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CHAPTER II

REVIEW OF LITERATURE AND RESEARCH DESIGN

2.1. Introduction

A review of the earlier researches on 'Women in Dairy Management' is essential to identify the areas already investigated so as to pinpoint the hitherto untouched and unexplored spheres for further study. Therefore a brief review of relevant and important pieces of literature connected with the present study on 'Women in Dairy Management' has been carried out. The review of literature has been presented under the following sub-heads viz. participation in dairy activities, knowledge, adoption, decision making, constraints, training, institutional intervention, and income and employment generation.

2.1.1. Women's Participation in Dairy Activities

Farm women attend to not only their household chores but also a number of farm activities and animal husbandry operations.

Singh and Rani (1983) found that participation of women in dairying ranked third after domestic labour in the case of landless labourers whereas it ranked second after domestic work for marginal and small farmers categories.

According to the research findings of Govind (1984) and Govind and Subramaniya (1988), involvement of farm women was widespread and larger in respect of livestock related activities than in respect of crop activities.

Analysing the intensity of participation and involvement of farm women in dairy activities in three agro climatic zones of Haryana, Sardana et al.
(1988) found that almost 95 per cent of the work of dairy cattle is done by the women alone.

Assessing the performance of women in dairy operations in Bihar, Kumari et al. (1988) observed that 80 per cent of all important dairying operations in milk production were performed by women.

Sikka and Swamp (1990) studied the involvement of women in farm and non-farm activities. Men spent a greater proportion of their time on crop production (14.6 per cent) than women (9.7 per cent) while women spent more time on tending cattle (22.6 per cent) than men (17.5 per cent).

Katuwal, . (1990) examined the role of women in livestock production in Kathmandu, Nepal, wherein women's involvement in routine household and livestock production activities are quantified. It is suggested that women devote as much as 50-55 per cent of their time to routine household duties and about 25-30 per cent to livestock production. There is also a significant involvement of women in livestock related activities such as milking and fodder collection.

A study conducted by Anil et al. (1992), in 100 households belonging to the Milk Producers Cooperative Society, Villanganoor (Kerala), reveals that in housing and feeding of cattle, which are adopted within the household, a reasonably effective involvement of women was observed. In selection of animals, breeding and treatment of animals, which require outside contact, involvement of men was significantly higher. There was no significant difference between men and women in their physical involvement in milking.
Comparing the participation of men and women, Chanhan et al. (1994), in their study in Himachal Pradesh, found that women contributed more labour to crop production (63.19 per cent) and dairying (73.19 percent) than men.

Another study by Chaukkan and Smita Sirohi (1995) on women's participation in dairying in Haryana state reveals that the female participation in dairy farming was 108.50, 158.32 and 151.42 man days/year for small, medium and large herd size farm categories constituting about 50 per cent, 52 per cent, and 42 per cent of the total man days of employment respectively.

Analyzing the factors affecting the time utilization of farm women for household, agriculture and dairy activities in ten villages of Lakhimpurkhery District in Uttar Pradesh with 120 respondents, Rajeshkumar et al. (1998) have highlighted the fact that while family size had negative and highly significant correlation with the time utilization in household activities, herd size had positive and highly significant correlation with time utilization for dairy activities. It is due to the fact that the farm women who were having large herd size devoted more time to dairying in comparison to those with small herd size.

2.1.2. Knowledge

Assessing the knowledge level of women in dairy farms of scientific dairy technologies, Sidhu (1980) attributed the high level of knowledge of the majority of women dairy farmers to factors like high educational level, family educational status, landholding and intense exposure to mass media.

Om Prakash (1988), in his study in Karnal District of Haryana, reported that farm women possessed a low level of knowledge in the area of animal health care, but high level of knowledge of management practices.
Investigating dairy farm management, Ohlani and Okuda (1989) conducted a study in Japan with 30 respondents and concluded that knowledge of oestrous signs is indispensible in obtaining high reproductive performance.

Evaluating the role of dairy cooperatives, Hema Tripathi and Kunzro (1992) found that dairy cooperatives had positive impact on member families to get larger profits by utilizing their socio-personal and socio-psychological characteristics. They also found that knowledge about green fodder cultivation was high among respondents from non-members of cooperative systems.

Another study by Hema Tripathi et al. (1995) found that the members of cooperative had more knowledge than non-members of cooperative about artificial insemination, contagious diseases, vaccination against them, green fodder cultivation, green fodder feeding and concentrate feeding.

Shivalingaiah and Veerabhadraiah (1996), in their study in Karnataka, found large farm owners, both male and female, possessing more knowledge about dairy farm practices than small farm owners, male and female and medium farm owners, male and female.

Nisha and Subramanian (1997) studied the knowledge level of farm women in dairy cooperatives in Periyar District, Tamilnadu. They concluded that farm women possessed medium to high level of knowledge of dairy farming. Their level of knowledge was higher regarding dairy management, feeding and breeding, but lower regarding disease control and marketing. The majority of the farm women of dairy cooperatives belonged to low knowledge category.
**Trilochan Singh and Kherde** (1998), in their study in Rajasthan, identified the factors like family, educational status, knowledge about dairy farming practices and mass media, which were negatively correlated to the technological gap.

**Mohar Singh Meena et al.** (1999), in their study carried out in eight villages of Madhopor District, Rajasthan, with 120 samples, concluded that education, family size, landholding, social participation, herd size, milk production, attitude towards dairy farming and economic motivation had positive and significant relationship with knowledge level of dairy farmers regarding improved dairy farming practices.

