

**A STUDY ON ADOPTION OF IMPROVED DAIRY
MANAGEMENT PRACTICES, INFORMATION
SOURCES CONSULTED AND PROBLEMS FACED
BY DAIRY FARMERS IN BANGALORE DISTRICT**

K. PALVANNAN, B.Sc., (Agri.)

**DEPARTMENT OF AGRICULTURAL EXTENSION
UNIVERSITY OF AGRICULTURAL SCIENCES
BANGALORE**

1985

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K. PALVANNAN, B.Sc., (Agri.)

Thesis submitted to the
University of Agricultural Sciences, Bangalore
in partial fulfilment of the requirements
for the award of the degree of

Master of Science (Agriculture)

in

AGRICULTURAL EXTENSION

Dedicated
To My Beloved Parents,
Sri, B. G. Kanniappan
and
Smt. M. Indirani

DEPARTMENT OF AGRICULTURAL EXTENSION

UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE.

CERTIFICATE

This is to certify that the thesis entitled " A STUDY ON ADOPTION OF IMPROVED DAIRY MANAGEMENT PRACTICES, INFORMATION SOURCES CONSULTED AND PROBLEMS FACED BY DAIRY FARMERS IN BANGALORE DISTRICT, " submitted by Mr.K.PALWANNAH for the degree of MASTER OF SCIENCE (AGRICULTURE) IN AGRICULTURAL EXTENSION, of the University of Agricultural Sciences, Bangalore, is a record of research work done by him during the period of his study in this University under my guidance and supervision, and the thesis has not previously formed the basis of the award of any degree, diploma, associateship, fellowship or other similar titles.

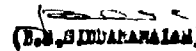
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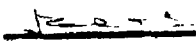
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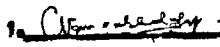
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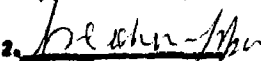
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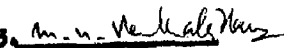
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(S.PALWANJAN)

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CONTENTS

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
I.	INTRODUCTION ...	1
II.	REVIEW OF LITERATURE ...	7
III.	MATERIAL AND METHODS ...	26
IV.	RESULTS ...	42
V.	DISCUSSION ...	76
VI.	SUMMARY ...	98
VII.	REFERENCES ...	103
	APPENDICES ...	I - XI

LIST OF TABLES.

<u>Number</u>	<u>Title</u>	<u>Page</u>
1.	Classification of respondents based on their extent of adoption of improved dairy management practices.	43
2.	Extent of adoption of cross-bred cows by dairy farmers.	46
3.	Extent of adoption of recommended quantity of roughages and feed concentrates.	47
4.	Extent of adoption of artificial insemination, vaccination and sanitation measures.	48
5.	Extent of adoption of navel cord sealing, dehorning and improved method of milking.	49
6.	Extent of adoption of animal insurance record maintenance and drug utilisation.	50
7.	Extent of adoption of farmers belonging to different age groups.	52

<u>Number</u>	<u>Title</u>	<u>Page</u>
8.	Extent of adoption among the farmers belonging to different educational level.	53
9.	Extent of adoption among the farmers belonging to different holding groups.	55
10.	Extent of adoption among the farmers belonging to different livestock position groups.	56
11.	Extent of adoption among the farmers belonging to different herd size groups.	57
12.	Extent of adoption among the borrowers and non-borrowers farmers.	58
13.	Extent of adoption among the farmers belonging to different category of organisational participation.	60
14.	Extent of adoption in relation to the cosmopolitaness of dairy farmers.	61
15.	Extent of adoption in relation to the economic motivation of dairy farmers.	62
16.	Extent of adoption in relation to the mass-media participation of dairy farmers.	63

<u>Number</u>	<u>Title</u>	<u>Page</u>
17.	Extent of adoption among the farmers having different levels of aspiration.	65
18.	Extent of adoption in relation to extension agency contact of the dairy farmers.	66
19.	Extent of adoption in relation to the extension participation of farmers.	67
20.	Extent of adoption in relation to awareness about dairying of dairy farmers.	69
21.	Information sources consulted by dairy farmers.	70
22.	Information sources consulted by different adopter categories for medical and non-medical purpose.	71
23.	Economics of dairy enterprise.	73
24.	Problems expressed by dairy farmers in different rank orders.	75

LIST OF FIGURES

<u>Number</u>	<u>Title</u>	<u>Between pages</u>
1.	Map of Devanahalli Taluk.	26-27
2.	Extent of adoption of recommended practices by dairy farmers.	30-31
3.	Economics of dairy enterprise.	73-74
4.	Rank order of problems expressed by dairy farmers.	75-76.

etc

INTRODUCTION

I. INTRODUCTION

Dairy enterprise is gaining more importance now-a-days. With the introduction of cross-bred cows, dairying has become very remunerative enterprise. The cross-bred cows have the potentiality to yield as high as 6000 litres per lactation. Obtaining higher milk yield in cross-bred cows requires not only the rearing of cross-bred cows but also the complete adoption of improved dairy management practices, which have been evolved as a result of long years of research and experimentation.

Farmers in rural areas are taking up this enterprise either as a subsidiary occupation or as a main business depending upon the resources they have. Dairy enterprise contributes to the rural economy by providing a continuous employment to family labour and assuring a steady income throughout the year. Commenting on this aspect, Rao (1974) opined that socially oriented dairy development can help to set up a spiral of increasing rural employment and productivity as well as savings and investments in food production.

Recognising the importance of dairying, the Government of Karnataka started Bangalore Dairy with the aid of UNICAF in 1965. This marked the entry of Karnataka State into the field of modern dairying in India. The milk shed area of Bangalore dairy comprises of the whole district of Bangalore, some parts of Kolar and Tumkur districts, within a radius of 64 kilometers. The organised milk marketing system which was introduced by Bangalore Dairy gave a boost to dairy enterprise.

Later in 1974, Karnataka Dairy Development Corporation (KDDC) was started on the lines of AMUL pattern. The main objective of KDDC is to develop an integrated programme for increasing milk production in the rural areas of southern Karnataka by providing facilities for milk collection, processing and marketing facilities besides ensuring technical services on health coverage. The total milk produced in the state during 1985 was 1,37,59,818 Kg per month, while it was 68,49,682 Kg per month in Bangalore milkshed area. Anonymous (1985).

Recently in 1985, an integrated cattle-cum-dairy development project has been launched in Karnataka with assistance of World Bank. The project has envisaged accelerated production of milk in defined areas, covering certain districts of the state, by providing all the necessary technical inputs and organised milk marketing facilities to farmers.

This shows that sustained efforts are being made to develop the dairy business in all respects. There is an assured market to the milk producers through KDDC. The technical guidance and services are extended to the farmers by K.D.D.C. and the state department of Animal Husbandary and Veterinary Sciences. There is also timely supply of production inputs through the dairy development organisations. Further, the small and marginal farmers as well as landless labours are encouraged to take up dairying as a subsidiary occupation through Integrated Rural Development Programme. All this has created a climate for the growth of the dairy enterprise in the state.

In spite of this, the average milk production in Karnataka is as low as 120 Kgs. per cow per year, while it is 4250 Kgs in U.S.A. and 4220 Kgs. in Holland, the leading milk producing countries (Singh and Moore, 1981). Some attempts have been made in the past to study the role of dairy enterprise in rural economy and to investigate the extent of adoption of improved dairy management practices by small and marginal farmers in Karnataka (Nashippan, 1975, Rao, 1968, Avanti, 1981 and Singh and Singh, 1981). However, comprehensive studies have not been conducted to find out the extent to which the improved dairy management practices are adopted by the dairy farmers as such.

The extent of adoption of improved dairy management practices is supposed to be related to several personal and socio-psychological characteristics of farmers. Further, the profits obtained by dairy farmers is believed to depend upon the herd size. This study was, therefore, conducted with the following objectives in view.

Objectives of the study

1. To study the extent of adoption of improved dairy management practices among the dairy farmers.
2. To explore the association between personal and socio-psychological characteristics of farmers with their extent of adoption of improved dairy management practices.
3. To find out the different sources of information consulted by dairy farmers for getting information on improved dairy management practices.

4. To investigate the economics of dairying among the farmers belonging to different categories of adoption of improved dairy practices.
5. To find out the problems involved in adopting improved dairy management practices.

Scope of the study

This study is expected to throw some light on the extent of adoption of improved dairy management practices. The study also helps to identify the personal and socio-psychological variables, which influence the adoption of dairy management practices.

This investigation might further help to know the most important sources consulted by dairy farmers for getting information on dairy management practices. The study would identify the problems involved in adopting the improved dairy practices, besides pointing out the average cost incurred by the farmer in producing milk and the returns he obtains under his conditions.

Limitations of the study

The student researcher had the limitation of time and resources. The study was conducted in only one taluk, which had produced the highest quantity of milk. The respondents of the study are those farmers who supply the milk to Karnataka Milk Producers' Co-operative Society. Other farmers who owned dairy but were not supplying milk to Karnataka Milk Producers' Co-operative Societies were excluded for the purpose of this study. Hence, the findings are applicable only to the sample of the farmers studied. Generalisation to other areas with different social setting may be inappropriate.

Definitions of the terms used in the study.

Overall adoption level :- This refers to the extent to which the farmer has adopted the different improved dairy management practices, which have been included in the study. It is expressed in terms of adoption quotient.

Organization participation:- It is the degree of involvement of the respondents from mere membership to his active participation in the activities of local formal organizations, like Village panchayat, dairy co-operatives, farmers forum, land development bank etc.

Level of aspirations:- It is the respondent's desire for future state of being, expressed in terms of type of occupation desired for his son, farm size development and expected increase in the farm income.

Cosmopolitiness:- It is the degree to which the individual has contact outside the community, such as visiting dairies, Dairy Development Organizations and Dairy/Veterinary Colleges.

Extension contact:- It is the degree of personal contact of the respondent with different extension personnel like, extension guide, agriculture assistant, veterinary doctor, livestock inspector and other agencies for the purpose of getting information on dairy management practices.

