agricultural systems would lead to organic farming, which would result in sustainable agricultural systems with better quality products and more returns under the new global scenario. Dairying needs to receive policy support from the government as an instrument for bringing about socio-economic transformations in the rural sector. For integrated rural development focused on dairying every state/region need to evolve an approach involving farmers and developmental agencies in a participatory mode.

Dairy development has inbuilt advantage of the 'environmental friendly' approach towards rural prosperity. Recycling of crop residues for feeding of animals ensures returning of soil nutrients. This approach is also synergistic towards the concept of 'organic farming'. This provides unique opportunities for the 'value addition' to the farm produce.

Keeping in view of the present scenario of glut in food grains, expensive storage, issues of providing support price and pressures of the global market, diversification of agriculture is crucial for the sustainability of the Indian agriculture. Diversification in agriculture through Dairying and allied aspects such as, Organic farming and clean milk production at village level is inevitable for employment generation and overall rural development [8].

Statement of the Problem

Milk and milk products are a major source of cheap and nutritious food to millions of people in India and the only acceptable source of animal protein for a large vegetarian segment of Indian population. Dairying provides livelihood to millions of small and marginal farmers. It also provides the main source of income next to agriculture.

Dairy industry is crucial importance to India. It generates regular income not only to the rural but also to the urban and semi-urban population, especially to womenfolk by providing self-employment opportunity and thereby improving their life. In a tropical country like India, agriculture may fail sometimes, due to monsoon failure but dairying never fails and it gives regular and steady income [9].

Through changes in government policy, the number of privately owned plants has increased substantially. The effect of these changes upon the performance of this sector has not been carefully assessed yet. Milk is perishable commodity and seasonal production. It cannot be stored in its raw form. Hence, processing and product transformation are crucial sectors in this industry.

An attempt has been made for the present study to identify the main reasons affecting the performance of dairy co-operative and its union and members' utilization pattern.

Review of Previous Studies

Rao in his study, "Farmers Benefit from a Modern Milk Cooperative Society", he has examined the prospects of increasing income and employment on small and marginal farms through Milk Cooperative Society. He summarized that the percentage contribution made to total farm income and employment by livestock production was higher on marginal and small farms as compared to large farms [10].

Subburaj in his study, "Production and Sale of Dairy Products in Trichy District Co-operative Milk Producers' Union, Tamil Nadu – A Break-Even Analysis", he concluded that the union is yet to fully utilize the plant capacity and as the union has the best hope of business prosperity, it is the right-time to take up programs for diversified product promotion such as ghee, butter, cheese, cream etc., which will not only supplement its business profitability but also open new avenues for milk production and marketing [11].

Joshi et al. in their article, "Economic Appraisal of Dairy Cooperative Union in Arid Region of Rajasthan", they concluded that the management of milk collection, procurement, processing, marketing and other similar activities for milk and milk products under cooperative structure would be an economic viable proposition. Further they added that with the help of better grazing, breeding and watering programs for livestock, better management of plant and lesser wastage, the milk and milk products will continue to retain its economic edge over other similar enterprises [12].

Singh and Verma in their paper, "Fluctuating in Milk Availability and Its Impact on Procurement Cost", they attempted to (i) study the fluctuations in milk availability and estimate the cost of milk procurement and (ii) establish cost-volume relationship and analyse the sources of scale effect in milk procurement. They remarked that the milk union procured 1, 15, 32,359 kg. Of milk during the co-operative year 1987-88. Cow milk accounted for 17.61 per cent of total milk supply, the rest being buffalo milk significant variations in milk procurement and corresponding costs during different months were observed [13].

Singh and Rai in their study, "Economics of Production and Marketing of Buffalo Milk in Haryana", he concluded that the feed and fodder maintenance cost accounting for 58 to 68 per cent of the total cost in dry zone and 52 to 67 per cent in wet zone. He further added that the establishment of milk co-operative societies in the rural areas had positive impact on the market for surplus of milk [14].

Kakade and Bagade in their study, "Profit and Loss of Dairy Industry : A Case Study of Malshiras Taluka", they concluded that per cow per day a large farmers' milk production cost is very high due to high investment on cattle and cattle shade and higher expenditure of feed, fodder, concentrates and more dependency on labour. Further they added that on the other hand less milk producers' milk production cost is very less due to personal attention and less investment in cattle and cattle shade, less expenditure on feed and fodder and concentrates. They also stated that the dairying provided more employment to the youngsters 56 milk producers belong 31 to 45 age group among 100 milk producers and there are only 13 per cent illiteracy among 100 milk producers [15].

Muruganandan in his study, "Performance Appraisal of Thatchur Milk Producers' Co-operative Society", he suggested that i) the society can include more villagers in the district to enroll membership, so that more villages will be benefited, ii) the society should make all necessary steps to purchase and supply high yielding varieties of milch animals,

iii) in order to benefit the local population, the society can start a few retail sales outlets, this will help to increase the profit of the society, iv) the society has to conduct awareness camp on milk production in order to benefit the local people, and v) the collected waste dung is utilized as manure and fuel by the members. The society has to take steps to educate the members to produce gas for cooking and good natural manure for their plants [16].

Kannan in his Ph.D. thesis, "A Study on Performance of Dairy Farming and its Correlates in Madurai District", he concluded that the increase in level of education, family income and their personality traits has a cumulative impact on the performance of dairying and he suggested that the level of education among the owners can be enriched with the help of some basic education programmes. The importance of family income should be taught among the owners of the farms [17].

Verma in his study, "Working Capital Management in GCMMF Vis-A-Vis Dairy Industry", observed that there were GCMMF is able to have a better turnover of its current assets as compared to the companies in the industry. However, this turnover is partially due to the lower investment in its current assets as reflected by a lower current ratio for GCMMF. Therefore, it is to be viewed whether this lower inventory and its higher turnover may not be at the risk of the customers not being able to get the product at the milk parlors and thereby a subsequent loss in revenue for GCMMF. Further, he added that one significant variation between GCMMF and the industry is credit period extended and obtained. Industry is obtaining and extending a much higher credit period. GCMMF ultimately operates through its primary credit cooperative societies and therefore it needs to make payments to its farmer members promptly. However, given the competitive scenario GCMMF needs to seriously revise its credit policies so as to maintain the competitive edge and also to serve the interest of poor milk producer farmers [18].

Kolte in his article, "Women Empowerment – A Study of Hirkani Women's Multi State Dairy Co-operative", he attempted to study about Hirkani Mahila Sahakari Dudh Utpadak Society Ltd., and he found that at present there are 152 members are in the Hirkani Mahila Sahakari Dudh Utpadak Society Ltd. It is totally run by women organization and all the posts of office bearers are all held by women members. Further he added that the Hirkani Mahila Sahakari Dudh Utpadak Society Ltd., has many future plans like : i) Scientific training for cattle farming, ii) Management of Collection Centres, iii) Training women to use automated devices for grades, fat, degree and iv) Computerized billing system etc. [19].

Scope of the Study

This study will be helpful to know about the socio-economic conditions of the members, especially in the areas of income, employment, and profit through dairy co-operatives. This study analyses the production and marketing of milk through dairy cooperatives. This study specially focused on benefit of cooperative among its co-operative members, member's knowledge about dairy co-operatives, problems of beneficiaries and suggestion of dairy co-operative for good performance and dairy co-operative beneficiaries for better economic status.