**Kadian et al.** (2000) conducted a study in three agro climatic zones of Himachal Pradesh. The results indicated that the majority of farmers showed medium level of information input pattern. Analysis of variance showed that there was a considerable degree of variability among the three agro climatic zones and different categories of farmers. Some socio-personal traits of farmers like material possession, mass media exposure, cosmopolitan Vs. local factors and risk orientation were found significantly related to and chief contributors of information input pattern of farmers. Path analysis revealed that cosmopolitan Vs. local factors had the highest direct effect on information input pattern, followed by herd size and innovation proneness. Mass media exposure showed the highest indirect effect through education, cosmopolitan Vs. local factors and innovation proneness.
2.1.3. Adoption

A study on adoption level of rural women of various animal husbandry innovations carried out by Nataraju (1989) in Kamataka State indicated that the majority of dairy farmers have adopted animal management, health, and breeding innovations. Feeding techniques were adopted to a medium extent, while maintenance of records and cattle insurance practices were adopted only by a handful of respondents.

A study by Praveen Kumar et al. (1999), carried out in Renga Reddy District of Andhra Pradesh, has identified that important practices like insurance of milch animals, feeding of green fodder, washing of the animals before milking and vaccination against contagious diseases were fully adopted by the farmers.

Kunzru et al. (1994), in their study in Uttar Pradesh, found that approximately 23 per cent of the respondents from members of cooperative systems accounted for a high level of overall adoption against approximately five per cent of respondents from non-members of cooperative systems. Correlation analysis revealed that there exists positive and highly significant relationship between adoption and family education status, family landholding, innovation proneness, orientation towards competition, level of aspiration, knowledge level, and, attitude towards dairying, dairy cooperatives, and productivity of dairy animals.

A study carried out by Sarojsihag et al. (1996) in Haryana revealed that the mean adoption score of women from Hisar District was significantly higher than the adoption score of women from Jind District. There was marked
difference in the adoption levels between activities like feeding, health care and management. Veterinary surgeon and herd size do not have any significant impact on the adoption level of women regarding animal husbandry innovations.

2.1.4. Knowledge and Adoption

Analyzing the knowledge and adoption behaviour of small and marginal farmers and agricultural labourers practising dairying in Karnataka state, Nataraju and Channegowda (1985) reported that more than 80 per cent of cattle owners knew about improved milch breeds, disease occurrence and precautionary measures against contagious diseases. A relatively larger percentage of agricultural labourers as compared to small and marginal farmers had no knowledge about the above-mentioned animal health and production practices.

Ram Chand et al. (1989), evaluating the extent of adoption of dairy innovation by farm women of Kamal District of Haryana, reported that the variables, namely milk consumption, milk disposal, attitude towards dairy farming, knowledge about breeding, feeding, health care management and overall dairy innovations were found to be positive and significantly correlated to their level of adoption.

Tripathi and Kunzru (1993) have found that high levels of proneness, risk orientation and aspiration towards adopting innovations, and of knowledge and adoption of dairy farm technologies amongst the women were associated with higher levels of milk productivity from their cows. Productivity of the animals was not significantly influenced by competition or management
orientation, or attitude of the women towards dairy farm and dairy cooperatives.

Meena et al. (1999) studied the relationship between knowledge and adoption regarding improved fodder cultivation practices of farmers in Karnal District of Haryana. The result of their study shows that knowledge showed a highly significant positive relationship with the extent of adoption of improved fodder cultivation practices.

2.1.5. Decision Making

Sharma and Singh (1970) reported that the opinion of the women is sought regarding various activities such as seed storage and care of animals.

Dubey et al. (1982), studying the role of rural women in decision making with respect to animal husbandry practices, found that their low participation in decision making included the areas of type of housing for animals, utilization of income from milk, vaccination against contagious diseases, grazing of animals and breeding practices.

Saraswathi et al.’(1987), analyzing the position of farm women in Tamil Nadu, found that the decisions regarding the home consumption or selling of livestock produce were made by women. They further observed that sale proceeds were generally kept with the women and spent by them on what they considered appropriate.

Nand et al. (1988) reported that women were consulted in connection with marketing and storage of farm produce, sale and purchase of animals,
purchase of fertilizers, sowing time and method of sowing and intercultural operations.

Tilottama Pattnaik (1996), after a study in Balasore District in Orissa, reported that the participation of women in farm management and other areas of decision making varied in relation to their status in the family and the size of landholding.

Nita Khandekar and Kunzru (1997), focusing on involvement of rural women in decision making in Madhya Pradesh, found limited decision making power of women regarding economic activities concerning cattle, buffalo and goat enterprises.

Analysing the decision making pattern in dairy farming in Kangra District, Himachal Pradesh, Promila Kanwar and Kherde (1998) identified 18 major dairy practices and concluded that in the majority of the cases men were predominant in taking decisions in all the three zones under study.

Sheokand et al. (1999), undertaking a study in the paddy belt of Haryana in order to find out the effect of landholding size on gender involvement in various livestock activities and decision making, found that though men and women contributed almost equally in performing various livestock activities the women’s share was much less in decisions taken about important animal husbandry activities.