Extension participation:- It is the extent of participation of the respondent in different dairy extension activities like group meetings, exhibitions, cattle fairs, campaigns, film shows on dairying etc.

Mass media participation:- It is the extent of participation of the respondents in the mass media, like newspaper reading, radio listening,

Livestock positions- It is defined as the number of farm animals like bullocks, buffaloes, cows, sheep, goats and pigs possessed by the dairy farmer.

Milk yield- This refers to the number of milk cows/buffaloes possessed by the dairy farmer.

Organization of the study

This study has been organized into seven chapters. Chapter I relates to introduction in which the need for the study, purposes, limitation and scope of the study are presented, followed by definitions of the terms used. Chapter II consists of review of the past literature relating to the objectives of the study. Chapter III deals with the material and methods employed in conducting of the present study. The results of the study are presented in chapter IV, followed by discussion in chapter V, summary in chapter VI and references in VII chapter.

REVIEW OF LITERATURE

II. REVIEW OF LITERATURE

In accordance with the objectives of the study, the review of literature is furnished on the following dimensions.

1. Extent of adoption of improved dairy management practices.
2. Association of the personal and socio-psychological characteristics with the extent of adoption.
3. Information sources consulted by farmers.
4. Economics of dairying.
5. Problems in adoption of dairy management practices.

Extent of adoption of improved dairy management practices

Sathyanarayanshi (1967) reported that the extent of adoption of disease control measure in cattle was the highest followed by breeding, artificial insemination and castration of bulls.

Rao (1968) concluded in his study that 97 percent of farmers had adopted preventive vaccination, while 87 percent adopted artificial insemination for their breeds, 41 percent adopted the castration and 11.5 percent were rearing improved breeds.

White (1968) in a study made in Canada, reported that the general level of the adoption of improved practices like artificial insemination, maintenance of production records, milking machines, pipeline milker and cooler were found to be quite low, with the exception of use of milking machine.

U

Reddy (1971). reported that animal husbandary practices like castration of scrub bulls by Burdizzo method and artificial insemination were adopted by 98 percent and 94 percent of farmers, respectively. The feeding of dairy cattle with premixed concentrate feed was found to be a less adopted practice.

Sinha and Sinha (1971) found that among 143 dairy farmers, hardly one-fifth of the respondents were non-adopters of artificial insemination, while more than half of the respondents were non-adopters of feed mixtures.

Channa Gowda et al. (1974) reported that 66 percent of dairy farmers in Devanahalli taluk had adopted artificial insemination for their cows.

Govindappa (1974). found that majority of the small farmers and large farmers had low adoption level. The two groups of the respondents did not differ significantly in their adoption level of improved dairy practices.

Jethiraj(1974) reported that 11 percentage of the respondents had adopted all the four selected practices under study, 18 percent adopted 3 practices, one percent adopted two practices, while 2 percent of the respondents did not adopt even a single recommended practice.

Sinha et al. (1974) reported that 45.4 percent of the potential adopters had adopted cattle feed mixture in Amritsar area of Punjab.

U. Channegowda et al.(1976) reported that considerable percentage of dairy farmers (16 %) had fed dry fodder, green fodder and feed concentrates to their cows in Bangalore North and Devanahalli taluks of Bangalore district.

Patil et al. (1976). reported that 94 percent dairy farmers in Bangalore milk shed area used green grass as fodder, 100 percent farmers used maize straw, 75 percent used groundnut cake and 84 percent used feed mixtures. Nearly 73 percent of the respondents interviewed had a good cattle shed and 100 percent of the farmers took their animals to veterinary dispensaries when needed.

Tayappa and Betty (1976) concluded that majority of the dairy farmers were using commercial grain mixtures and no one was feeding green forages regularly.

Aravath Kumar (1977). reported that the level of use of veterinary facility was high in case of farmers maintaining only improved breeds than those maintaining only local breeds.

Singh et al. (1977) reported that 45 percent of the respondents had high adoption, about 32 percent and 23 percent belonged to the categories of medium and low adoption with respect to adoption of dairy innovations.

Hiranjhan Kumar (1979). reported that the extent of use of dairy management practices was moderate to low in case of all farmers in general and small farmers in particular.

Avanti (1989) reported that among 12 improved practices of dairying, only one i.e., colostrum feeding was followed by all, whereas majority of the farmers adopted the practices like artificial insemination, drying period of pregnant cows and vaccination.

Association of the personal and socio-psychological characteristics with the extent of adoption.

Age and adoption:-

Byan and Gross (1950) in their study of acceptance and diffusion, reported that age was not associated with the adoption of recommended practices.

Gelman (1951) reported that there was no significant relationship between age and adoption.

Shankaraiiah (1965) in his study on differential characteristics of farmers and factors associated with adoption, reported that age has no influence on the adoption behaviour of the farmers.

Rai (1967) in his study on farmers' response to an improved farm practice, reported that there was no significant relationship between age and adoption.

Kittur (1976) in his study on adoption behaviour of marginal farmers, reported that adoption was not significantly associated with age.

Ragheendra (1979) found that there was no association between age and adoption of recommended dairy practices. This finding was confirmed in the studies conducted by Munda (1976) and Kappe (1976).

Avanti (1981) indicated that there was no significant association between the age group of dairy farmers and their adoption of improved dairy practices.

However, many studies cited below revealed that the age of farmers was associated with the adoption of recommended practices. These studies were:- Wilson and Gallup (1955), Jalilul (1960), Lieberman (1960), Dube (1961), Reddy (1962), Binait (1964), Pandit (1964), Chaudary (1967), Kaddy (1968) and Dudhani (1969).

From the foregoing reviews it is observed that most of the studies have indicated non-significant association between age and adoption behaviour of farmers. But a few studies have shown a positive relationship. So it would be interesting to study the relationship between the age and adoption behaviour of dairy farmers.

Education and adoption:

Salunki (1968), Veerbhadrach (1969), Veerbhadrach and Dwariknath (1970), Singh (1974) and Kattalan (1979) reported that there was no association between the educational level of farmers and their adoption of improved practices.

A number of studies reported in the past indicated a positive relationship between education and adoption. [Ryan and Gross (1950), Wilson and Gallup (1955), Jalilul (1960), Lieberman (1960), Jha (1972), Pandit (1980) and Awasthi (1981)].⁷

It is, therefore, desirable to investigate the relationship between the educational level of the dairy farmers and their extent of adoption of dairy management practices.

Land holding and adoption:

Gross (1949) reported that the acceptance of new ideas had large

Vanden Ban (1957) in his study found that the progressive farmers had bigger farms.

Jalihal (1960) after a review of large number of researches, concluded that farmers having larger land holdings adopted greater number of practices.

A number of studies conducted in the past have shown that farm size was significantly associated with the adoption of improved farm practices. (Pandit (1964), Shankaraya (1965), Patel (1977), Reddy (1968), Reddy (1971), Kolte (1973), Desai (1975), Siddalingappa (1978) Rattalah (1979) and Pansadi (1980).)

Singh (1979) in his study on multivariate analysis of adoption behaviour, found that farm size was significantly associated with the extent of adoption of farm practices.

The studies conducted exclusively on dairy farmers have also supported this finding.

Benarji (1976) in his study on evaluation of intensive cattle development, found that there was an association between land holdings and adoption.

Gupta (1976) in his study on differential motivation of dairy farmers, reported that adoption was associated with the land holdings.

Handal (1976) found that farm size was significantly associated with the adoption of improved dairy practices.

Raghavendra (1979) reported that there is no association between land holding and adoption of improved dairy practices.

Sohi and Kherde (1980) in their study on dairy adoption by small farmers and marginal farmers, found that there was significant relationship between adoption and land size.

Avanti (1981) indicated that there was no significant association between land holding status and adoption behaviour.

Livestock position and adoption:

Ray *et al.* (1960) in their study, found that livestock possession index of farmers was positively and significantly related to adoption of farm practices.

Chouhan *et al.* (1973), Ramaleo (1973), Kastiana (1973), Govindappa (1974), Gangappa (1975), Kittur (1976) and Mahadevaswamy (1978) indirectly reported from their studies that the livestock position is significantly associated with the extent of adoption of dairy management practices.

Herd size and adoption:

Sinha *et al.* (1974) reported that there was no association between herd size and adoption.

Benerji (1976), Handal (1976) and Kumar (1976) reported that herd size was significantly associated with the level of adoption of dairy innovations by the respondents.

Kappas (1976) found that herd size and family size were significantly associated with the adoption of dairy management practices.

Singh *et al.* (1978) reported that there was no significant relationship between herd size and adoption.

Raghavendra (1979) in his study, reported that the herd size was associated with the adoption behaviour of dairy farmers.

Sohi and Kherde (1980) in their study on adoption behaviour of small farmers and marginal farmers, reported that herd size was significantly associated with adoption behaviour of dairy farmers.

Credit utilization and adoption:

Ranganatha (1975) in a case study on the characteristics of the farmers covered by credit programmes of a commercial bank, found that there was no association between the credit users and their adoption.

Raschiappan (1975) noticed that small farmer borrowers had higher level of adoption of dairy practices compared to small farmer non-borrowers.

Srinivasamurthy (1977) noticed that both small farmer members of the Farmers Service Society and other farmer members had medium to high adoption level and they did not differ significantly in their adoption level.

Puttaswamy (1977) found that the small farmer borrowers had higher level of adoption in dairy enterprise than the small farmer non-borrowers.

Reddy (1980) in his study, pointed out that there was an association between credit use and the adoption level.

Organisational participation and adoption:

Veerbhadrach (1970) in his study on adoption of hybrid maize, found that organisational participation was associated with the adoption level of farmers.

Venkatramach (1971) reported that there was significant association between organisational participation and adoption. This findings was reinforced by the studies conducted by Eyre Kaddy (1971), Desai (1975), Gangappa (1975), Siddalingappa (1978) and Sahi and Kherke (1980).

Kittur (1976) in his study on adoption behaviour of marginal farmers, reported that there was no significant relationship between organisational participation and the adoption behaviour.