Objectives of the Study

The present study has the following as its specific objectives:

1. To analyse the Socio-economic conditions of the members of Dairy Co-operatives in the study area.

2. To offer suitable suggestion for the development of Dairy co-operatives based on the findings of the study.

Hypotheses

Considering the above objectives, the following null hypotheses were formulated for testing:

1. Sex is independent from the level of attitude of the members.
2. Age is independent from the level of attitude of the members.
3. The level of attitude is independent of the marital status.
4. There exists no relationship between educational qualification and level of attitude.
5. There exists no relationship between the family size and the level of attitude.
6. There exists no relationship between the nature of the family and the level of attitude.
7. The level of attitude is independent of the income.

Limitations of the Study

Every research suffers from limitations. Some of these are inherent in the research design while some others become part of the study during various stages of operation. The present study is subjected to the following constraints and limitations. There is always a general limitation on the sample survey. The conclusion reached from this study, therefore, cannot be applied with certainty to all dairy cooperative members and at all times. The performance of dairy co-operatives itself is very wide and extends not only to the members but also to consumer and employees of dairy cooperatives. But this study is confined to the dairy cooperative members alone, which, in deed, is one of the major limitations. While answering to the schedule many rural illiterate dairy members gave the information from their memory, that they do not have the habit of keeping records of the dairying activities. So we cannot prove they are hundred percent reliable.

This limitation of the study has in no way affected the accuracy of the data and consequently it has no adverse impact on the validity of the research findings or conclusions derived there from.

Period of Study

The research study covers eleven financial years from 2012-2013.

Methodology

The present study has been carried out on the basis of data and information generated from both primary and secondary sources.

Primary data

In order to have an in-depth study of the research problem the first hand information was obtained from the members of the Dairy Co-operatives as well as from officials of the Dairy Co-operatives in the study area using separate interview schedules framed for the purpose. The primary data were generated by sampling method.

The sampling survey helped to generate all relevant data and information from the members of Dairy Co-operatives and Officials of Dairy Co-operatives in the study area.

Interview Schedule: Two interview schedules were used to collect information and data from the officials and members of the dairy

co-operatives. The researcher himself conducted the interviews. The interview schedules in their preliminary forms, were pre-tested twice each in their respective field and they were finalized after incorporating all necessary changes in the content and design thereof as warranted by the pre-tests. It was prepared in English but whenever necessary the questions in the interview schedule were translated orally into Tamil (local language) to make them comprehensible to the respondents.

The first interview schedule was designed for the secretaries of Dairy Co-operatives. The second one, designed for the members of Dairy Co-operatives which took more than 20 minutes per interview. All the respondents gave all the required information and they were very co-operative.

The completed schedules were checked and edited immediately to ensure completeness and correctness. The researcher rectified the omissions and commissions in the schedules then and there by discussion with the respondents. Thus, the information gathered was tabulated properly for the purpose of analysis. This research follows both 'positional' and 'behavioral' approaches. The study is essentially analytical in nature. The primary data collected through procedure described above were marshaled objectively in order to draw meaningful conclusions.

Secondary data

The data relating to the Dairy Co-operatives were collected from various published sources like standard textbooks, journals, magazines, Web Pages, Periodicals and News Papers.

Analytical Tools

The data collected from different sources were processed according to the objectives laid down for the study. The collected data were first transformed manually to a master table which formed a convenient all-time reference for all further tabulations.

The data were analyzed by using different statistical techniques like Chi-Square Test, Garret Raking Method and Mann-Whitney U-Test were used for the purpose of this study.

Percentage analysis has been extensively used in the process of analysis and interpretation of data.

Background of the Members

This section furnishes a detailed report on the analysis of the socio-economic background of the dairy co-operative members in Tamilnadu. It includes the factors, sex, age, education, community, marital status, annual income, family status and family size.

Gender-wise distribution

Sex is one of the important profile variables of the members. It has its own impact on their expectation and perception on the performance of dairy co-operatives. Hence, the present study includes the gender as one of the important socio-economic variables. The gender-wise classification of the members is shown in the Table 1.

Sl. No.	Sex	Number of Members	Percentage
1.	Male	260	65.00
2.	Female	140	35.00
	Total	400	100.00

Table 1: Gender-wise distribution.

Sl. No.	Age (in years)	Number of Members	Percentage
1.	Below 21	85	21.25
2.	21-30	88	22.00
3.	31-40	93	23.25
4.	41-50	73	18.25
5.	Above 50	61	15.25
	Total	400	100.00

Table 2: Age-wise classification.

Sl. No.	Marital Status	Number of Members	Percentage
1.	Married	253	63.25
2.	Unmarried	105	26.25
3.	Widows/Widowers	42	10.50
	Total	400	100.00

Table 3: Marital status of the members.

Sl. No.	Educational Qualification	Number of Members	Percentage
1.	Primary	80	20.00
2.	Secondary	78	19.50
3.	Higher secondary	89	22.25
4.	Graduates	89	22.25
5.	Illiterate	64	16.00
	Total	400	100.00

Table 4: Educational status of the members.

Source: Primary data.

Out of the 400 members, 260 (65.00 per cent) are males whereas the remaining 140 members (35.00 per cent) are females. It can be concluded that the males are interested in the activities in dairy farming than females.

Age-wise classification

Since the age of members is one of the important segments in their life, it is included in the present study. The age of the members is the completed age at the time of collecting data. In the present study, the age of the members is classified into below 21 years, 21 to 30 years, 31 to 40 years, 41 to 50 years and above 50 years. The age-wise classification of the members is presented in the Table 2.

The important age groups of the members are 31 to 40 years and 21 to 30 years. They constitute 23.25 and 22.00 per cent to the total respectively. The members who are below 21 years constitute 21.25 per cent. It is followed by the age group of 41-50 years and above 50 years.

Marital status

The marital status is classified into married, unmarried and widows/widowers. The marital status of the members is shown in the Table 3.

Source: Primary data.

The majority of the members are married. They constitute 63.25 per cent out of the total members. It is followed by unmarried members and widows/widowers, which constitute 26.25 per cent and 10.50 per cent respectively. The analysis reveals that the married members have availed the services rendered by the dairy co-operatives.

Educational status

The level of education represents the level of formal education completed by the members at the time of collecting the data. Since the level of education provides an awareness of the dairy farming,

the highly educated members may compare the services offered by the dairy co-operatives with those of others. The level of education may increase the level of expectation and also determine the level of attitude with the functioning of dairy co-operatives. In the present study, the level of education is classified as primary, secondary, higher secondary, graduates and illiterate. The Table 4 presents details about the educational status of the members (Table 4).

Source: Primary data

The Table 4 illustrates the level of education among the members. The important levels of education are higher secondary and graduation which constitute 22.25 per cent each. It is followed by primary, secondary and illiterate which constitute 20.00 per cent, 19.50 per cent and 16.00 per cent respectively. The analysis reveals that the members with higher secondary education and graduate education have availed the services rendered by the dairy co-operatives.