A study conducted by Chhaya Shukla et al. (1998) to analyse the role of women in financial decision making in farm and livestock management in four villages of two blocks of the hilly region in Nainital District, Uttar Pradesh, with 82 households, revealed that women’s involvement was low across the
three categories of farms, viz. marginal, small and medium. Only seven per cent of the women were found to be fully involved in spending money produced by farming, 1.22 per cent were fully involved in decisions relating to taking credit (loans) for farm activities, 13.41 per cent were fully involved in spending money produced by livestock keeping, and 2.44 per cent were fully involved in decisions regarding taking loans for livestock management.

Jyothi et al. (1999), focusing on the empowerment of rural women and their role in decision making in farm, financial and household activities in Kolar District of Karnataka, found that women's participation in farm and financial decision making was positively associated with educational level of husband and empowerment index of women.

2.1.6. Income and Employment

Rajendra Singh and Dinesh Singh (1982), in their study in Azamgarh District of Uttar Pradesh, found that dairy enterprise accounted for about 30 per cent of the total employment of the average women of the sample cultivating households. Further they found a breakup of annual dairy employment of 48 days and also that women of large farmer category were more busy in indoor activities while those of small farmer category were engaged more in outdoor activities. Social status was responsible for such distribution.

Usha Rani et al. (1991) studied the income and employment opportunities of two women dairy cooperatives during two periods, namely before becoming member and after becoming members of cooperative
societies. The findings of the study revealed that the income and employment of the women increased after becoming members of cooperative societies.

Naidu et al. (1992) found that the income of marginal and small farmers increased by 25.5 per cent and 22.5 per cent respectively after joining the cooperative. Further the total income increased correspondingly by 14.6 per cent and 10.5 per cent, and the proportion of total income obtained through dairying increased from 40.0 per cent and 34.5 per cent to 44.8 per cent and 38.2 per cent. Employment opportunities in dairying, either full or part time, are greater for women than for men, and more full time employment has been created amongst marginal than amongst small farmers.

Hema Tripathi et al. (1994), in their study in Uttar Pradesh, examined the overall employment status of rural women in dairying. Correlation analysis revealed that caste, adoption behaviour, input availability, risk orientation, management orientation and attitude towards dairy farming were negatively and significantly correlated, whereas attitude towards employment and productivity of dairy animals were positively and significantly correlated with overall employment status of rural women.

Hema Tripathi and Kunzru (1995), found that among the members of the cooperative system about 67 per cent of rural women were employed in dairying at home as compared to 43 per cent women among the non-members of cooperative system. About 66 per cent rural women from both the systems spent 100 minutes to 400 minutes per day in dairying related activities. About 69 per cent of rural women of both the systems were involved in 9-11dairying related activities, mostly with feeding, management and processing of livestock.
products. However, 34 per cent rural women among the members of the cooperative system were involved in more than 18 activities as compared to 23 per cent women among the non-members of the cooperative system.

**Singh et al.** (1995) analysed the economic efficiency of the milk production system under rural conditions. The results showed that expenditure on feed and labour was 49.7 per cent and 19.96 per cent of the total expenditure. Variable and fixed cost tended to be 70.03 per cent and 29.96 per cent of the expenditure. Feed and labour charges were 70.92 per cent and 28.50 per cent of the variable cost. The economic efficiency for Kurukshetra was low (1.02 per cent) compared to Karnal (5.75 per cent), though the overall economic efficiency was 3.45 per cent.

**Anjani Kumar et al.,** (1999) analysed the magnitude of women’s contribution to family labour income from dairy enterprise in the middle Gangetic plain region of Bihar. The analysis showed that total family labour income from crossbreed cow and local cow was about Rs.25 and Rs.16 per animal per day, of which the share of female labour in the total income was about Rs.5.39 and Rs.1.55 respectively, which accounted for about 34 per cent of the total family income in the group of sample households.

A comparative study of cooperative and non-cooperative systems carried out by Ganesh **Kumar et al.** (2000) at Vizhupuram, Tamil Nadu, reveals that the cooperative has a positive impact on the income of member households.

**Preethi Nauriyal** (2000), in her study in Rajasthan's arid and semi-arid zone, found that rural women can best supplement their family income through
livestock farming with the facility of availability of loan and that the farm women earned Rs.678 to Rs.1858 per animal per year.

2.1.7. Constraints of Dairy Women

_Sunita Kaushik_ (1992) analysed the problems faced by women in the dairy cooperative in Karnal and pointed out certain problems such as lack of knowledge about governmental subsidies, the advantages of dairy cooperative society, credit facilities for purchase of animals, and, timely instructions. Infrastructural and familial problems tended to be ranked lower than educational communication and economic problems.

_Vanita Jain and Varma_ (1992) analysed the inter-gender drudgery in animal husbandry operations in two districts of Haryana State and found that chaffing of fodder is considered to involve the highest degree of drudgery followed by bringing fodder from field, feeding animals, protecting animals against ticks and lice, cleaning of cattle shed, offering water to animals, bathing animals, preparation of cow dung cakes, milking and making other products.

Analysing the constraints related to dairying in Tamilnadu, _Venkatasubramanian and Fulzel_ (1996) identified that lack of timely insemination, repeat breeding in crossbreeds, high cost of concentrates, inadequate green fodder availability, high cost of veterinary services, inadequate knowledge about disease prevention and inadequate veterinary services were the constraints to dairy farming.
2.1.8. Training Needs

Sunita et al. (1992) pointed out the need for training programmes related to progressive dairy farming technologies for the women beneficiaries and emphasised the role of mass media, especially Doordharsan, and field workers.