Reddy (1971) reported that organisational participation was not significantly associated with the adoption behaviour of farmers.

Panadi (1980) in his study on adoption behaviour of groundnut growers, found that there was significant relationship between organisational participation and the adoption level of farmers.

Avanti (1981) in his study on adoption behaviour of dairy farmers, reported that there was no association between adoption and organisational participation of the farmers.

Mass media participation and adoption:

Gross (1949) studying the differential characteristics of adopters pointed out that mass media participation was significantly

Marsh and Coleman (1955), reported, in his study on the relation of farmers characteristics with adoption, that mass-media participation was associated with adoption.

The studies of Rai (1967), Laxminarayan (1970), Byra Reddy (1971), Desai (1975), Demerji (1976), Hundal (1976), Kitter (1976), Siani *et al.* (1977), Sohi and Kherda (1980) and Awanti (1981) also indicated that there was significant association between mass-media participation and the adoption behaviour.

Ginba and Kholte (1974) reported that there was no significant association between mass-media participation and adoption. Similar finding was reported by Halappanavar (1979).

Cosmopolitanism and adoption:

Ryan and Gross (1943) reported that there was a significant relationship between extent of cosmopolitanism of farmers and their adoption of different farm practices.

Monberger (1957) in his study on social structure and diffusion of farm innovation, found that there was significant association between cosmopolitanism and adoption.

Emery and Omer (1958) pointed out that there was a significant relationship between cosmopolitanism and adoption. The studies of Rogers (1962), Foster (1956), Gangappa (1975), Hundal (1976), Kumar (1976), Singh *et al.* (1977) and Panadi (1980) have all pointed out a significant association between cosmopolitanism and the adoption behaviour of farmers.

Extension contact and adoption:

Wilson and Gallup (1955) reported that there was significant relationship between extension agency contact and adoption of farm practices.

Lionberger (1957) pointed out that there was association between extension agency contact and adoption of improved farm practices.

Roger (1961), Dalival and Sheel (1965), Thakur (1966), Jha (1975), Veerabharath (1975), N. R. Reddy (1974), P. S. S. (1975), Banerji (1976), Mandal (1976), Siami (1977), Jha and Kherde (1980) and Torral (1985) also reported that there was significant association between extension contact and adoption.

Extension participation and adoption:

Several studies have been reported on the extension participation and its relationship with adoption behaviour. The studies made by Wilson and Gallup (1955), Marsh and Coleman (1955), Lionberger (1957), Conynonour (1960), Rogers (1962), Dalival (1965), Jha and Singh (1966), Jha and Shakvet (1972), Somanthkarappa (1972), Veerabharath (1973), N. R. Reddy (1974), Gangappa (1975), Mandal (1976), Kistur (1976), Singh (1978), Siddalingappa (1978), Ravi Kumar (1979), Ponnadi (1980) and Torral (1985) reported a significant relationship between the extension participation and adoption of farm practices.

While the studies made by Ganesh (1976), Malayyanavar (1976) and Swanti (1981) were in contrary to the above findings.

Economic motivation and adoption:

Supé (1969) stated that economic motivation is the occupational success measured in terms of profit maximisation and the relative value placed by an individual on economic ends.

Dhanokar (1970) stated that the individual who is economically motivated may have a fair knowledge about new farm innovations.

Ranganathan and Jayashankar (1976) reported that the economic motive and profitability played the most dominant role in the adoption of cross-bred dairy cattle.

Reddy (1975) indicated that economic motive was at the top and dominance motive at the base among the farmers both in progressive and non-progressive villages.

Singh *et al.* (1975) reported that economic motives influence the farmers to modernize their farms.

Information sources consulted by farmers:

Kelsey and Hearne (1940) showed in their studies that people who had personal contacts with county agents accepted improved farm practices four times more than the people who had no such contact.

Wilkening (1950) found that mass media were the major sources of information for farmers.

Dabe (1955) found that the main source of information for improved practices were village level worker, agriculture extension officer, neighbours, relatives and persons in nearby villages.

Grey (1956) observed that radio farm programmes, farm magazines, newspapers, agriculture agencies, neighbours and relatives were the main sources of farm information.

Pandit (1962) found that the highest percent of farmers obtained farm information from the village level workers followed by neighbours and meeting in the villages.

Wilkering (1962) found that farmers of upper socio-economic levels mentioned agriculture agencies ^{as} most frequently contacted sources, while those of lower socio-economic levels mentioned other farmers and dealers as their sources of information.

According to Bose (1965) farmers came to know about innovations from the progressive farmer, who belonged to their own caste and from other experienced farmers.

Jha and Singh (1966) reported that demonstration, exhibitions, filmshows and other media were appreciably utilized by illiterate and less educated farmers for receiving farm information.

Jha (1966) found that village level worker was the most important source among the institutionalized sources, followed by Agriculture College, Agriculture extension supervisors and Block development officer. The other institutionalized sources were mentioned by very few persons. Taking all the sources together, the three most important sources, in order of preference, were demonstration, neighbours and village level worker.

Sinha and Prasad (1966) in their study, observed that village level workers have been worked quite effectively but the role of Agriculture extension officer and Block Development Officer as the source of information was negligible. They also noted that co-operatives and panchayats have also not played any important role in disseminating the information regarding the new technology.

Lakshmana and Sathyanarayanshi (1967) found that neighbours, village leaders and commercial agents were the important sources of information in the adoption of improved practices.

Sawhney (1967) reported that with the increase in farm size and income among farmers, there was a tendency of increased use of cosmopolite sources and decreased use of personal localite sources of information.

Sathyanarayana (1967) stated that those with large and medium sized land holdings and livestock units utilised the institutionalised sources to a greater extent than others. Farmer who had small land holdings and livestock units had used non-institutionalised sources to a greater extent in the awareness stages.

Rao (1968) observed that Government agencies was the most utilised channel of communication at awareness and adoption stage for all the practices under study, except in case of rearing of improved breeds of animals, in which neighbourhood was the most utilised source of information.

Sisodia (1968) found that the Government agencies, panchayat members and the family members were the main sources of information about new ideas.

Dadhani and Rao (1969) pointed out that in Dharwad district of Karnataka State, Grama Sevak was considered as the most common source of information followed by village leaders, neighbours, extension officer, block development officer, friends and relatives in the descending order.

Suryanarayamurthy (1970) reported that low competency level sources such as neighbours, relatives, friends were most utilised by small farmers than sources of higher competency level, as observed in Guntur district of Andhra Pradesh.

Veerbhadrarao and Rao (1971) found that formal and informal sources were almost equally consulted by farmers, Mass media sources were consulted to a very little extent. Grama Sevak, among the formal sources, was the most consulted source of information.

Avatiger (1974) found that majority of the small farmers preferred Grama Sevak, in order of preference among formal sources, followed by Agriculture Extension Officer and Secretary of Joint farming society. Among other information sources, progressive farmers were consulted to a large extent followed by local leaders and fertiliser dealers.

Govindappa (1974) identified in Bangalore district of Karnataka that a higher percent of small farmers adopting dairy have low extension contact, low media participation and low participation in extension activities.

Channe Gowda et al. (1975) reported that 62.2 percent of dairy farmers in Devanahalli taluk have consulted formal sources of information, whereas 37.8 percent had consulted informal sources.

Masiraja (1975) observed that majority of the small farmers had medium extension participation and less contact with Grama Sevak. They did not participate much in cattle show, exhibition, farm radio programme listening and about 16 percent of small farmers did not participate in any extension activities at all.

Ranganathan and Jayashankar (1975) observed that neighbours, friends and Milk Producer's Co-operative society personnel were utilized by all the dairy farmers.

Dwarkanath et al. (1976) reported that participants in "marginal farmer and agriculture labour" agency used village level workers, friends, officials of the co-operative society, Grama Sevak, Agriculture Extension Officer, Animal Husbandary Extension Officer to become aware, to develop interest and to decide in obtaining loan from the agency.

Mahadevaswamy (1978) revealed that Grama Sevak was the most consulted source of information by all the small, marginal and other dairy farmers.

Savant et al. (1979) reported that 32.3 percent of dairy farmers consulted opinion leaders for dairy information, 21 percent contacted Veterinary Officer, 14 percent consulted neighbours, followed by institutional sources like Agriculture Colleges and Universities.

Panadi (1980) observed that the village level worker was the first and foremost consulted source of information, followed by neighbours, radio, extension guide and other sources like newspaper, friends, relatives, progressive farmers and demonstrations etc., The least consulted sources were magazines, fertiliser agency and specialists of the university.

Gokal raj (1982) reported that 85.7 percent of the rural farmers assigned first rank to the neighbours and 82 percent assigned second rank to friends. As regarding the big farmers 53.1 percent attributed first rank to neighbours and 45.5 percent indicated friends as second preferred source of farm information.

Kather kan et al. (1983) reported that Government agency, in general extension officer (A.H.) and co-operative milk society, in particular happened to be the effective sources for providing information regarding all dairy practices in both awareness and adoption.

Kullaji Reddy (1983) reported that Grama Sevak was the most consulted source followed by progressive farmers, neighbours, village leaders, radio, magazines, demonstration and other sources.

Economics of dairying

Naachiappan (1973) reported that the participant small farmers of integrated area development scheme obtained low income than the non-participants, even though they were provided with quality breeds of animals under the scheme.

Sardival (1974) reported that cost of production per litre of milk was Rs.1.75 and maintenance cost per cow was Rs. 4.48.

Garg and Asad (1975) worked out the cost and returns from a cross-bred cow per lactation and revealed that the net cost during lactation period of 390 days was Rs. 3,613.76 and the cost of production per litre of milk was Rs. 1.01.

Parkale et al. (1975) In their study showed that annual gross income per cow amounted to Rs. 2,238.05 and per litre net cost and net income of milk production were Rs. 1.52 and Rs. 0.30, respectively.

Parthasarathy (1975) in his analysis revealed that the cost of production for a litre of milk was Rs. 1.48 and the net return per animal per lactation was Rs. 1,038.00.