Income-wise distribution

The annual income of the members represents the income earned by the members from all possible and available sources during a year. Since the income of the members has its own impact on expectation, family requirement and perception of various aspects of life, it is included as one of the socio-economic variables. The income of the members is classified into: Below Rs.25,000, Rs.25,000 to 50,000, Rs.50,000 to 75,000, Rs.75,000 to 1,00,000 and above Rs.1,00,000. The distribution of members according to their annual income is presented in the Table 5.

Source: Primary data.

The important annual income groups among the members in the present study are Rs. 25,000 to 50,000 and Rs. 50,000 to 75,000, which constitute 26.50 and 24.25 per cent to the total, respectively. The members who belong to the annual income group of Rs.75,000 to 1,00,000 constitute 23.25 per cent. It is followed by the annual income group of above Rs. 1,00,000 and below Rs.25,000 which constitute 13.00 per cent each respectively.

Distribution of members according to their nature of family

The nature of family represents the type of family pattern of the members. In the Indian set up, the traditional family systems are joint family system and nuclear family system. In the joint family system, the members live along with their parents, brothers, sisters and their children as one family. In the nuclear family system, the members' family live alone. The members belonging to joint family and nuclear family systems in the present study are shown in the Table 6.

Source: Primary data.

In total, 71.75 per cent of the members belong to the nuclear family system, and the remaining 28.25 per cent of the members belong to the joint family system. The analysis reveals that the nuclear family system is the dominant system among the members in the study area.

Sl. No.	Annual Income (in Rs.)	Number of Members	Percentage
1.	Below 25,000	52	13.00
2.	25,000 – 50,000	106	26.50
3.	50,000 – 75,000	97	24.25
4.	75,000 – 1,00,000	93	23.25
5.	Above 1,00,000	52	13.00
Total		400	100.00

Table 5: Income-wise distribution of the members.

Sl. No.	Nature of Family	Number of Members	Percentage
1.	Joint family	113	28.25
2.	Nuclear family	287	71.75
Total		400	100.00

Table 6: Classification of the members according to their nature of family.

Sl. No.	Category	Number of Members	Percentage
1.	Below 3	100	25.00
2.	3 – 6	205	51.25
3.	Above 6	95	23.75
Total		400	100.00

Table 7: Size of the family-wise distribution of the members.

Distribution of members according to their family size

The family size represents the number of family members living along with the members in their respective families. The family size is one of the important factors that determine the standard of living of the members. The family size in the present study is confined to below 3, 3 to 6, above 6 members. The distribution of the members according to their family size is presented in the Table 7.

Source: Primary data.

The majority of the members' households have the family size of 3-6 members. It constitutes 51.25 per cent and it was followed by below 3 members and above 6 members respectively which constitute 25.00 per cent and 23.75 per cent.

Cost and Return Structure

The cost of milk production is classified into variable cost and fixed cost. The variable cost consists of feed cost and labour cost. The feed cost consists of the cost of green fodder, dry fodder and concentrates while labour cost includes the cost of hired labour and imputed family labour. The fixed cost includes depreciation on cattle shed and dairy equipment's, depreciation on animals, and interest on fixed capital.

Cost Components-The measurements of cost components used for the present study are discussed below:

Feed Cost

Feed cost is the summation of the cost of green fodder, dry fodder and concentrates.

Green fodder: Green fodder includes the sugarcane tops, grass and other leaves. The cost of these varies according to place and time. The members used only the cheapest available. In urban areas, the members pay for it but in rural areas, the seldom pay and even where the payment is made, it is very low. But, the study has included the opportunity cost of these items also. The costs in rupees given by the members have been taken into consideration. The study takes only average cost of the green fodder used.

Dry fodder: By dry fodder is meant the paddy straw. Paddy straw may be purchased for a price which varies. The study takes into account the approximate value of paddy straw used to feed the animals, and the information given in this regard by the members has been taken into consideration to arrive at the average cost.

Concentrates: Concentrates include sarson cake, grams and cotton seeds, feed and feed mixture, groundnut cake, and rice bran and cotton seed cake. These are generally purchased from the market. The members use any one or combination of any two or three types to feed

animals. These are purchased either daily or once a week or once in a month. The cost of the concentrates is measured from the information given by the members. Even though some variations are found in the value of concentrates as given by the members, only the average cost is taken into consideration.

Labour cost

The labour cost includes the payment made to family labour or hired labour for discharging duties like feeding and watering, washing and cleaning, milking, exercising, transporting grass from the field to the household and the time spent for providing veterinary care to animals. These services are calculated on the basis of time spent on them as child, female and male labour. Eight hours spent are taken as one manday and on the basis of the wages paid to the male, female and child labour at the rate of 3 child = 2 female = 1 male are taken into account [20]. The prevailing wage rates for male and female are 80 and 50 rupees respectively in the study areas. Using the above formula, the total Mondays spent on each activity are calculated, especially during the lactation period. In the dry period, the Mondays spent on maintaining cows are calculated without any break-up details because the members spend only a meager time. The total Mondays are calculated finally.

Family labour: The Mondays spent on maintaining the cows in lactation and dry periods are calculated even for family labour. The prevailing wage rate for the permanent labour is used to find the value for the family labour.

Hired labour: The actual rate paid to hired labour is taken into account for the present study.

Miscellaneous expenditure: The miscellaneous expenditure covers the veterinary charges which include the charges for artificial insemination, cost of medicine, and honorarium for the dispensary staff, purchase of ropes, repairs carried out to cattle shed and equipment's used for milking cows and lighting charges. These expenditure details have been got from the members, with regard to lactation and dry periods for the cows. Only the average is taken into account.

Fixed cost

Fixed cost includes depreciation on cattle shed and dairy equipment's, on cows and interest on fixed capital (purchase price of the cows).

Depreciation on cattle shed and dairy equipment's: The cattle shed requires an area of 50 sq. ft. per cow or buffalo. The value of which can be calculated with the help of the market rate per sq. ft. This value varies from place to place. The sheds are classified into pucca shed and Kutcha-shed. The depreciation on pucca-sheds and Kutcha-sheds are 2 per cent and 5 per cent respectively. The depreciation on dairy equipment's like baskets, ropes and nails are calculated at 5 per cent. These two depreciations are added to arrive at the total.

Depreciation on cows: For the calculation of depreciation on cows, the cows are graded according to the stages of lactation, that is, from one to seven lactation periods. The cows which are in I, II and III lactations are not subjected to depreciation [21]. In IV, V, VI, and VII lactation periods, cows are subjected to 2.5 per cent rate of depreciation on the market value.

Interest on fixed capital: The interest on fixed capital is calculated on the purchase price of the cows, which is dependent on the type and age of the cows, including the stage of lactation. The interest on that

value is calculated at the rate of 11.5 per cent which is the common rate of interest charged by the commercial banks for agricultural finance.

Another component of the interest on fixed capital is interest on working capital. The producers of milk have to wait for getting their payment against milk pooled to societies or to any middleman from 7 days to 15 days. But in the direct sale to consumers, they get the payment immediately. The interest on working capital is calculated at the rate of 11.5 per cent but only for an average of 8 days irrespective of whether it is sold to consumers, vendors or societies.

Total fixed cost

The total fixed cost is the sum of depreciation on cattle shed, dairy equipments, depreciation on cows and interest on fixed capital.

Total Cost

Total cost consists of the total variable cost and fixed cost.

Income from Dung

Dung is sold as a commodity for various purposes. The value of dung is estimated on the basis of information given by the members.