A study conducted by Antwal et al. (1995) examined the relationship among and the influence of personal, environmental and socio-psychological characteristics of women living in rural areas on their training needs. Data were collected from 30 women in three villages of Udgir Taluk in Lalur District. Some of the major training needs are agriculture, animal husbandry, child development, food and nutrition and home management. Home management and food and nutrition are the most important areas of training needs. Agricultural belief, age and tradition were positively related to training needs whereas education, knowledge index and attitude were found to relate negatively to training needs of rural women.

Malik et al. (2000), in their study in Karnal District in Haryana, found that respondents improved their knowledge and adoption in selected animal husbandry practices after training and continuous education.

2.1.9. Institutional Intervention

Analysing the role of women in dairying, Sen and Jhansi Rani (1990), in Chittor District of Andhra Pradesh, concluded that institutional intervention provided the dairy women farmers an organisational framework for increasing income through procurement and marketing of milk and created a capability
among the women members whereby they would be able to sustain such activities even after the withdrawal of the organisational support.

Identifying the constraints faced by women dairy farmers, Poonam Smith et al. (1991) insist that both NGOs and Government Organisations need to be involved in the planning and implementation of these efforts.

Investigating the impact of the cooperative development programme designed by the NDDB on the empowerment of Indian women dairy farmers in Kolhapur District of Maharashtra State, Arunwayarganger et al. (1995) found that women trained in dairy cooperative systems are more highly empowered than those in non-cooperative development systems.

Evaluating the impact of the white revolution on women in dairying in Andra Pradesh, Radhakrishna Rao (1997) found that villages with dairy cooperatives witnessed changes in female behaviour.

2.2. Theoretical Framework for Analysis

From the above review of literature it can be discerned that, contrary to the myth of female dependency, the fact remains that dairy management in rural India is increasingly becoming a female activity. Millions of poor women in rural India work hard in dairying. Notwithstanding their active participation in various activities in dairying like taking the animal for grazing, chaffing of fodder, washing of cattle, bringing fodder from the field, preparation of feed for animals, offering feed to animals, offering water to animals, cleaning of sheds, protecting against external parasite, milking, product making, mating/insemination and taking the animal to the hospital, their access to support services like extension and training leading to improvement m
knowledge about dairying, access to credit, involvement in decision making process, adoption of scientific practices and control over the resources including the money earned through dairying are severely handicapped. This is, however, not only specific to India but prevails all over the developing world. To have a clear understanding of the research problem taken up for the present study, the problem has been investigated against the backdrop of a theory.

There are three dominant feminist ideological perspectives engaging the discourse on women currently. They are Liberal Feminism, Socialist and Marxist Feminism and Radical Feminism. Among these three ideologies the radical feminist believes that patriarchy, which facilitates gender-based division of labour, pushes women into subordinate and exploitative positions and, it is the sole cause for the subordinate status of women. Against this background the present study endeavors to investigate the position and status of women in the dairy industry and their participation in the different activities of dairying vis-a-vis their control over the resources.

2.3. Issues for Investigation

An in-depth study of women in dairy management should cover individual operators and different kinds of organizations like cooperatives and NGOs. Such a study will have to take into account the differences in participation, knowledge and adoption practices of dairywomen under different types of dairy management and the consequent effect on profitability. The present study aims at pursuing the above issues
2.4. Research Design

2.4.1. Statement of the Problem

The Management of dairying has traditionally been predominantly the responsibility of women. While farm animals are mostly looked after by men, milch animals are taken care of by women. Activities such as shed cleaning, stall-feeding, milking, grazing and marketing are usually done by women. In spite of their major role in dairy farming, women have been left out of the extension and training programmes for animal husbandry. This results in keeping the productivity of milch animals at a low level. Dairying is managed by women in various ways, some as individual operators, some as members of milk cooperatives, and some others as beneficiaries of NGOs.

The planners and policy makers have not given due recognition to the rural women's role in dairy farming, because of inadequate data on the subject. Therefore the role of women in dairy farming needs to be empirically studied in all its dynamic dimensions. In this context, the present study was taken up to analyse the involvement of women in the management of milch animals, their knowledge and adoption level, income generation through dairying and the constraints faced by them in the management of milch animals.

In the present study, the management of dairying refers to not only participation of women in various activities of dairying, but also to the capability of women in dairy management and their control over resources and decision making at domestic as well as organisational level. The study also analyses whether management of dairy activities and the consequent improvement in
the status of women differs among the three categories of management included in the study.

2.4.2. Objectives

The specific objectives of the present study are

1. to study the different types of dairy management in which women are involved in selected blocks of Dindigul District;
2. to analyse the socio economic conditions of women in dairy industry;
3. to assess the knowledge and adoption level of women in respect of scientific dairy management practices;
4. to examine the participation of women in dairy activities;
5. to assess the decision making behaviour of the respondents in dairy management activities;
6. to analyse the factors influencing milk production and income from dairy; and
7. to identify the constraints faced by dairy women in the study area.

2.4.3. Operational Definition of the Concepts Used in the Study

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Age at calving</td>
<td>It refers to the age of the animal at which the first calf is born.</td>
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<tr>
<td>Animal husbandry</td>
<td>A branch of veterinary science, which deals with livestock management, production and breeding</td>
</tr>
<tr>
<td>Artificial Insemination (AI)</td>
<td>Artificial placement of semen in the female genital tract with a view to cause impregnation.</td>
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<tr>
<td>Balanced ration</td>
<td>A term applied to diet, ration, or feed having all known required nutrients in proper amount and proportion based upon recommendations of</td>
</tr>
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</table>
recognized authorities in the field of animal nutrition.