Brivastava and Singh (1975) revealed that the net maintenance cost during the intercalving period to the cow was Rs. 1,079.46 and the cost of production per litre was Rs. 1.64.

Thakur (1975) reported that the total marketed surplus milk was higher in case of landless and small farmers, as compared to medium and large farmers.

Swaminathan et al. (1978) reported that net income per annum was Rs. 179.07 and the cost of production per litre was Rs.0.91.

Chidanbaram (1979) reported that maintenance cost per cow was Rs. 1,286.86 and the cost of milk production per litre was Rs.0.87.

Agarsh (1979) reported that the cost of production per animal was Rs. 2,521.75 and the total return per litre was Rs. 1.48.

Rao and Singh (1980) came out with a finding that the net income per cow excluding family labour ranged from Rs. 605 to 1,140 per lactation period.

Singh and Singh (1981) in their study on economic performance of different species of milch animals among the small farmers, marginal farmers and large farmers, came out with the findings that net income per year per animal was around Rs. 712/-.

Brahm Choudary (1983) In the study conducted on cross-bred cows production economics found that net profit per lactation per cow was Rs. 4,260/- and cost of production per litre was Rs. 1.60.

Problems in adopting dairy management practices:

Govindappa (1974) reported that the reasons for non-adoption of improved dairy practices were financial limitations, high cost of cattle feed, lack of housing facilities and lack of knowledge.

Hashippan (1975) observed that lack of knowledge about improved dairy practices was the reason identified by majority of small farmers.

Aswath Kumar (1977) indicated that the reasons for non-adoption of improved practices by dairy farmers were lack of knowledge, lack of capital and lack of resources.

Pattaswamy (1977) found that the reasons for low adoption in dairy enterprises were financial problem, higher cost, lack of knowledge and housing problems.

Srinivasamurthy (1977) noticed that reasons like high price

MATERIAL AND METHODS

III. MATERIAL AND METHODS

This chapter deals with material and methods used in conducting of the study. The information is presented under the following headings.

1. Locals of the study
2. Selection of villages and respondents
3. Empirical measurement of variables
4. Techniques of field data collection
5. Statistical methods used for analysis.

Locals of the study

The study was conducted in one of the purposively selected taluks of Bangalore district. It was felt essential to select a taluk which has a large number of dairy farmers. Hence, the milk production of all taluks of Bangalore district was considered and the taluk which had produced the highest quantity of milk was selected for the purpose of the present study. The taluk thus selected was Devanahalli, which had recorded 1 lakh litres of dairy milk production per day during 1954.

According to 1951 census, the taluk consists of 279 villages, with a total population of 1,59,500. There are 46 milk producers' co-operative societies in Devanahalli taluk, with an average membership of 250 members per society. The taluk is, therefore, said to have over 11,500 dairy farmers, who supply milk to dairy co-operative societies.



Fig.1 MAP OF DEVANAHALLI TALUK

A veterinary hospital with a qualified veterinary doctor is situated at the taluk head quarters, Besides there are many veterinary dispensaries operating in the rural areas catering to the needs of dairy farmers.

Selection of villages and respondents

A list of all the villages in the taluk having more than 80 farm families and a milk producers' co-operative society was prepared. From this list, eight villages were randomly selected for the purpose of this study. The villages thus selected are as follows.

- | | |
|-----------------|-------------------|
| 1. Avathi | 5. Ganga Vana |
| 2. Beersandra | 6. Kurala Gurki |
| 3. Betta ulsoor | 7. Savakanahalli |
| 4. Chieka Jala | 8. Vishwanathpara |

A list of all the dairy farmers in these selected villages was prepared and from this list 15 respondents were selected in each village on random basis. Thus, the total size of the sample was 120.

Empirical measurement of variables

In the present study, adoption was taken as the dependent variable and the independent variables considered were: age, education, size of land holding, livestock position, herd size, use of credit facilities, organisational participation, level of aspiration, cosmopolitanness, economic motivation, mass media participation, extension contact, extension participation and awareness about dairying.

Measurement of dependent variable

The dependent variable i.e., the adoption of improved dairy management practices was measured quantitatively by using the adoption scale developed by Sengupta (1967).

The weightages were assigned for each of the 13 dairy practices considered, depending upon their importance. In case of some practices the correct adoption of practice was credited with two scores, partial adoption with one score and non-adoption with zero score. In case of certain other practices the adoption was measured on two point continuum i.e., adoption or non-adoption by giving one score for adoption and zero score for non-adoption.

The list of selected improved dairy management practices alongwith weightages is given below.

Selected dairy management practices and the weightages given

1. Rearing of improved breeds		
- Cross-Bred cows		1
- Local cows		0
2. Feeding of dry fodder		
- Recommended quantity		2
- Less than recommended quantity		1
- Not practicing		0
3. Feeding of Green fodder		
- Recommended quantity		2
- Less than recommended quantity		1

4. Use of feed concentrates		
- Recommended quantity		2
- Less than recommended quantity		1
- Not practicing		0
5. Artificial insemination		
- Practicing		1
- Not practicing		0
6. Naval cord sealing		
- Practicing		1
- Not practicing		0
7. Vaccination of animals		
- Practicing		1
- Not practicing		0
8. Dehorning of calves		
- Practiced at recommended time		2
- Practiced but not at recommended time		1
- Not practicing		0
9. Cow-Dung utilisation		
- For Bio-Gas/Manure		1
- For fuel purpose		0
10. Method of milking		
- Recommended type		1
- Not recommended type		0

11. Sanitation measures

- Adopting all the practices	2
- Adopting 1 to 2 practices	1
- Not adopting any practice	0

12. Animal Insurance

- Practising	1
- Not practising	0

13. Record Keeping

- Practising	1
- Not practising	0

The maximum possible adoption score were 18 in the present study.

Based on the quantified adoption level, the respondents were grouped into three categories using mean adoption score $\bar{x} \pm 1$ S.D. as central point of check. The categories thus arrived at are as follows.

<u>Sl.No.</u>	<u>Extent of adoption</u>	<u>Criterion scores</u>
1.	Low	Less than 11
2.	Medium	11 to 14
3.	High	More than 14

Measurement of independent Variables

The measurement of the independent variables selected for the study was done on the following lines.

- a) Age- This was taken as the number of years completed by the respondent on the day of data collection. The classification of

<u>Sl.No.</u>	<u>Age groups</u>	<u>Criteria</u>
1.	Young	Below 31 years
2.	Middle aged	31 to 45 years
3.	Old	Above 45 years

b) Education- This was considered as the amount of formal schooling the respondent has obtained. The respondents were classified into three categories as follows.

<u>Sl.No.</u>	<u>Educational level</u>
1.	Illiterates
2.	Middle school educated
3.	High school and College educated.

c) Size of land holdings- This variable was measured in terms of number of acres of land owned by the respondents. The farmers were classified into two groups as indicated below.

<u>Sl.No.</u>	<u>Size of the land holding</u>	<u>Criteria</u>
1.	Small	Less than 5 acres
2.	Large	More than 5 acres

d) Livestock positions- The position of the livestock was assessed by giving scores as detailed below.

<u>Type and Number of animal owned</u>	<u>Scores assigned</u>
For each cross bred cow/buffaloe	2
For each local cow/buffaloe	1
For each pair of draught animal	1
For every 10 sheep/goats	1

Based on the scores obtained by the respondents, they were categorised into 3 groups.

<u>Sl.No.</u>	<u>Livestock position</u>	<u>Criterion Scores</u>
1.	Low	Below 6
2.	Medium	6 to 10
3.	High	Above 10

e) Herd Size:- This variable was measured by the number of milch cows/buffaloes owned by the farmers. The categorisation was done as follows,

<u>Sl.No.</u>	<u>Herd size</u>	<u>Criteria</u>
1.	Small	Less than 2 milch cows/buffaloes
2.	Large	More than 2 milch cows/buffaloes

f) Use of Credit facilities:- It is the utilization of credit made by the farmers from the different institutional sources. The respondents were classified into two groups viz. borrowers and non-borrowers.

g) Organization participation:- This refers to the degree of involvement of the respondents from mere membership to his active participation in the activities of local formal organization, like village panchayat, dairy co-operative societies, farmers forum and land development bank etc., The items and weightages used were as under.

<u>Items</u>	<u>Markings assigned</u>
Member in any one of the organisations	1
Not a member in any one of the organisations	0
If member, attends the meeting of the organisation	
- Regularly	2
- Occasionally	1
- Never	0

The respondents were classified into two groups on the basis of the mean scores obtained by them.

<u>Sl.No.</u>	<u>Organization participation</u>	<u>Criterion Score</u>
1.	Low	Mean and below (4 and below)
2.	High	Above mean (More than 4)

b) Commonality- It is considered as the degree to which the individual has contact outside the community like visiting to Indo-Danish Project, Bangalore dairy, National Dairy Development Research Institute, Karnataka Dairy Development Corporation, Animal Husbandary Departments, Veterinary College and other private dairies. The score was given based upon the number of visits made by the respondents during the last one year.

<u>Items</u>	<u>Scores assigned</u>
Visited more than 10 times	2
Visited one to ten times	1
Not visited	0

The respondents were classified into two groups based on mean scores.

<u>Sl.No.</u>	<u>Cosmopolitness</u>	<u>Criterion scores</u>
1.	Low	Mean and below (1 and less)
2.	High	Above mean (more than 1)

1) Economic motivation:- To measure this variable, a list of motivational factors/statements was prepared and used (Appendix 1). The list of statements contained both positive and negative statements. The weights were given on the 3 point continuum scale.

<u>Items/statements</u>	<u>Scores</u>
For positive statements	
Agree	2
Undecided	1
Dis-agree	0
For negative statements	
Agree	2
Undecided	1
Dis-agree	0

The respondents were classified into two groups on the basis of their economic motivation.