Net cost of Milk Production

It is calculated by subtracting the income from dung from the total cost of milk production.

Average Cost of Milk Per Litre

The average net cost of milk production is divided by the average milk production to get the average cost of milk per litre.

Average Cost of Milk Production.

The average cost of milk production is worked out. These costs are calculated for both the lactation period and those including the dry period. The average cost of production of milk is given in the table 8.

The Table 8 shows that the variable costs constitute 82.73 per cent of total cost during the lactation period and 83.32 per cent during the including dry period. The feed cost percentage is 58.65 per cent in the lactation period while it is 59.77 per cent in the inclusion of dry period. But there is no significant variation in the proportion of variable cost to the total cost between the two periods. Hence, the total fixed and variable costs have been increasing in the same proportion among the two periods.

Labour cost is the second major cost, which comes under the variable cost. The labour cost was worked out at 22.34 per cent and 21.82 per cent of the respective total costs for two periods.

Among the labour cost, the family labour dominates with 14.18 per cent and 13.72 per cent in the inclusion of dry period. It has been observed that in many sample households, dairying is a subsidiary occupation to agriculture. So the households mainly engage their family members for dairy operations and only where it is necessary, they engage hired labour.

The depreciation on animals, on fixed capital and on cattle shed and dairy equipments occupy the first, the second and the third places to the total fixed cost irrespective of the animal. Eventhough the net cost of production of milk in the case of inclusion of dry period is Rs. 17838.17 and the cost per litre was worked out at Rs. 10.02, the net cost production of milk in the case of lactation period is Rs. 15950.40 and the cost per litre was Rs. 9.28. The cost of milk production per litre is high in the case of inclusion of dry period than that of in lactation period.

Particulars	Lactation Period only (in Rs.)		Including Dry Period (in Rs.)	
	Amount	Percentage	Amount	Percentage
A. Variable Cost				
(i) Feed Cost				
Green Fodder	2586.02	15.43	2954.73	15.77
Dry Fodder	3310.67	19.75	3630.26	19.38
Concentrates	3934.28	23.47	4611.355	24.62
Total Feed Cost	9830.97	58.65	11196.35	59.77
(ii) Labour Cost				
Family Labour	2376.79	14.18	2570.3	13.72
Hired Labour	1368.66	8.17	1517.31	8.10
Total Labour	3745.45	22.34	4087.61	21.82
Miscellaneous expenditure	290.175	1.73	325.68	1.74
Total Variable Cost	13866.6	82.72	15609.64	83.32
B. Fixed Cost				
Depreciation on cattle shed and dairy equipments	229.77	1.37	268.285	1.43
Depreciation on cows	1390.6	8.30	1489.72	7.95
Interest on Fixed Capital	1275.34	7.61	1366.18	7.29
Total Fixed Cost	2895.71	17.28	3124.185	16.68
Total Cost (A+B)	16762.3	100.00	18733.82	100.00
Income from dung	811.87		895.655	
Net Cost of milk production	15950.4		17838.17	
Average milk production (litres)	1687.55		1768.78	
Cost of milk production (Per litre)	9.28		10.02	

Note: Figures in brackets are percentages to total.

Source: Computed data.

Table 8: Average cost of milk production per animal.

Particulars	Lactation Period only (in Rs.)	Including Dry Period (in Rs.)
A. Variable Cost		
(i) Feed Cost		
Green Fodder	1.49	1.66
Dry Fodder	1.93	2.05
Concentrates	2.28	2.61
Total Feed Cost	5.69	6.31
(ii) Human Labour Cost		
Family Labour	1.39	1.44
Hired Labour	0.81	0.85
Total Labour	2.20	2.29
Miscellaneous expenditure	0.17	0.18
Total Variable Cost	8.06	8.78
B. Fixed Cost		
Depreciation on cattle shed and dairy equipment	0.14	0.15
Depreciation on cows	0.83	0.85
Interest on Fixed Capital	0.75	0.76
Total Fixed Cost	1.71	1.76
Total Cost (A+B)	9.77	10.54
Income from dung	0.49	0.51
Net Cost of milk production	9.28	10.02

Table 9: Average cost of milk production per liter.

Average cost of milk production has been shown in the Table 9.

From the Table 9, it has been observed that the respective cost of one litre of milk was Rs. 9.28 and Rs. 10.02 during the lactation period and with the inclusion of dry period. During lactation period, the feed

costs per litre are Rs. 5.69 and Rs. 6.31 for inclusion of dry period. The next major cost component is family labour which is Rs.1.39 and Rs. 1.44 for two periods respectively. The depreciation on cows gets the third rank in the cost at Rs. 0.83 and Rs. 0.85 per litre for two periods respectively.

Average Cost of Production Per Litre of Milk Using Cost Base Analysis

In order to understand the behaviour of the average cost per litre of milk by the inclusion and exclusion of important items like interest on the value of milch animal and family labour, the base analysis is applied [22].

Cost Base

There are three cost bases namely cost A, Cost B and Cost C.

Where,

Cost A = Cost of green fodder, dry fodder, concentrates, value of hired

Labour, depreciation on the value of the cattle and cattle sheds and miscellaneous expenses.

Cost B = Cost A + Interest on Fixed Capital

Cost C = Cost B + Imputed value of family labour.

Source: Primary data.

According to Cost A, the cost of milk production per litre is higher in the case of inclusion of dry period, which constitutes Rs. 7.25 while it is lower in the case of lactation period, which constitutes Rs. 5.92 respectively. The cost of production per litre in the case of inclusion of dry period is greater than that of lactation period (Table 10).

Cost and Return from Milk

The rate of returns measures the returns per rupee expenditure on various input items. For this, the gross returns are calculated by adding the value of milk yield in rupees with the value of dung. The net returns are measured in three ways namely net returns over variable cost (gross return - variable cost), net returns over total cost excluding family labour (gross return - total cost - family labour) and net returns over total cost including family labour (gross return - total cost) (Table 11),

From the Table 11, it has been observed that the gross returns are higher in the case of inclusion of dry period than in the case of lactation period. This difference is due to the variation in the quantum of milk yield.

Since dairy farming is a subsidiary occupation, the sample households are very keen to observe and compare the variable costs with the returns. They try to increase the yield of milk so as to cover atleast the variable cost. The results of net returns over variable cost, total cost excluding family labour and net returns over total cost reveals the same trend as found in gross returns. It is inferred from the results of net returns over total cost that in the lactation period it was found to be the most remuneration period compared to the inclusion of dry period.

Sl.No.	Cost Base	Lactation Period	Including dry period
1.	A	5.92	7.25
2.	B	6.59	7.91
3.	C	7.89	9.24

Table 10: Average cost of production per litre of milk on the basis of different cost concepts.

Particulars	Lactation Period	Including Dry Period
A. Annual Returns		
Quantum of Milk Yield (in litres)	1687.55	1768.78
Value of Milk Yield (in Rs.)	20767.81	21738.58
Value of dung (in Rs.)	811.87	895.655
B. Gross Returns	21579.68	22634.24
C. Net Returns		
Net Return over variable cost	7713.10	7024.6
Net returns over total cost when family labour is not included in the total cost	7194.18	6470.715
Net returns over total cost when family labour is included in total cost	4817.39	3900.415
Rate of Return per rupee		
Gross return/variable cost ratio	1.58	1.44
Gross return/total cost ratio excluding family labour	1.52	1.39
Gross return/total cost (including family labour)	1.30	1.20

Table 11: Cost and returns per milch in lactation period and including dry period.