**Bovine**
The term pertains to cattle, the genus *Bos* relating to cow and buffalo.

**Breed**
A group of animals having common origin and processing certain distinguishing characters not common to other animals of the same species.

**Breeding**
The science and art of bringing improvement in animals through the selection and proper mating system.

**Calving interval**
It refers to the period from one calving to the next. Twelve to thirteen months is considered an efficient interval.

**Cattle**
A collection of live domestic animals kept as property or for use by an individual especially bovine animal.

**Concentrate**
It is a feed low in fibre (about 20 per cent) and high (over 60 per cent) in Total Digestible Nutrients (TDN).

**Cream**
It refers to a portion of milk rich in fat.

**Creamery**
An establishment where milk is received and separated to cream and sent it for market.

**Crossbreed**
It refers to offsprings produced from cross-breeding.

**Crossbreeding**
The breeding of one distinct type or breed of animal
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Dairy</td>
<td>The term refers to a farm where milk is produced.</td>
</tr>
<tr>
<td>Dairying</td>
<td>The business of operating a dairy, including distributing and selling milk and its products.</td>
</tr>
<tr>
<td>Dehorning</td>
<td>Removing horns from the cattle; it is usually done at an early age. The horn bud is removed with hot iron or strong caustic.</td>
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<tr>
<td>Dry cow</td>
<td>A cow, which has stopped giving milk.</td>
</tr>
<tr>
<td>Dry period</td>
<td>A period between the end of one lactation and the beginning of another.</td>
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<tr>
<td>Fodder</td>
<td>The stalks and leaves of dry crop plants or those of fresh plants given as feed to livestock.</td>
</tr>
<tr>
<td>Fodder crops</td>
<td>Fodders are mainly obtained from straws of cereals grown for grain, and from plant residues of pulses and other legumes. Some cereals and legumes are also grown for fodder purposes.</td>
</tr>
<tr>
<td>Fodder grasses</td>
<td>Important fodder grasses cultivated in the country are napier or elephant grass, guinea grass.</td>
</tr>
<tr>
<td>Forage</td>
<td>Green stuff obtained from the crops raised for livestock feeding. Usually it refers to roughage and crops grown primarily for use as roughage.</td>
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</tbody>
</table>
| Germ plasm            | Genetic material in the form of sperm or ovum. Generally, superior term plasm, selected on the
<table>
<thead>
<tr>
<th>Term</th>
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<tbody>
<tr>
<td>Hay</td>
<td>Forage preserved in dry form without any appreciable loss in its nutritive value.</td>
</tr>
<tr>
<td>Heifer</td>
<td>A female matured young cow, usually one that has not produced offspring; ready for breeding usually around two years of age.</td>
</tr>
<tr>
<td>Herd</td>
<td>A group of cattle collectively considered as a unit</td>
</tr>
<tr>
<td>Hereditary</td>
<td>Physical and productive characteristics inherited from parents.</td>
</tr>
<tr>
<td>Inseminate</td>
<td>To implant the male sperm into the genital tract of female, either naturally or artificially.</td>
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<tr>
<td>Lactation period</td>
<td>Time between calvings during which the cow produces milk.</td>
</tr>
<tr>
<td>Legumes</td>
<td>Plants of the family <em>Leguminosae</em>, which bear seeds in pods as in peas and beans. Legumes are generally rich in both protein and mineral content and make excellent fodder/forage for dairy cattle. Because of their specialized root system legumes tend to fix nitrogen and enrich the soil.</td>
</tr>
<tr>
<td>Lucerne</td>
<td>Leguminous fodder crop, perennial in nature and provides green nutritionally rich fodder throughout the year.</td>
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Management

The term management has general meaning, depending on context and purpose. Writers like Haimann and McFarland have attempted to explain the term management in three different ways. As a noun it refers to individuals who exercise leadership in an organization, i.e. to the manager. As a process, management refers to activities like planning, organizing, directing, staffing and controlling. As a discipline it refers to a substantive concept describing the subject, i.e. a body of knowledge and practice.

The various definitions of management can be classified into four categories viz. functional school, human relation school, decision making school and system and contingency school. According to the functional school, management is a distinct process consisting of planning, organizing, activating and controlling to determine and accomplish the objectives by the use of people and resources (Terry) (see Rao, V.S.).

According to the human relation school, management is the art of getting things done through and with an informally organized group (Koontz and Donnell) (see Rao, V.S.). According to
the decision making school, management is decision making (Moore, W.E.) (see Rao, V.S.). According to the systems and contingency school, management must achieve results efficiently, effectively. Efficiency speaks about relationship between inputs and outputs. Effectiveness is concerned with getting things done. Based on these definitions, dairy management in the present study refers to various activities relating to dairying, namely collection of fodder, grazing the animal, cleaning the shed, offering feed and water, milking to accomplish the objective of increasing milk production and family income.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Market milk</td>
<td>Fluid milk sold to the consumers.</td>
</tr>
<tr>
<td>Pasteurization</td>
<td>A heat treatment process, which secures destruction of pathogenic organisms without impairing the commercial value of the product</td>
</tr>
<tr>
<td>Pasteurized milk</td>
<td>Milk, which has undergone pasteurization.</td>
</tr>
<tr>
<td>Solids-not-fat (SNF)</td>
<td>The percentage of total solids in dairy products minus the fat percentage. Solids-not-fat present in milk means the total solids minus butter fat</td>
</tr>
<tr>
<td>Selection</td>
<td>Choosing animals to produce progenies which will contribute to next generation</td>
</tr>
<tr>
<td>Service</td>
<td>The act of natural breeding in cattle</td>
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</tbody>
</table>
It is a high moisture (65-75 per cent) fermented forage (or other herbage) in fresh or wilted form preserved by anaerobic fermentation controlled by lactic bacteria.