<u>Sl.No.</u>	<u>Economic motivation</u>	<u>Criterion scores</u>
1.	Low	Mean and below (7 and less)
2.	High	Above mean (more than 7)

j) Mass media participation:- In order to assess the extent of participation of the respondents in the mass media, different mass media were listed and the respondents were asked to indicate as how often they participate in each of these. Regular participation in each source was assigned with two scores, occasional participation with one score and non-participation zero score.

The respondents were classified into two groups based upon their extent of participation.

<u>Sl.No.</u>	<u>Mass media participation</u>	<u>Criterion score</u>
1.	Low	Mean and below (4 and less)
2.	High	Above mean (more than 4)

k) Level of aspiration:- This was measured by using a scale consisting of 3 items namely, the type of occupation desired for the son, number of times the dairy was intended to be extended and the number of times the farm income was proposed to be increased. The scoring procedure followed is detailed below.

<u>Items</u>	<u>Scores given</u>
<u>Type of occupation desired for the son</u>	
- Agriculture	1
- Government job	2
<u>Number of times the farmer wants to increase the size of his dairy</u>	
- One time	1
- More than two times	2

The respondents were classified into 2 groups based on the mean scores obtained by them.

<u>Sl.No.</u>	<u>Level of aspiration</u>	<u>Scores</u>
1.	Low	Mean and below (4 and less)
2.	High	Above mean (more than 4)

1) Extension contact:- It is the degree to which the respondent had contact with the extension agency like agriculture assistant, village extension officer, veterinary doctor, livestock inspector and others. The scores were given based upon the frequency of contact by the respondent.

<u>Frequency of contact</u>	<u>Scores</u>
Many times in a crop season	2
Once in a crop season	1
Never contact	0

The respondents were classified into three groups, on the basis of the following criteria.

<u>Sl.No.</u>	<u>Extension contact</u>	<u>Criteria scores</u>
1.	Low	Less than 2
2.	Medium	2 to 4
3.	High	More than 4

a) Extension participation- It refers to the participation of the respondent in different extension methods like extension meeting, exhibition field day, cattle fair, campaign and film shows relating to dairying. The scores were given on the two point continuum for each extension method in which the farmer has participated.

The respondents were classified into two groups, based upon their participation.

<u>Sl.No.</u>	<u>Extension participation</u>	<u>Criterion score</u>
1.	Low	Mean and below (2 and less)
2.	High	Above mean (more than 2)

a) Awareness about dairying- It is the extent to which the respondent is knowledgeable about the different aspects of dairying like cross-bred, cows, trade names of the feeds, Dairy Development centres and some of the major disease of dairy animals. The respondents awareness of each item was measured as follows.

<u>Item</u>	<u>Score</u>
Aware of two or more names	2
Aware of one name	1
Do not know	0

The total scores obtained by each respondent were calculated and classified into two groups.

<u>Sl.No.</u>	<u>Awareness about dairying</u>	<u>Criterion score</u>
1.	Low	Mean and below (5 and less)

Information sources consulted:

In order to know which information sources play a dominant role in diffusing innovations relating to the dairy, a list of information sources was prepared and the respondents were asked to mention the information sources they consult for getting specific information on dairy management practices. The list of information sources selected for the study is given in Appendix I.

Economics of Dairying:

The two aspects studied relating to the economics of dairying were cost of production and the net returns obtained by farmer from dairy enterprises. The cost of production was worked out by considering the cost involved in feeding, labour, medical expenses, transportation, insurance paid etc., excluding the initial investment like fixed cost on cattle shed, animals etc.,. The returns per animal per day was worked out taking into consideration the production of milk and the dung. The net returns is the income derived by deducting the cost of production from the total returns.

Problems involved in Dairying:

To know the major problem hindering the adoption of improved dairy practices among different categories of farmer, a list of 8 problems was prepared. In order to know which of these 8 problems are most commonly faced by the dairy farmers, the respondents were asked to rank these problems. The problem which was ranked first was given a score of 8, second with a score of 7, third with a score of

Techniques of field data collection:

A structured interview schedule was prepared for data collection. The schedule was pre-tested with similar respondents before its use in the main dairy. The standardised interview schedule is given in Appendix -I.

Before collection of data in the sample villages, few preliminary visits were made along with the extension guide in order to establish rapport with the farmers. The purpose of the study was explained to the respondents in the first visit. This helped the investigator to have a friendly relationship with farmers and gain their confidence. The subsequent visits were made to collect data from the respondents by interviewing them personally, with the help of schedule.

Analysis of Data

The Chi-square test, ranking method and percentages were used for analysis of the data. The Chi-square test was used to find out the association between the adoption of dairy management practices and the various independent variables such as age, education, land holding, livestock position, herd size, credit utilisation, social participation, level of aspiration, cosmopolitanism, economic motivation, mass media participation, extension contact, extension participation and awareness about dairying. The chi-square test was conducted with the minimum expected frequency with not less than two in any cell as recommended by Cochran. (1954)

Hypotheses set for the study

The following hypotheses on the relationship between the dependent and independent variables were developed and tested in the light of the data collected in the present investigation.

1. There is no significant association between the age and the extent of adoption of improved dairy practices by the farmers.
2. There is no significant association between the education and the extent of adoption of improved dairy practices by the farmers.
3. There is no significant association between the size of land holding and the extent of adoption of improved dairy practices by the farmers.
4. There is no significant association between the livestock position and the extent of adoption improved dairy practices by the farmers.
5. There is no significant association between the herd size owned and the extent of adoption of improved dairy practices by the farmers.
6. There is no significant association between the Credit utilization and the extent of adoption of improved dairy practices by the farmers.
7. There is no significant association between the organizational participation and the extent of adoption of improved dairy practices by the farmers.

8. There is no significant association between the cosmopolitanness and the extent of adoption of improved dairy practices by the farmers.
9. There is no significant association between the economic motivation and the extent of adoption of improved dairy practices by the farmers.
10. There is no significant association between the mass media participation and the extent of adoption of improved dairy practices by the farmers.
11. There is no significant association between the level of aspiration and the extent of adoption of improved dairy practices by the farmers.
12. There is no significant association between the extension contact and the extent of adoption of improved dairy practices by the farmers.
13. There is no significant association between the extension participation and the extent of adoption of improved dairy practices by the farmers.
14. There is no significant association between the awareness and the extent of adoption of improved dairy practices by the farmers.

RESULTS

IV. RESULTS

The findings of the present investigation are reported in this chapter under the following headings.

1. Extent of adoption of improved dairy management practices.
2. Association between various characteristics of farmers and their extent of adoption.
3. Information sources consulted by dairy farmers.
4. Economics of dairy enterprise.
5. Problems involved in adopting dairy management practices.

Extent of adoption of improved dairy management practices

The results reported under this heading relate to the overall adoption level of the respondents and the adoption of 15 improved dairy management practices considered individually.

Overall adoption level

Table-1 presents the data on overall adoption level of the respondents. As it could be observed from the table, majority of the farmers (63.4%) belong to medium level of adoption with an average adoption quotient of 55.77. About one-fourth of the farmers were in low adoption category and their adoption quotient was as low as 37.86. Only 10.8 percent of the farmers belonged to high adoption group, whose adoption quotient was 60.86.

Table-1. Classification of respondents based on their extent of adoption of improved dairy management practices.

(N = 120)

Sl.No.	Overall adoption level	Average adoption quotient	No. of Farmers	% of Farmers
1.	Low	37.86	31	25.8
2.	Medium	55.77	76	63.4
3.	High	66.86	13	10.8
Total			120	100.0

Extent of adoption of different dairy management practices.

Cross-bred cows: The data regarding the adoption of improved breeds by the respondents has been given in Table-2. It was found that as high as 89.17 percent of the farmers had adopted improved breeds, while 10.83 percent of the farmers continued to keep the local breeds.

Among the farmers who were having cross-bred cows, Holstein breed was owned by 60 percent of the farmers, Jersey by 48.33 percent and Red-Dane by 21.67 percent.

Dry fodder: It is evident from the Table-3 that 85.0 percent of the farmers adopted recommended level of dry fodder, while 12.5 percent of farmers used less than recommended quantity and 2.5 percent farmers never used dry fodder at all.

Green fodder: Table-3 also points out the adoption level of green fodder by the respondents. It could be seen that only 58.33 percent farmers were using recommended level of green fodder, whereas 19.17 percent farmers used less than recommended quantity of green fodder and 22.5 percent of farmers never used the green fodder.

Feed concentrates: It could be observed from Table-3 that 62.5 percent of farmers adopted recommended quantity of feed concentrates, and 36.7 percent farmers adopted less than recommended quantity. It was only 0.8 percent who never used feed concentrates.

Artificial insemination: It was evident from the Table-4 that 89.17 percent of farmers were practicing artificial insemination and remaining 10.83 percent were not practicing artificial insemination.

Vaccinations: It was seen that only 22.5 percent of farmers were not practicing vaccination, while 77.5 percent were getting their animals vaccinated (Table-4).

Sanitation: Table-4 also depicts the data regarding sanitation measure adopted by the farmers. It was encouraging to note that 100 percent of farmers were practicing sanitation.

Navel cord sealing: Out of 120 dairy farmers interviewed, no one was practicing navel cord sealing (Table-5).

Dehorning: Table-5 also indicate that 45.3 percent of the farmers were following dehorning practice at the proper time, while 40.0 percent of farmers were not at all practicing dehorning of younger animals. About 16 percent farmers were practicing this method at a later period.

Milking: It was observed from Table-5 that 75.0 percent farmers were not practicing full hand milking. It was only 25.0 percent farmers who were practicing full hand milking.

Animal insurance: It is evident from Table-6 that 44.17 percent farmers insured their animals, while 55.83 percent farmers did not insure their animals.

Record maintenance: The data regarding the record maintenance has been given in Table-6. It was found that only 5.83 percent respondents were maintaining records, while as high as 94.17 percent of the respondents were not maintaining any records.

Table 2. Extent of adoption of cross-bred cows by dairy farmers.