The rate of returns per rupee in all respects show a better result for the lactation period than for the inclusion of dry period. Higher cost incurred in the maintenance of cows in inclusion of dry period is found to be the reason for low rate of return in this period when compared in lactation period. Gross rate of returns is recorded as 1.58 rupees in the case of lactation period whereas it was 1.44 in the case of inclusion of dry period.

Level of Attitude of the Members

The level of attitude has been determined by the score values calculated for 15 statements which are related to the performance of dairy co-operatives in Tamil nadu by adopting a scaling technique namely the Likert-Five Point Scale [23]. The statements are:

1. New society registration is very easy
2. Thorough Knowledge about the Co-operative Act
3. Conducting of Co-operative Election periodically
4. Right to get power of voting
5. Sufficient share capital
6. Accounts and records are properly maintained
7. Knowledge about duties and responsibilities of Secretaries
8. Conducting of society meetings properly
9. Adequate services of feeding and fodder
10. Adequate facilities of veterinary health care
11. Marketing facilities
12. Proper payment system is followed
13. Distribution of profit among the members is properly
14. Administrative structure of dairy co-operatives is very well
15. Members is the owner of dairy co-operatives.

To secure the total score for every positive statement scores are allotted in the order by 5 for 'highly satisfied'; 4 for 'satisfied'; 3 for 'indifferent'; 2 for 'dissatisfied' and 1 for 'highly dissatisfied'. Similarly for every negative statement scores are allotted in the order of 1 for 'highly satisfied', 2 for 'satisfied' 3 for 'indifferent' 4 for 'dissatisfied' and 5 for 'highly dissatisfied'. All positive statements bear odd numbers and negative statements even numbers in the 15 statements. This enables

the members to record their responses with proper understanding of the settlements.

The level of attitude has been classified into three categories, namely low level, medium level and high level for analytical purpose. The score value $(\bar{X} + SD)$ and the score value $\leq (X - SD)$ have been classified as high level attitude and low level attitude respectively. The score values between $(\bar{X} + SD)$ and $(\bar{X} - SD)$ have been classified as medium level attitude, \bar{X} and SD are the arithmetic mean and standard deviation calculated from the score values of 300 members [24].

$$(\bar{X} + SD) = (56.72 + 10.98) = 66.70 \text{ and above - High level.}$$

$$(\bar{X} - SD) = (54.71 - 10.87) = 45.74 \text{ and below low level.}$$

$$(\bar{X} - SD) \text{ to } (\bar{X} + SD) = 45.74 \text{ to } 66.70 - \text{medium level.}$$

In order to examine the relationship between the level of attitude of the members towards the performance of dairy co-operatives in Coimbatore district and the profile variables of the members, the Chi-square test has been used. It is calculated by adopting the following formula.

$$\text{Chi-square} = \sum \frac{(O - E)^2}{E} \text{ with } (r-1)(c-1) \text{ degree of freedom}$$

Where,

O – observed frequency

E – Expected frequency

$$E = \frac{\text{Row total} \times \text{Column total}}{\text{Grand total}}$$

c = Number of columns in a contingency table

r = Number of rows in a contingency table.

Whenever theoretical frequencies are less than 5, they should be amalgamated [25].

Table 12 reveals the level of attitude of the 400 sample members.

Source: Primary data.

From the Table 12, it is clear that out of the 400 members 104 (26.00 per cent) fall under the high level attitude group, 210 (52.50 per cent) come under the category of medium level attitude and 86 (21.50 per cent) fall under the low level attitude group

Sex and Level of Attitude

Sex is an important factor in determining the level of attitude

Sl. No.	Level of Attitude	Number of Members	Percentage
1.	High	104	26.00
2.	Medium	210	52.50
3.	Low	86	21.50
Total		400	100.00

Table 12: Level of attitude of the members.

Sl. No.	Sex	Level of Attitude			Total
		High	Medium	Low	
1.	Male	69 (66.30)	145 (69.00)	46 (53.50)	260 (65.00)
2.	Female	35 (33.70)	65 (31.00)	40 (46.50)	140 (35.00)
Total		104 (100.00)	158 (100.00)	86 (100.00)	400 (100.00)

Table 13: Sex of the members and the level of attitude.

Sl. No.	Age (in years)	Level of attitude			Total
		High	Medium	Low	
1.	Below 21	28 (26.90)	42 (20.00)	15 (17.50)	85 (21.25)
2.	21-30	21 (20.20)	59 (28.10)	8 (9.30)	88 (22.00)
3.	31-40	24 (23.10)	32 (15.20)	37 (43.00)	93 (23.25)
4.	41-50	13 (12.50)	41 (19.60)	19 (22.10)	73 (18.25)
5.	Above 50	18 (17.30)	36 (17.10)	7 (8.10)	61 (15.25)
Total		104 (100.00)	210 (100.00)	86 (100.00)	400 (100.00)

Table 14: Age of the members and level of attitude.

of members. The sex of the members has been identified as the first variable. Table 14 shows the sex of the members and their level of attitude.

Source: Primary data.

Table 13 reveals that out of the 400 members, 260 (65.30 per cent) are males and 140 (35.00 per cent) are females. Out of the 104 members with high level of attitude, 69 (66.30 per cent) are male and the remaining 35 (33.70 per cent) are female. Out of the 210 members with medium level of attitude 145 (69.00 per cent) are male and 65 (31.00 per cent) are females. Out of 86 members with low level of attitude, 46 (53.50 per cent) are female and the remaining 40 (46.50 per cent) are male, respectively.

In order to test the relationship between the sex and the level of attitude of the members the following null hypothesis is formulated. "Sex is independent from the level of attitude of the members". The chi-square test was applied to examine the null hypothesis and the computed results are given below:

Calculated value --- 6.6045

Table value at 5 per cent ---5.991

Degrees of freedom --- 2

Inference --- Significant

It is evident from the results that the calculated value is greater than the table value. Hence the null hypothesis is rejected. Therefore, it could be inferred that the sex does not influence the level of attitude of members.

Age and Level of Attitude

Age is one of the important factors in determining the attitude of the members. The age of the members and the level of attitude are shown in the Table 14.

Source: Primary Data.

From the Table 14, it is observed that out of the 104 members with high level of attitude, 28 (26.90 per cent) are in the age group below 21 years followed by 24 (23.10 per cent) in the age group between 31 and 40 years, 21 (20.20 per cent) in the age group between 21 and 30 years, 18 (17.30 per cent) in the age group of above 50 years and 13 (12.50 per cent) in the age group of between 45 and 55 years. Out of the 210 members with medium level of attitude, 59 (28.10 per cent) are in the age group of between 21 and 30 years followed by 42 (20.00 per cent) in the age group of below 21 years, 41 (19.60 per cent) in the age group of between 41 and 50 years, 36 (17.10 per cent) in the age group of above 50 years and 32 (15.20 per cent) in the age group between 35 and 45 years. Further it also shows that out of the 86 members with low level of attitude, 37 (43.00 per cent) are in the age group of between 31 and 40 years followed by 19 (22.10 per cent) in the age group of between 41 and 50 years, 15 (17.50 per cent) in the age group of below 21 years, 8 (9.30 per cent) in the age group of between 21 and 30 years and 7 (8.10 per cent) in the age group of above 50 years, respectively.