That part of the mature plant remaining after the removal of grains by thrashing or combing; it is a low nutritive cattle feed with poor protein content and the highest crude fibre percentage.

2.4.4. Methodology

The study is a descriptive one based on survey method employing both primary and secondary data.

Area of Study: The study has been carried out in Dindigui District of Tamilnadu. The Dindigui District is situated about 400 km to the south of Chennai, the capital of Tamil Nadu State. The district is located between latitudes 10°05′N and 10°9′N and longitudes 77°30′E and 78°20′E. It is surrounded by Tiruchirapalli District in the north and the east, Coimbatore District on the west, Madurai District and Theni District on the south and Kanyakumari District and Erode District on the north. The total area of Dindigui District is 6,266.64 sq kms (1991 census) comprising of 2,66,951 hectares of cultivated land, out of which 5092 hectares are irrigated. The district has been divided into 14 blocks. The main crops in the district are rice, millets and other cereals, pulses, sugarcane, groundnut, gingelly, cotton, mango, tamarind, and flowers like marigold and jasmine.
Data on livestock and poultry population of Dindigul District are furnished in the Table 2.1.

Table 2.1

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cattle</td>
<td>368614</td>
</tr>
<tr>
<td>2</td>
<td>Buffalo</td>
<td>105266</td>
</tr>
<tr>
<td>3</td>
<td>Sheep</td>
<td>283747</td>
</tr>
<tr>
<td>4</td>
<td>Goat</td>
<td>226092</td>
</tr>
<tr>
<td>5</td>
<td>Poultry</td>
<td>593024</td>
</tr>
</tbody>
</table>

Source: (1991 censuses) Department of Animal Husbandry, Dindigul

Sampling Methods Adopted: The present investigation has adopted multistage sampling method for the selection of dairy units under different categories of management and the respondents (Vide fig 2.2).

Fig. 2.2
Multi-Stage Sampling

Number of Blocks In Dindigul District-14

Stage I Selection of blocks based on different types of dairy management

- Nilakottai
- Natham
- Oddanchatram

Stage II Different types of management of dairy unit

- Pallapatti Milk Cooperative Society
- NGO
- Individual operators

Total No. of women milk producers

- 250
- 550
- 536

Stage III Selection of respondents (25%)

- 63
- 137
- 134

Total number of respondents

334
Table 2.2
Sample Frame and Sample Size of the Study

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Organizations</th>
<th>Total No. of women milk producers</th>
<th>Sample size in percentage</th>
<th>Sample respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pallapatti Milk Producers Cooperative Societies (Pallapatti)</td>
<td>250</td>
<td>25</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>NGO (Natham)</td>
<td>550</td>
<td>25</td>
<td>137</td>
</tr>
<tr>
<td>3</td>
<td>Individual Operators (Oddanchatram)</td>
<td>536</td>
<td>25</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1336</td>
<td>25</td>
<td>334</td>
</tr>
</tbody>
</table>

Source: Records of the organizations

Selection of Sample: Among the milk societies in Dindigul District, Pallapatti Milk Cooperative Society at Pallapatti in Nilakottai Block has a large number of women milk producer members and its milk production is also the highest among the Milk Cooperative Societies in Dindigul District (Milk Cooperative Society 1999). Hence Pallapatti Milk Cooperative Society at Pallapatti in Nilakottai Block has been selected for the study. Moreover Nilakottai Block is the largest milk producer in Dindigul District.

Among the three NGOs viz. St. Joseph’s Development Trust, Batlagundu, Dindigul Multipurpose Service Society (DMSS), Dindigul and Association of Sarva Seva Farms (ASSFA), Natham, working for dairy development in Dindigul District, ASSEFA at Natham Block has built up an extensive organization of beneficiaries. It has divided the service villages into four segments, namely Natham, Sirugudi, Sendurai and Sethur. Among the four segments, Sirugudi segment has the highest number of women producers and the milk production is also the highest. Hence Sirugudi has been selected.
for the study. It is to be noted that Natham Block has the largest cow population in Dindigul District.