(N = 120)		
Type of the breed	Number of farming couple	percent of farmers
Local	13	10.83
Cross-bred cows	107	89.17
Total	120	100.00

Names of the
cross-bred
cows used

Jersey	58	49.53
Holstein	72	60.00
Redburn	26	21.67
Total	156	130.00 *

* The percentage exceeds 100 since a farmer may own more than one type of breed.

Table -3. Extent of adoption of recommended quantity of roughages and feed concentrates.

(n = 120)		
Roughages and feed concentrates	Number of farmers adopting (n)	Percent of farmers adopting (%)
<u>Dry fodder</u>		
Recommended quantity	102	85.0
Less than recommended quantity	15	12.5
Do not use	3	2.5
Total	120	100.0
<u>Green fodder</u>		
Recommended quantity	70	58.33
Less than recommended quantity	25	19.17
Do not use	25	22.50
Total	120	100.00
<u>Feed concentrates</u>		
Recommended quantity	75	62.5
Less than recommended quantity	44	36.7
Do not use	1	0.8

Table -4. Extent of adoption of artificial insemination,
vaccination and sanitation measures.

Improved practice	Number of farmers adopting; (a)	Percent of farmers adopting (b)
Artificial Insemination		
Practising	107	89.17
Not practising	15	10.83
Total	120	100.00
Vaccination		
Practising	95	77.5
Not practising	27	22.5
Total	120	100.0
Sanitation		
Practising	120	100.0
Not practising	0	0
Total	120	100.0

Table - 3. Extent of adoption of Navel cord sealing, dehairing and improved method of milking.

(N = 120)

Improved practice	Number of farmers adopting (n)	Percent of farmers adopting (%)
<u>Navel cord sealing</u>		
Practicing	0	0
Not practicing	120	100.0
Total	120	100.0
<u>Dehairing</u>		
Practicing at proper time	52	43.3
Practicing at a later period	20	16.7
Not practicing	48	40.0
Total	120	100.0
<u>Improved method of milking</u>		
Practicing	30	25.0
Not practicing	90	75.0

Table -6. Extent of adoption of animal insurance, record maintenance and dung utilization.

(N = 120)		
Improved practice	Number of farmers adopting (n)	Percent of farmers adopting (%)
<u>Animal insurance</u>		
Insured	53	44.17
Not insured	67	55.83
Total	120	100.00
<u>Record maintenance</u>		
Maintaining	7	5.83
Not maintaining	113	94.17
Total	120	100.00
<u>Dung utilization</u>		
For bio-gas production	5	4.17
As manure	115	95.83
Total	120	100.00

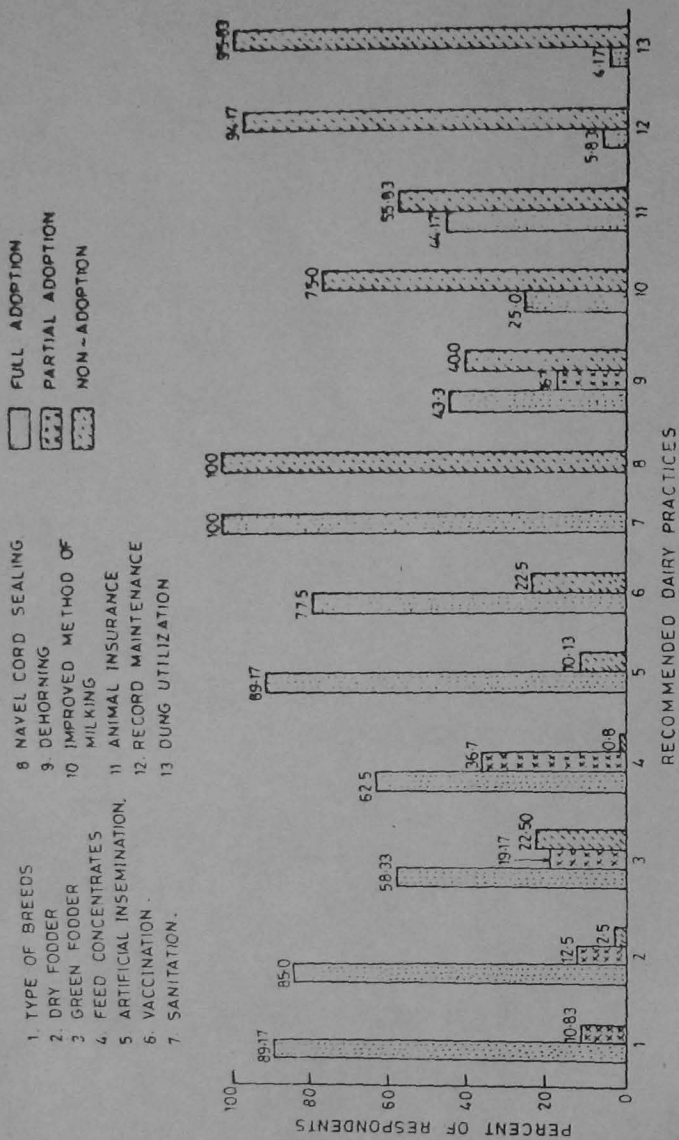


Fig.2 Extent of adoption of recommended practices by dairy farmers.

Dung utilization: The data regarding utilization of dung appears in Table-6. It is observed that only 4.17 percent farmers were utilizing the cow dung for bio-gas production, while 95.83 percent were using the dung directly for manurial purpose.

Association between various characteristics of farmers and their extent of adoption

The association between the extent of adoption of improved dairy management practices with various personal and socio-psychological characteristics of farmers has been studied and the results are presented below.

Age and adoption: The extent of adoption of improved dairy management practices among the farmers belonging to different age groups is presented in Table-7.

The results of the chi-square test applied on this set of data indicated non-significant results. Thus, there was no association between the age of the dairy farmers and their extent of adoption. The proportion of farmers in different adoption levels as indicated by marginal frequencies were equally applicable to all age groups. The percentages of farmers having low, medium and high adoption were observed to be 35.8, 29.2 and 35.0 respectively.

Education and adoption: The data in Table-8 relating to the extent of adoption and educational level of the farmers were subjected to chi-square test and the results were found to be non-significant. Thus, there was no association between educational level of dairy farmers and their extent of adoption of dairy management practices. The variations in proportion of adopters under the three educational levels were only due to chance occurrence.

Table -7. Extent of adoption among the farmers belonging to different age groups.

(N = 120)

Age Groups	Extent of adoption			Total
	Low	Medium	High	
Young	10 (32.25)	29 (38.15)	4 (30.77)	43 (35.8)
Middle	7 (22.58)	25 (32.90)	3 (23.08)	35 (29.2)
Old	14 (45.17)	22 (28.95)	6 (46.15)	42 (35.0)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 3.473 \text{ N.S.}$$

d.f. = 4

N.S. = Non significant

NOTE: - The figures in the ⁿ parentheses indicate the percentages.

Table - 8. Extent of adoption among the farmers belonging to different educational level*

(N = 120)

Educational level	Extent of adoption			Total
	Low	Medium	High	
Illiterates	15 (41.94)	17 (22.37)	3 (23.07)	35 (27.5)
Studied upto 7th standard	15 (41.94)	29 (36.84)	4 (30.77)	48 (37.5)
Studied beyond 7th standard	5 (16.12)	31 (40.79)	6 (46.16)	42 (53.0)
Total	35 (100)	76 (100)	13 (100)	120 (100)

$\chi^2 = 7.836$ N.S.

d.f. = 4

N.S. = Non significant

NOTE: - The figures in the p-brackets indicate the percentages.

Land holding and adoption: The result of the chi-square test applied for the data in Table-9 revealed that there was highly significant association between the size of land holding of dairy farmers and their adoption levels. The low adoption was associated with small holding, while high and medium level of adoption were observed among the farmers having larger holdings.

Livestock position and adoption: It could be observed from Table-10 that there was highly significant association between livestock position and the adoption level of dairy farmers. The data indicated that there was increase in the extent of adoption of improved dairy practices with the increase in the livestock position of the farmers.

Herd size and adoption: The data in Table-11 subjected to chi-square test revealed that there was highly significant association between herd size and the adoption of dairy management practices.

A large percentage of farmers who maintained small herd size had exhibited low level of adoption as it could be observed from the table.

Credit utilization and adoption: Table -12 presents the data on the extent of adoption of improved dairy practices among the borrowers and non-borrowers. The results of chi-square test indicated that there was no association between credit utilization and adoption of improved dairy management practices. The variation in the adoption of improved dairy management practices among the borrowers and non-borrowers of credit was more or less same.

Table-9. Extent of adoption among the farmers belonging to different land holding groups.

Land Holding	Extent of adoption			Total
	Low	Medium	High	
Small	25 (80.65)	35 (46.05)	4 (30.77)	64 (53.3)
Large	6 (19.35)	41 (53.55)	9 (69.23)	56 (46.7)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 13.568^{**}$$

$$d.f. = 2$$

** = Significant at 1 percent

NOTE :- The figures in the parentheses indicate the percentages.

Table-10. Extent of adoption among the farmers belonging to different livestock position group.

(n = 120)

Livestock position	Extent of Adoption			Total
	Low	Medium	High	
Small	30 (96.77)	45 (59.21)	7 (53.05)	82 (68.3)
Large	1 (3.23)	31 (40.79)	6 (46.15)	38 (31.7)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$\chi^2 = 15.76^{**}$

d.f. = 2

** = significant at 5%

NOTE:- The figures in the parantheses indicate the percentages.

Table-11. Extent of adoption among the farmers belonging to different herd size group.

(N = 120)

Herd size	Extent of adoption			Total
	Low	Medium	High	
Small	29 (90.32)	49 (64.47)	8 (61.54)	85 (70.83)
Large	3 (9.68)	27 (35.53)	5 (38.46)	35 (29.17)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 7.754^*$$

d.f. = 2

* = Significant at 5.

NOTE:- The figures in the parentheses indicate the percentages.

Table- 12. Extent of adoption among the borrowers and non borrowers dairy farmers.