In order to test the relationship between age and level of attitude of the members, the following null hypothesis is formulated. "Age is independent from the level of attitude of the members". The chi-square test was applied to examine the null hypothesis and the computed results are given below:

Calculated Value -- 38.9813

Table Value At 5 Per Cent -- 15.507

Degrees Of Freedom -- 8

Inference -- Significant

It is evident from the chi-square that the calculated value is greater than the table value at the 5 per cent level. Hence the null hypothesis is rejected. Therefore, it could be inferred that the age influences the level of attitude of members.

Marital Status and Level of Attitude

The level of attitude may also depend upon the marital status of the members. An attempt has been made to study the relationship between marital status and level of attitude. The marital status of the members and their level of attitude are shown in Table 15.

Source: Primary data.

It is revealed from the Table 15 that out of the 104 members with high level of attitude, 68 (65.40 per cent) are married followed by 24

Sl. No.	Marital Status	Level of attitude			Total
		High	Medium	Low	
1.	Married	68 (65.40)	148 (70.50)	37 (43.00)	253 (63.25)
2.	Unmarried	24 (23.10)	37 (17.60)	44 (51.20)	105 (26.25)
3.	Widow/ Widower	12 (11.50)	25 (11.90)	5 (5.80)	42 (10.50)
Total		104 (100.00)	210 (100.00)	86 (100.00)	400 (100.00)

Table 15: Marital status of the members and level of attitude.

(23.10 per cent) who are unmarried and 12 (11.50 per cent) who are widows/widowers. Out of the 210 members with medium level of attitude, 148 (70.50 per cent) are married followed by 37 (17.60 per cent) who are unmarried and 25 (11.90 per cent) who are widows/widowers. Further it also shows that out of the 86 members with low level of attitude 37 (43.00 per cent) are unmarried followed by 44 (51.20 per cent) who are married and only 5 (5.80 per cent) are widows/widowers, respectively.

With a view to test the following null hypothesis namely “the level of attitude is independent of the marital status” the Chi-square test was applied and the results are shown below:

Calculated value	-- 36.3633
Table value at 5 per cent level	-- 9.488
Degrees of freedom	-- 4
Inference	-- Significant

The chi-square results reveal that the calculated value is greater than the Table value at the 5 per cent level. Hence the null hypothesis is rejected. It could be inferred that there exists a relationship between marital status and level of attitude of members.

Educational qualification and level of attitude

Education is the vital factor which influences the level of attitude of members. The independent identity of the members can be proved only through education. Generally educated persons are able to appreciate the importance of dairy farming. Education widens knowledge, understanding and capability of doing things. Educational qualification of the members and their level of attitude are shown in the Table 16.

Source: Primary data.

From the Table 16, it is seen that out of the 104 members with high level of attitude, 34 (32.60 per cent) are illiterate followed by 27 (26.00 per cent) who have graduate level education, 16 (15.40 per cent) who have higher secondary level education, 14 (13.50 per cent) have secondary level education and 13 (12.50 per cent) who have primary level of education. Out of the 210 members with medium level of attitude, 62 (29.50 per cent) have higher secondary level education followed by 50 (23.80 per cent) who have graduate level education, 39 (18.60 per cent) who have secondary level education, 36 (17.10 per cent) who have primary level education, and 23 (11.00 per cent) who are illiterate. Further it also shows that out of the 86 members with low level of attitude, 31 (36.00 per cent) have primary level education followed by 25 (29.10 per cent) who have secondary level education, 12 (14.00 per cent) who have under graduate level education, 11 (12.80 per

Sl. No.	Educational Qualification	Level of attitude			Total
		High	Medium	Low	
1.	Primary	13 (12.50)	36 (17.10)	31 (36.00)	80 (20.00)
2.	Secondary	14 (13.50)	39 (18.60)	25 (29.10)	78 (19.50)
3.	Higher secondary	16 (15.40)	62 (29.50)	11 (12.80)	89 (22.25)
4.	Graduates	27 (26.00)	50 (23.80)	12 (14.00)	89 (22.25)
5.	Illiterate	34 (32.60)	23 (11.00)	7 (8.10)	64 (16.00)
Total		104 (100.00)	210 (100.00)	86 (100.00)	400 (100.00)

Table 16: Educational qualification of the members and level of attitude.

Sl. No.	Family size	Level of attitude			Total
		High	Medium	Low	
1.	Below 3	24 (23.10)	28 (13.30)	48 (55.80)	100 (28.00)
2.	3-6	63 (60.60)	118 (56.20)	24 (27.90)	205 (51.25)
3.	Above 6	17 (16.30)	64 (30.50)	14 (16.30)	95 (23.75)
Total		104 (100.00)	210 (100.00)	86 (100.00)	300 (100.00)

Table 17: Family size of the members and level of attitude.

cent) who have higher secondary level education and 7 (8.10 per cent) who are illiterate respectively.

For finding the relationship between educational qualification and level of attitude, the following null hypothesis is formulated. “These exists no relationship between educational qualification and level of attitude”. To test the above hypothesis, the chi-square test was applied. The computed results of chi-square are presented below:

Calculated value	-- 59.8960
Table value at 5 per cent	-- 15.507
Degrees of freedom	-- 8
Inference	-- Significant

The calculated value of the Chi-square is greater than the table value at the 5 per cent level. Hence the null hypothesis is rejected. Therefore, it could be inferred that the educational qualification does influence the level of attitude of the members

Family size and level of attitude

Responsibilities of the members differ with the size of their family. Hence the researcher has made an attempt to study the relationship between the family size of the members and their level of attitude. Family size and level of attitude of the members are shown in the Table 17.

Source: Primary data.

From the Table 17, it is inferred that out of the 104 members with high level of attitude 63 (60.60 per cent) have families of between 3–6 members followed by 24 (23.10 per cent) who have families below 3 members and 17 (16.30 per cent) who have families of above 6 members. Out of the 210 members with medium level of attitude 118 (56.20 per cent) they have families of between 3-6 members followed by 64 (30.64 per cent) who have families of size above 6 members and 28 (13.30 per cent) who have families of below 3 members. Further it also shows that, out of the 86 members with low level of attitude 48 (55.80 per cent) have families of below 3 members followed by 24 (28.13 per cent) who have families of between 3 and 5 members and 14 (16.30 per cent) who have families of above 6 members, respectively.

In order to test the relationship between the family size and the level of attitude the following null hypothesis is formulated. “There exists no relationship between the family size and the level of attitude”. The above null hypothesis was tested by applying the Chi-square test. The computed results are given below:

Calculated value	-- 64.5808
Table value at 5 per cent level	-- 9.488
Degrees of freedom	-- 4

Inference -- Significant

It is evident from the Chi-square results that the calculated value is greater than the table value at the 5 per cent level. Hence the null hypothesis is rejected. There exists a relationship between the family size and the level of attitude of the members.