**Oddanchatram Block** with the largest buffalo population in Dindigul District has been a traditional milk producing area. The individual milk producers, mostly women, sell milk to privately owned creameries. Therefore individual women milk producers of Oddanchatram Block have been selected from the records of the creameries.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Particulars</th>
<th>Nilakkottai</th>
<th>Natham</th>
<th>Oddanchatram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Geographical area (in Sq. Km)</td>
<td>24978</td>
<td>65271</td>
<td>50847</td>
</tr>
<tr>
<td>2.</td>
<td>Revenue villages</td>
<td>28</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>3.</td>
<td>Total Population</td>
<td>131630</td>
<td>119222</td>
<td>119553</td>
</tr>
<tr>
<td>4.</td>
<td>Female Population</td>
<td>64827</td>
<td>58963</td>
<td>59404</td>
</tr>
<tr>
<td>5.</td>
<td>Rural Female Population</td>
<td>57657</td>
<td>N.A.</td>
<td>59404</td>
</tr>
<tr>
<td>6.</td>
<td>Literacy rate (%)</td>
<td>45</td>
<td>18</td>
<td>48</td>
</tr>
<tr>
<td>7.</td>
<td>Area shown (in hectares)</td>
<td>13028</td>
<td>208447</td>
<td>247937</td>
</tr>
<tr>
<td>8.</td>
<td>Irrigated area (in hectares)</td>
<td>7161</td>
<td>5933</td>
<td>10285</td>
</tr>
<tr>
<td>9.</td>
<td>Cattle population</td>
<td>9239</td>
<td>12591</td>
<td>5912</td>
</tr>
<tr>
<td>10.</td>
<td>Buffalo population</td>
<td>2082</td>
<td>1140</td>
<td>6593</td>
</tr>
<tr>
<td>11.</td>
<td>Milk Production (in litres)</td>
<td>2689956</td>
<td>174662</td>
<td>60435</td>
</tr>
</tbody>
</table>

Source: District Rural Development Agency (1999), Dindigul
Note: * Not Available

**Selection of Respondents:** Twenty-five per cent each of the total milk producer members of the Pallapatti Milk Cooperative Society, the Self Help Group members of ASSEFA at Natham and the individual milk producers
supplying milk to the creameries (Individual Operators) in Oddanchatram Block were selected by simple random sampling method.

Sources of Data: Data were collected from both primary and secondary sources. Secondary sources for the milk cooperative society include membership register, production register, milk distribution register and audit report of the milk cooperative society. Documents from the Office of the Sub-Registrar, Dairy Cooperatives and Joint Director, Animal Husbandry, Dindigul District, were also used. Secondary sources for NGO were membership register, milk production register, loan ledgers and audit reports. Relevant information has been elicited by holding discussions with the officials of the milk cooperative society and the NGO. The primary data were collected from the sample respondents through a pre-tested and a well-structured interview schedule.

Tools of Data Collection: Two separate pre-tested interview schedules were designed, one for the officials of the cooperative milk society and the Project Officer of the NGO and another for the women dairy farmers. The first schedule for the officials aims at seeking particulars on women members, share capital, loan particulars, details of milk production, distribution, marketing strategies and profit realized. The second schedule has four parts. The first part contains questions related to socio-economic profile, the second part relate to cattle particulars and cattle management practices, the third part contains questions on the impact of dairying on women dairy farmers and the fourth part identifies the problems faced by the women dairy farmers. Knowledge and adoption scales have been constructed for the assessment of
knowledge and adoption levels of women in respect of scientific dairy farming practices.

Measurement of Knowledge Level: Knowledge refers to the quantum of information and understanding, which can be recalled through memory of ideas or events by the respondents about cattle and buffalo production practices.

Knowledge about dairy animal management practices has been measured through knowledge tests. For measuring the knowledge about calf management, inputs purchase, housing, clean milk production, breeding, feeding, health care and marketing and finance, knowledge tests based on Goswamy's scale, 1995, were developed for the study.

The different variables included under knowledge test indicate the extent of knowledge which the respondents possessed at the time of answering the questions.

The steps followed in developing the knowledge test for this study are discussed below.

Item Collection: The content of knowledge test is composed of different items. Items for the test were compiled after scrutiny of the related literature, discussions with field extension personnel, specialists in veterinary and animal science and academicians. The questions were designed to test the knowledge level of the dairy farm women about calf management, inputs purchase, housing, clean milk production, breeding, feeding, health care and marketing and finance.
Initial selection of items: The initial selection of items was done on the basis of following criteria.

*Questions should kindle the thinking rather than tap the rote memory; and,

*Questions should discriminate between the well-informed farm women from the poorly informed one by having a certain difficulty value.

Based on these two criteria 213 items were initially constructed in question form, consisting of 31 items on calf management, 14 items on inputs purchase, 24 items on housing, 23 items on clean milk production, 20 items on breeding, 52 items on feeding and 37 items on health care and 12 items on marketing and finance.

A schedule was prepared with these 213 items to be administered to dairy farm women for item analysis, validating and screening out the items.

Item Analysis: Guilford (1954) has pointed out that item analysis of a test usually yields two kinds of information. It provides an index of item difficulty and an index of item discrimination. The item difficulty tells us how difficult an item is, whereas, the index of item discrimination indicates how well the item measures or discriminates in agreement with the rest of the scale or how well it predicts some external criterion.

The items were checked and modified on the basis of a pre-test. The items were administered to 60 randomly selected dairy farm women. Each respondent was given score 1 or 0 for each item according to whether the answer was right or wrong. The total number of correct answers given by £
respondent out of the total number of items was the knowledge score secured by the respondent. After calculating the scores obtained by 60 respondents, the scores were arranged in descending order. The respondents were then divided into six equal groups (G1...G6) each having 10 respondents. Respondents in each group were arranged in descending order according to the total score obtained by each one of them. For item analysis only four extreme groups (G1 and G2, G5 and G6) with high and low scores were considered for computation of item difficulty and item discrimination indices.