Credit utilization	Extent of adoption			Total
	Low	Median	High	
Borrowers	17 (54.84)	51 (67.10)	10 (76.92)	78 (65.00)
Non-borrowers	14 (45.16)	25 (52.90)	3 (23.00)	42 (35.00)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 2.365^{ns}$$

d.f. = 2

P.S. = Non-significant

NOTE:- The figures in the parentheses indicate the percentages.

Organisational participation and adoption: The data relating organisational participation of dairy farmers and their adoption level is furnished in Table-13.

The chi-square test results were found to be non-significant. This indicated that there was no association between extent of organisational participation of farmers and their adoption of improved dairy management practices. The proportion of low, medium and high adopters was more or less similar among the farmers having low and high organisational participation.

Cooperativeness and adoption: It was observed from Table-14 that there was highly significant association between cooperativeness and the adoption of improved dairy management practices. A large percentage of low adopters (87.10 %) had exhibited low cooperative behaviour. The extent of adoption of improved dairy management practices increases steadily among the farmers having high cooperativeness, while in the case of low cooperative farmers the opposite was true.

Economic motivation and adoption: Table-15 reveals the findings on the economic motivation and the extent of adoption of improved dairy management practices. There was no association between economic motivation of dairy farmers and their adoption, as indicated by the chi-square test.

Mass media participation and adoption: Table-16 summarizes the information regarding mass media participation of dairy farmers and their adoption of improved dairy management practices. The chi-square

Table-13. Latent of adoption among the farmers belonging to different category of organisational participation.

($n = 120$)

Organisational participation	Latent of adoption			Total
	Low	Medium	High	
Low	24 (77.42)	42 (55.26)	8 (61.34)	74 (61.7)
High	7 (22.58)	34 (44.74)	5 (39.45)	46 (38.3)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$\chi^2 = 4.573$ N.S.

d.f. = 2

N.S. = non-significant

NOTE:- The figures in the parentheses indicate the percentages.

Table-14. Extent of adoption in relation to the cosmopolitanism of dairy farmers.

(N = 120)

Cosmopolitanism	Extent of adoption			Total
	Low	Median	High	
Low	27 (87.10)	47 (61.84)	7 (33.85)	81 (67.5)
High	4 (12.90)	29 (38.16)	6 (46.15)	39 (32.5)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 7.640^*$$

d.f. = 2

* = significant at 5 percent

NOTE:— The figures in the parentheses indicate the percentages.

Table-15. Extent of adoption in relation to the economic motivation of dairy farmers.

(N = 120)

Economic Motivation	Extent of adoption			Total
	Low	Medium	High	
Low	14 (45.16)	29 (39.46)	6 (46.15)	49 (40.83)
High	17 (54.84)	47 (61.84)	7 (53.65)	71 (59.17)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 0.619^{ns}$$

d.f. = 2

N.S. = non significant

NOTE:- The figures in the parentheses indicate the percentages.

Table-16. Extent of adoption in relation to the mass media participation of dairy farmers.

(N = 120)

Mass media participation	Extent of adoption			Total
	Low	Medium	High	
Low	26 (83.87)	33 (50.00)	6 (46.15)	70 (58.3)
High	5 (16.13)	38 (50.00)	7 (55.85)	50 (41.7)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 11.279^{**}$$

d.f. = 2

** = Significant at 1 percent

NOTE-- The figures in the parentheses indicate the percentages.

test conducted for the data of this table indicated highly significant results. This showed that there was an association between mass-media participation of the farmers and their extent of adoption. As high as 83.87 percent of low adopters had low mass-media participation, while a majority of high adopters (53.85 %) had high mass-media participation.

Level of aspiration and adoption: The data in Table-17 subjected to chi-square test revealed non-significant result. While 58.06 percent of low adopters had low level of aspiration, 41.54 percent had high level of aspiration. More or less similar pattern was observed among the farmers belonging to low and high level of adoption. This variation is only due to chance factor and not due to the differences in the level of aspiration of the respondents.

Extension agency contact and adoption: Table-18 reveals that there was highly significant association between extension agency contact and the extent of adoption. It was found that majority (41.94 %) of the low adopters had less contact with extension agency, whereas majority of the medium and high adopters had medium to high extension agency contact.

Extension participation and adoption: The data regarding extension participation and the adoption is provided in Table-19. The results of chi-square test revealed a highly significant association between the extension participation of farmers and their extent of adoption. Nearly three-fourths of low adopters had exhibited low extension participation, while an equal number of high adopters had shown high extension participation.

Table-17. Extent of adoption among the farmers having different levels of aspiration.

(N = 120)

Level of Aspiration	Extent of adoption			Total
	Low	Medium	High	
Low	18 (58.06)	46 (66.55)	7 (53.85)	71 (59.17)
High	13 (41.94)	30 (39.47)	6 (46.15)	49 (40.83)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$\chi^2 = 0.24$; *n.s.* d.f. = 2 N.S. = Non-significant

NOTE: The figures in the parentheses indicate the percentages.

Table-18. Extent of adoption in relation to extension agencies contact of the dairy farmers.

(N = 120)

Extension Agency Contact	Extent of adoption			Total
	Low	Medium	High	
Low	15 (41.94)	7 (9.21)	1 (7.70)	21 (17.5)
Medium	7 (22.58)	51 (40.79)	6 (46.15)	44 (36.7)
High	11 (35.48)	33 (50.00)	6 (46.15)	53 (45.0)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 20.122^{**}$$

d.f. = 4

** = Significant at 1 percent

NOTE:- The figures in the parentheses indicate the percentages.

Table-19. Extent of adoption in relation to the extension participation of farmers.

(N = 120)

Extension participation	Extent of adoption			Total
	Low	Medium	High	
Low	23 (74.19)	39 (51.32)	3 (23.00)	65 (54.17)
High	6 (23.81)	37 (48.69)	10 (76.92)	53 (45.83)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 10.314^{**}$$

$$d.f. = 2$$

** = Significant at 1 percent

NOTE:- The figures in the parentheses indicate the percentages.

Awareness and adoption: The extent of awareness about dairying and its association with the extent of adoption of dairy farmers is presented in Table-20.

It was observed that majority (80.65 %) of low adopters had less awareness about dairy management practices, while a majority of the medium and high adopters had high awareness. The chi-square test results indicated that there was highly significant association between awareness and adoption of improved dairy practices.

Information sources consulted by dairy farmers: Information sources are the individuals and institutions or agencies from where the dairy farmers obtain knowledge and technical know-how about the dairy management practices. To know which source is most consulted by the dairy farmers and for what purpose, it was necessary to study this variable in the study.

Table-21 depicts the data regarding the information sources consulted by the dairy farmers. It was evident from the table that majority (94%) of the farmers consulted veterinary doctor, followed by agricultural assistant (35%), livestock inspector (15%), fodder extension officer (13%) and village extension officer (10.83%). The other information sources consulted by less than 10 percent of farmers were veterinary hospital, Karnataka dairy development corporation, radio, filmshow, neighbours and friends, progressive farmers and village leaders.

Table-22 reveals the percentages of different adopter categories consulting different information sources for getting information on various aspects.

Table-20. Extent of adoption in relation to awareness about dairying of dairy farmers

(n = 120)

Awareness about dairying	Extent of adoption			Total
	Low	Medium	High	
Low	25 (20.83)	20 (16.67)	3 (2.50)	56 (46.7)
High	6 (5.00)	48 (40.00)	10 (8.33)	64 (53.3)
Total	31 (100)	76 (100)	13 (100)	120 (100)

$$\chi^2 = 20.206^{**}$$

d.f. = 2

** = Significant at 1 percent

NOTE:- The figure in the parentheses indicate the percentages.

Table-21. Information sources consulted by dairy farmers.

Sl. No.	Information sources consulted	No. of farmers consulting	Percent
1.	Veterinary Doctor	108	90.00
2.	Agricultural Assistant	42	35.00
3.	Livestock Inspector	18	15.00
4.	Fodder Extension Officer	16	13.33
5.	Village Extension Officer	15	10.83
6.	Veterinary Hospital	9	7.50
7.	Karnataka Dairy Development Corporation	9	7.50
8.	Radio	8	6.70
9.	Film show	7	5.83
10.	Neighbours and friends	6	5.00
11.	Progressive farmers	6	5.00
12.	Village leaders	1	0.83

Table-27. Information sources accounted by different adopter categories for medical and non-medical purposes.

Information sources	Low adopters						Medium adopters						High adopters					
	Medical		Non-medical		Medical		Non-medical		Medical		Non-medical		Medical		Non-medical			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
1. Veterinary Doctor	16	51.1	4	12.90	61	80.26	10	13.15	12	52.0	5	58.4						
2. Agricultural Assistant	1	3.2	12	38.7	-	-	24	31.50	-	-	5	58.4						
3. Livestock Inspector	1	3.2	1	3.2	10	13.15	5	6.5	-	-	1	7.2						
4. Fodder Extension Officer	1	3.2	1	3.2	-	-	12	15.70	-	-	2	15.0						
5. Village Extension Officer	-	-	2	6.45	-	-	10	13.15	-	-	1	7.2						
6. Veterinary Hospital	3	10.0	-	-	5	6.5	-	-	1	7.2	-	-						
7. Karamata Dairy Development Cooperative	-	-	1	3.2	-	-	8	10.5	-	-	-	-						
8. Radio	-	-	1	3.2	-	-	6	7.8	-	-	1	7.2						
9. Film show	-	-	1	3.2	-	-	3	3.9	-	-	3	23.0						
10. Neighbours and Friends	-	-	2	6.4	-	-	4	5.2	-	-	-	-						
11. Progressive Farmers	1	3.2	-	-	-	-	4	5.2	-	-	1	7.2						
12. Village Leaders	-	-	-	-	-	-	1	1.3	-	-	-	-						

It could be observed from the table that veterinary doctor was the most consulted source by all the three categories of adopters, mostly for getting information on medical aspects. The percentages of high, medium and low adopters consulting veterinary doctor for medical purpose were 92.0, 80.26 and 51.1 respectively. The second most consulted source i.e., agricultural assistant was sought by all the three categories of adopters for non-medical purpose. More number of low and medium adopters consult livestock inspector for medical purpose, while none of the high adopters seek his advice on medical aspects. The sources less frequently consulted by all the three categories of adopters for non-medical purpose happened to be village extension officer, Karnataka dairy development corporation, radio, film show, neighbours and friends and village leaders.