Nature of family and level of attitude

Responsibilities of the members differ with the size of their family. Hence the researcher has made an attempt to study the relationship between the family size of the members and their level of attitude. Family size and level of attitude of the members are shown in the Table 18.

Source: Primary data.

From the Table 18, it is clear that out of the 104 members with high level of attitude, 24 (23.10 per cent) come under the category of joint family and 80 (76.80 per cent) come under the category of nuclear family. Out of the 210 members with medium level of attitude, 41 (19.50 per cent) come under the category of joint family and 169 (80.50 per cent) come under the category of nuclear family. Further it also shows that, out of the 86 members with low level of attitude, 48 (55.80 per cent) come under the category of joint family and 38 (44.20 per cent) come under the category of nuclear family.

In order to test the relationship between the nature of family and the level of attitude the following null hypothesis is formulated. "There exists no relationship between the nature of the family and the level of attitude". The above null hypothesis is tested by applying the Chi-square test. The computed results are given below:

Calculated value -- 41.4981
 Table value at 5 per cent level -- 5.991
 Degrees of freedom -- 2
 Inference -- Significant

It is evident from the Chi-square results that the calculated value is greater than the table value at the 5 per cent level. Hence the null hypothesis is rejected. There exists a relationship between the nature of the family and the level of attitude of members.

Income and level of attitude

There may be various sources of income for some members whereas a few members may have only one source of income. Hence the researcher has made an attempt to study the relationship between income and level of attitude. Table 19 presents the level of attitude and income of the members.

Source: Primary data.

It is observed from the Table 19 that out of the 104 members with high level of attitude 48 (46.20 per cent) have income between Rs.50,000- 75,000 followed by 25 (24.00 per cent) who have income

Sl. No.	Nature of Family	Level of attitude			Total
		High	Medium	Low	
1.	Joint	24 (23.10)	41 (19.50)	48 (55.80)	113 (28.25)
2.	Nuclear	80 (76.90)	169 (80.50)	38 (44.20)	287 (71.75)
Total		104 (100.00)	210 (100.00)	86 (100.00)	400 (100.00)

Table 18: Nature of family and level of attitude.

Sl. No.	Annual Income (in Rs.)	Level of Attitude			Total
		High	Medium	Low	
1.	Below 25,000	23 (22.10)	24 (11.40)	5 (5.80)	52 (13.00)
2.	25,000 – 50,000	25 (24.00)	76 (36.20)	5 (5.80)	106 (26.50)
3.	50,000 – 75,000	48 (46.20)	32 (15.20)	17 (19.80)	97 (24.25)
4.	75,000 – 1,00,000	5 (4.80)	50 (23.80)	38 (44.20)	93 (13.00)
5.	Above 1,00,000	3 (2.90)	28 (13.30)	21 (24.40)	52 (13.00)
Total		104 (100.00)	210 (100.00)	86 (100.00)	400 (100.00)

Table 19: Income of members and level of attitude.

between Rs.25,000–50,000, 23 (22.10 per cent) them who have annual income below Rs.25,000, 5 (4.80 per cent) who have annual income between Rs.75,000 to 1,00,000 and 3 (2.90 per cent) who have annual income of above Rs.1,00,000. Out of the 210 members with medium level of attitude, 76 (36.20 per cent) who have annual income of between Rs.25,000 – 50,000 followed by 50 (23.80 per cent) who have annual income between Rs.75,000 to 1,00,000, 32 (15.20 per cent) who have annual income between Rs.50,000 – 75,000, 28 (13.20 per cent) who have annual income above Rs.1,00,000 and 24 (11.40 per cent) who have annual income below Rs.25,000. Further it also shows that, out of the 86 members with low level of attitude, 38 (44.20 per cent) have annual income between Rs.75,000–1,00,000 followed by 21 (24.40 per cent) who have annual income above Rs.1,00,000, 17 (19.80 per cent) who have annual income between Rs.50,000–75,000, 5 (5.80 per cent) each who have annual income between Rs.25,000- 50,000 and below Rs.25,000 respectively.

In order to test the relationship between the annual income and the level of attitude the following null hypothesis is formulated. "The level of attitude is independent of the income". The chi-square test is applied to examine the null hypothesis and the computed results are given below:

Calculated value - 108.6345
 Table value at 5 per cent - 15.507
 Degrees of freedom - 8
 Inference - Significant

It is evident from the results that the calculated value is greater than the table values. Hence the null hypothesis is rejected and it is inferred that the annual income does influence the level of attitude.

Factors Influencing the Attitude of Members towards the Performance of Dairy Co-Operatives

In order to study the influencing the attitude of members towards the performance of dairy co-operatives, the researcher has formulated 15 statements and they are evaluated by using Likert's five point scale. The five point scale consists of strongly agree, agree, no opinion, disagree and strongly disagree. The score of each statement in the five point scale is five, four three, two and one respectively.

In the present study the principal factor analysis method with the Orthogonal Varimax Rotation is used to identify the factors influencing the attitude of members with the functional coverage of dairy farming.

Analytical framework

Mathematically, factor analysis is somewhat similar to multiple regression analysis. Each variable is expressed as a linear combination of underlying factors. The amount of variance, a variable shares with all other variables included in the analysis, is referred to as communality. The co-variation among the variables is described in terms of a small number of common factors plus a unique factor for each variable. These factors are not over observed.

If the variables are standardized, the factor model may be represented as:

$$X_i = A_{i1} F_1 + A_{i2} F_2 + A_{i3} F_3 + \dots + A_{im} F_m + V_i U_i$$

Where,

X_i = i^{th} standardised variable,

A_{ij} = Standardized multiple regression coefficient of variable
On common factor j

F = Common factor,

V_i = Standardized regression coefficient of variable i on
Unique factor i

U_i = the unique factor for variable i

m = Number of common factors

The unique factors are uncorrelated with each other and with the common factors. The common factors themselves can be expressed as linear combinations of the observed variables.

$$F_i = W_{i1} X_1 + W_{i2} X_2 + W_{i3} X_3 + \dots + W_{ik} X_k$$

Where,

F_i = Estimate of i^{th} factor

W_i = Weight or factor score coefficient

K = Number of variables.

It is possible to select weights or factor score coefficients so that the first factor explains the largest portion of the total variance. Then a second set of weights can be selected, so that it is the second factor which accounts for most of the residual variance subject to being uncorrelated with the first factor. This same principle could be applied to selecting additional weights for the additional factors. Thus, the factors can be estimated so that their factors scores, unlike the value of the original variables, are not correlated. Furthermore, the first factor accounts for the highest variance in the data, the second factor the second highest, and so on.

The principal component factor analysis method is applied to the inter correlation matrix of the fifteen dimensions of the attitude scale and the results were rotated using the Kaiser Varimax criteria. The data validity for factor analysis has been examined with the help of the Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy and the Bartlett test of Sphericity. The KMO measure of 0.5803 at the zero level significance of chi-square satisfies the validity of data for factor analysis. The factor analysis results in seven factors. The factor loading of the variables in seven factors, its communality, Eigen value and percentage of variable explained are shown in Table 20.

The first factor is designed as "Adequate Services" on the basis of loaded variables. Three variables in this category are important with high factor loading. It indicates that among the attitude scale, adequate services of feeding and fodder,

Marketing facilities and adequate facilities of veterinary health care are important attributes in this category. Thus, the 'Adequate Services' rendered by the dairy co-operatives in Coimbatore district is identified as an important factor to influence the attitude of members towards the performance of dairy co-operatives.