Item Difficulty Index: The difficulty index of an item was defined as the proportion of respondents giving correct answers to that particular item. This index was calculated by the following formula:

\[ \text{Difficulty index in percentage of } i^{th} \text{ item.} \]

\[ \frac{\text{Number of respondents giving correct answers to } i^{th} \text{ item.}}{\text{Total number of respondents to whom } i^{th} \text{ item was administered.}} \times 100 \]

where,

\[ \text{Pi} \]

\[ \text{ni} \]

\[ \text{Ni} \]

Item Discrimination index: The item discrimination index was calculated by means of the formula given below.

\[ \left( \frac{(S1+S2)-(S5+S6)}{N} \right)^{1/3} \]

where, S1, S2, S5 and S6 are the frequencies of correct answer in G1, G2, G5 and G6 groups respectively and \( N \) = Total number of respondents in the sample for item analysis.
Selection of Items for Test: Two criteria viz. item difficulty index and item discrimination index were considered for selection of items in the final format of the knowledge test. In the present study, items with difficulty index ranging from 30 to 80 and discrimination index ranging from 0.30 to 0.55 were included in the final knowledge test. A total of 93 items were thus selected for the test and the remaining 120 items of the pre-test were discarded.

Scoring Method: The scores for the correct replies of a particular respondent indicated her level of knowledge about each technology.

- The range of scores on calf management = 0-12
- The range of scores on inputs purchase = 0-11
- The range of scores on housing = 0-12
- The range of scores on clean milk production = 0-13
- The range of scores on breeding = 0-12
- The range of scores on feeding = 0-12
- The range of scores on health care = 0-14
- The range of scores on marketing and finance = 0-07
- Total Scores = 93

Content Validity of Knowledge Test: In the final selection of items, care was taken to include items covering the entire universe of relevant behavioural aspects of the respondents with respect to knowledge about all the technologies used in this study. Items were collected through various sources including specialists in the concerned subject and it was assumed that all scores obtained by administering the tests measured knowledge of the respondents as it was intended.

Reliability: The reliability of the knowledge test developed was tested by test re-test method. The knowledge test with the finally selected items on eight
techniques was twice administered to 30 dairy farm women owning livestock, with an interval of 15 days. The coefficient of correlation of the scores of the respondents between the first and second test was estimated using Pearson’s Correlation coefficient formula. The coefficient of correlation value between the two scores was 0.830, which was found to be significant at one per cent level of probability. Hence the knowledge test constituted was highly stable and dependable for measurement of the knowledge variables.

**Measurement of Adoption Level:** The same steps followed for developing knowledge scale is used for developing adoption scale in this study. After item collection 124 items were initially constructed in the question form consisting of 22 items on calf management, 10 items on inputs purchase, 16 items on housing, 20 items on clean milk production, 28 items on breeding, 18 items on feeding and 14 items on health care management.

After item analysis, as done in the knowledge measurement 49 items were finally selected in all the above scientific technologies.

The scores of correct replies of a particular respondent indicated her level of adoption of each technology:

- The range of scores on calf management = 0-7
- The range of scores on inputs purchase = 0-5
- The range of scores on housing = 0-7
- The range of scores on clean milk production = 0-7
- The range of scores on breeding = 0-7
- The range of scores on feeding = 0-11
- The range of scores on health care = 0-5

Total scores = 49
Statistical Tools Used: The statistical tools used in the analysis of data are given below.

1. Mean and SD: Mean and Standard Deviation were applied to classify the respondents into three groups, namely those below the mean-S.D. as below average performance and those above mean+S.D. as high performance and those in between as medium performance.

2. T-test: T-test was used to test the significance of the difference between pairs of means.

3. Simple Correlation: Simple correlation was used to find out the strength of relation between pairs of variables.

4. Multiple Regression Analysis: Regression equations of different forms were used to find out the cause and effect relationship among several variables.

5. Path Analysis: Path analysis was used to find out the direct and indirect effects of the independent variables used in the study. This also acted as confirmation test for the regression analysis.

6. Wilcoxon Matched Pair-Signed Rank Test: Wilcoxon matched pair-signed rank test was used to assess the decision making behaviour of males and females in each family.

For the above statistical computations a standard package SPSS version 8.0 was used.
2.4.5. Limitations

The study has focused on the performance of the women dairy farmers in one district with its sample drawn from three blocks. In view of the limited time and material resources of the investigator, the size of the sample had to be restricted to 334 respondents, which is expected to reflect the salient features of the problems of the women dairy farmers in the study area.

The period of the study was limited to three years 1997-2000, since a longer period was not feasible for collection of primary data due to limitations of recollection.

2.4.6. Chapterisation

Chapter I introduces the subject of empowerment of women in dairying in India and the various categories of dairy management.

Chapter II covers review of literature and design of the study.

Chapter III deals with the emerging challenges in dairy industry in India in the context of economic reforms.

Chapter IV portrays different categories of dairy management, viz. Pallapatti Milk Producer's Cooperative Society, NGO at Natham, and, creameries in Oddanchatram Block.

Chapter V presents the socio-economic profile of the dairy farmers and details about the milch animals under different categories of dairy management.

Chapter VI seeks to estimate the knowledge and adoption level of women about scientific dairy technologies.
Chapter VII covers the gender-wise participation in dairy activities and decision making process.

Chapter VIII seeks to gauge the impact on dairy households, contribution of women in dairying at household level under different types of management.

Chapter IX presents the major findings and conclusions of the study and brings out their policy implications.
REFERENCES


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