The second factor is narrated as "Knowledge about Co-operatives" on the basis of loaded variables. Two variables in this category are important with high factor loading. It indicates that among the various attitude scale, thorough knowledge about the Co-operative Act and Knowledge about duties and responsibilities of Secretaries are

Sl. No.	Variables	Rotated Factor Loading							h ²
		F1	F2	F3	F4	F5	F6	F7	
1.	Adequate services of feeding and fodder	0.9082	0.1537	-0.1729	-0.0299	0.0886	0.0385	0.0378	0.78
2.	Marketing facilities	0.8900	0.1106	-0.1495	-0.0765	0.0595	0.0306	0.0426	0.79
3.	Adequate facilities of veterinary health care	0.6957	-0.2691	0.0654	0.4552	-0.0496	-0.0145	-0.0565	0.91
4.	Thorough knowledge about the Co-operative Act	0.0904	0.9425	0.2056	-0.0361	0.0642	0.0298	0.0059	0.94
5.	Knowledge about duties and responsibilities of Secretaries	0.0512	0.9423	0.2105	-0.0284	0.0467	0.0079	0.0065	0.89
6.	Conducting society meetings properly	-0.1461	0.2095	0.9149	0.0528	0.0137	0.1012	-0.0429	0.77
7.	Conducting of co-operative election periodically	-0.1443	0.1935	0.9017	0.0437	0.0640	0.1043	-0.0205	0.39
8.	Right to get power of voting	0.0804	0.0451	0.0325	0.8947	0.0189	0.0516	-0.0309	0.87
9.	New society registration is very easy	0.2648	0.0465	0.2435	0.6679	0.1236	-0.0431	0.1629	0.64
10.	Sufficient share capital	0.1161	0.1280	0.0743	-0.1848	0.8503	0.0840	-0.0026	0.80
11.	Proper payment system is followed	0.0025	-0.0081	-0.0039	0.2639	0.8390	-0.1205	0.0216	0.83
12.	Administrative Structure of dairy co-operatives is very well	0.0675	-0.0644	0.1163	-0.0280	-0.0379	0.8673	-0.1783	0.81
13.	Accounts and records are properly maintained	0.0008	0.0952	0.2909	-0.2770	-0.0950	0.5889	0.3430	0.88
14.	Distribution of profit among the members is properly	-0.0674	0.4294	-0.3444	0.3855	0.2681	0.5574	0.0237	0.93
15.	Members is the owner of dairy co-operatives	0.0407	-0.0032	-0.0628	0.1171	0.0217	-0.0531	0.9237	0.83
	Eigen values	2.9431	2.5609	1.6752	1.4916	1.2900	1.1915	1.0028	
	% of variation	19.6	17.1	11.2	9.9	8.6	7.9	6.7	
	Cumulative percentage	19.6	36.7	47.9	57.8	66.4	74.4	81.0	

Table 20: Rotated factor matrix for attitude of members.

important attributes. Thus, the “*Knowledge about Co-Operatives*” is identified as an important factor to influence the attitude of members towards the performance of dairy co-operatives.

The third factor is identified as “*Functions of Milk Societies*” on the basis of the loaded variables. Two variables in this category are important with high factor loading. It indicates that among the various attitude scale, Conducting society meetings properly and Conducting of co-operative election periodically are important attributes. Thus, the ‘*Functions of Milk Societies*’ is identified an important factor to influence the attitude of members towards the performance of dairy co-operatives.

The fourth factor is identified as “*Getting Rights*” on the basis of the loaded variables. Two attributes, Right to get power of voting and New society registration is very easy are important in this category. Thus, the rights and power of members in the milk societies is identify an important factor to influence the attitude of members.

The fifth factor clearly indicates the combination of two attributes – Sufficient share capital and Proper payment system is followed. This factor is termed “*Better Financial System*” which influences the attitude of members towards the performance of the dairy co-operatives.

The sixth factor is designed as “*Administration of Co-operative Societies*” on the basis of loaded variables. Three variables in this category are important with high factor loading. It indicates that among the various attitude scale, Administrative Structure of dairy co-operatives is very well, Accounts and records are properly maintained and Distribution of profit among the members is properly are important attributes in this category. Thus, the *Administration of Co-operative Societies* is identified an important factor to influence the attitude of members.

The seventh factor clearly indicates that only one attribute, that is, Members is the owner of dairy co-operatives. This factor is termed as “*Ownership Position*”, which influences the attitude of members with the performance of the dairy farming in Coimbatore district.

Summary of Findings

1. Regarding the attitude of the members, it is categorized into three levels namely high, medium and low levels. It is found that out of the 400 sample members, 26 per cent, 52.50 per cent and 21.50 per cent fall come under the categories of high, medium and low levels attitude, respectively.

2. With regard to examine the relationship between the socio-economic factors and the level of attitude of the members, the chi-square test is applied. It is revealed that the factor, sex, age, marital status, education, family size, nature of family and income have influenced the level of attitude of the members.

3. Regarding the factor analysis, it is found that the following factors are extracted to influence the attitude of members with the performance of dairy farming in Coimbatore district:

- ❖ Adequate services
- ❖ Knowledge about co-operatives
- ❖ Functions of co-operatives
- ❖ Getting rights
- ❖ Better financial system
- ❖ Administration of co-operative societies

- ❖ Ownership position.

Suggestions

The researcher recommends the following on the basis of the analysis of the present study and experience gained during the survey.

- ❖ It is suggested that better results could be obtained if arrangements are made for the regular supply of green fodder and concentrates at cheaper rates. It is desirable that the government should distribute animal feeds at cheaper rates and fodder subsidy may be provided to milk producers through the Animal Husbandry Divisions (AHD).

- ❖ The Government should also take necessary steps to reserve adequate acreage of suitable land for raising fodder, in order to arrest the rise in prices.

- ❖ It is suggested that banks should give more loans and subsidies to the people who are involving in dairy activities especially for the purchase of milch animals.

- ❖ The dairy owners can be given necessary education and training by the Government departments to understand and practice more advanced techniques and scientific methods in milk production.

- ❖ The Lions and Rotary Clubs may organize veterinary medical camps for the benefit of farmers periodically in rural parts.

- ❖ Working conditions of the some of the vendors are very poor. They do not have proper shelter and sanitary facilities. Hence, by providing minimum facilities, the sales can be improved.

- ❖ Market research is to be conducted to find the demand for milk and explore the marketing potentialities for milk.

- ❖ The Government should ensure that the milk producers are assured of better procurement price.

- ❖ All these steps shall pave the way for the greater success of dairy sector.

Conclusion

The inspiration behind this thesis is the realization that the vital significance of dairying lies not only in the production of milk but also in being instrumental for introducing far-reaching changes in the socio-economic dimensions of rural life. Dairying and its related activities, properly nourished and nurtured, could turn out to be veritable mines perpetually unearthing jobs and opportunities in the rural areas in particular. The Indian dairy industry today is poised in milk production. One can visualize the rural India of the future transformed magically by the wide vistas of the infinite possibilities of dairying revolution. If this thesis is to contribute a little to the realization of this economic truth, the main purpose of this thesis would have been fully met.

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