Economics of dairying: Dairying, as an important subsidiary enterprise, plays a vital role in the rural economy, generating employment opportunities and increasing the income of rural people. It was felt essential to know to what extent it increases the income of the farmer. Hence, this variable was included in the study.

Table-25 depicts the information regarding the cost of milk production, gross returns and net returns the farmers obtain under their situations. It could be observed that the cost of production varies among the different adopter categories. It was found that the respondents belonging to high adoption category were getting as high as Rs. 5.75 net profit per cow per day by incurring an expenditure of Rs. 24.69 per cow per day. The situation was opposite

Table-25. Economics of Dairy enterprise

Adopter categories	Cost of milk production per cow per day (Rs.)	Cost of production per litre of milk (Rs.)	Gross returns per cow per day (Rs.)	Nett returns per cow per day (Rs.)
Low	15.31	2.60	17.26	1.95
Medium	19.90	2.56	22.25	2.35
High	24.69	2.40	28.48	3.79
Average	19.25	2.57	21.63	2.39

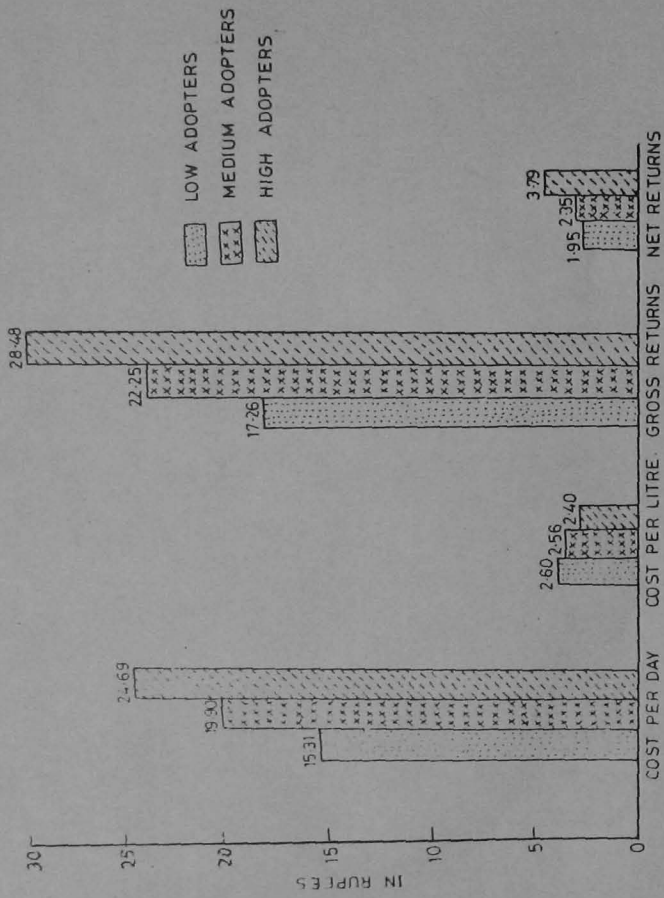


Fig.3 Economics of dairy enterprise.

in case of low adopters, who obtained an average of Rs. 1.95 net profit with an expenditure of Rs. 15.51

Problems involved in adopting improved dairy practices: The problems as expressed by the dairy farmers in different rank orders are shown in Table-24. The data in this table revealed that the major problems expressed by the respondents in the order of their importance were (i) inadequate loan facilities (ii) lack of veterinary dispensary nearby (iii) lack of skilled veterinary personnel (iv) non existence of credit institutions in the locality (v) non availability of medicines in the locality and ^(vi) inadequate information sources.

Table-24. Problems expressed by dairy farmers in different rank orders.

Problem	Total score	Rank order
Inadequate loan facilities	269	I
Lack of veterinary dispensary nearby	178	II
Lack of skilled veterinary personnel	171	III
Non-existence of credit institutions in the locality	159	IV
Non-availability of veterinary medicines in the locality	116	V
Inadequate information sources	97	VI
Lack of good marketing facilities	71	VII
Non-availability of feeds in time	55	VIII

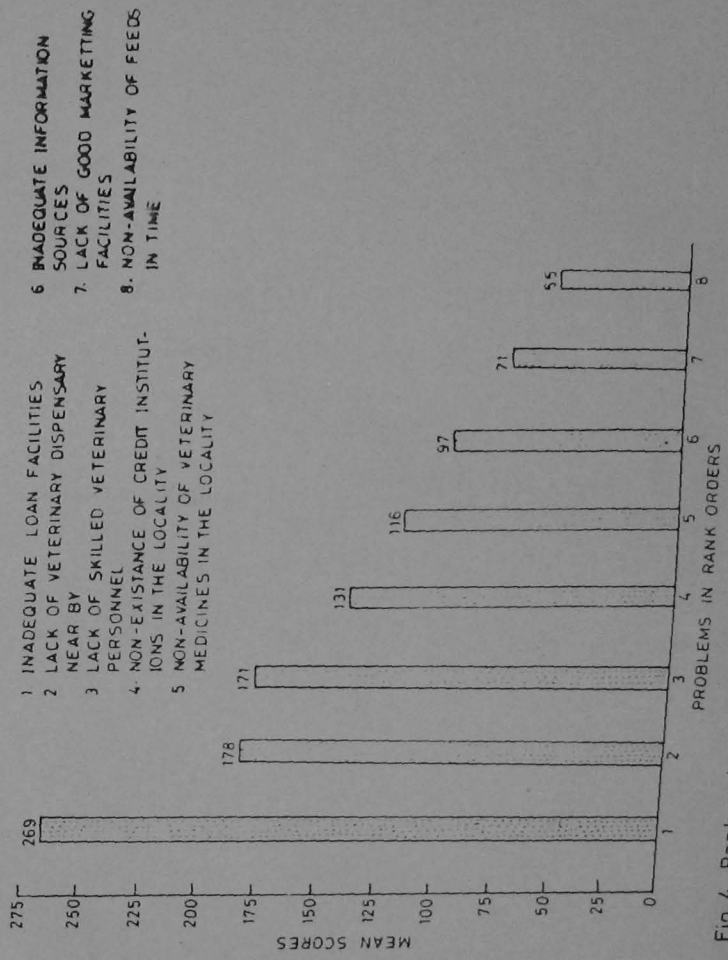


Fig. 4 Rank order of problems expressed by dairy farmers

DISCUSSION

V. DISCUSSION

The findings of the present investigation are discussed under the following heads.

1. Extent of adoption of improved dairy practices.
2. Association between various characteristics of farmers and their extent of adoption.
3. Information sources consulted by dairy farmers.
4. Economics of dairy enterprises.
5. Problems in adopting improved practices.

Extent of adoption of improved dairy practices.

1. Overall adoption level:

The adoption of improved dairy management practices by different categories of farmers, as detailed in Table-1, bring to light that there was no uniform pattern in the overall adoption of improved dairy practices by the farmers. About 65 percent belonged to medium adoption category. 25.8 percent to low adoption category and only 10.8 percent belonged to high adoption category.

The results of the present investigation are in line with the findings of Govindappa (1974), Miranjan Kumar (1979), who reported medium to low level of adoption of improved dairy practices among farmers and were contrary to the finding of Singh *et al.* (1977) who reported that adoption of dairy innovation was medium to high.

The probable reason for each medium to low level of adoption of improved dairy practices may be due to the situation like poor lean facilities, lack of veterinary dispensary nearby and lack of skilled veterinary persons as expressed by the respondents of this study and reported in the results section.

2. Adoption of individual dairy management practices.

Cross bred cows: The data on adoption of cross bred cows, as shown in Table-2, revealed that majority of the dairy farmers (89.17 %) had adopted improved breeds, while only 10.83 percent continued to keep local breeds.

These results are in contradictory to the finding of Rao (1968) who reported that only 11.5 percent were rearing improved breeds.

The possible reasons for the present findings might be that the respondents had adequate knowledge about the advantages of maintaining cross-bred cows and are practicing the same with a view to obtain higher profits from the better breeds.

Dry fodder: It was evident from Table-3 that 65 percent of farmers were feeding their animal with recommended level of dry fodder and 12.5 percent used less than the recommended level of dry fodder, while only 2.5 percent farmers did not use dry fodder.

The results of the study are in line with findings of Chanco Jorda et al. (1976) and Patil (1976).

The plausible reason is that dry fodder being the staple feed for the dairy animals, majority of the farmers were feeding

dry fodder to their animals. Further, the cost of dry fodder is comparatively less than the cost of green fodder or the feed concentrates. The economic factor also seems to have played a major role in the present situation.

Green fodder: The results on the adoption of green fodder by dairy farmers (Table-3) indicated that 58.33 percent of farmers were using recommended amount of green fodder, while 19.17 percent used less than recommended amount. On the whole about 77 percent of farmers were using green fodder and remaining 23 percent did not use the green fodder to the dairy animals.

The results of the study are in conformity with the findings of Channe Gowda (1976) and Patil *et al.* (1976) and were in disagreement with the finding of Tayappa (1976).

The probable reason for such result may be due to the fact that farmers cultivating green fodder were able to feed their animals with no extra cost, while the landless and small holding groups were not able to feed green fodder, by purchasing it at open market incurring extra expenditure.

Feed concentrates: The findings on the adoption of feed concentrates brings to light that on the whole 99.2 percent of farmers were using feed concentrates, with 62.5 percent using the recommended quantity and 36.7 percent using less than the recommended quantity.

The results of the study are in the line with findings of Sinha *et al.* (1974), Channe Gowda (1976), Patil (1976) and Tayappa (1976).

The possible reason for such result may be that farmers are aware of the importance of giving feed concentrates to the animals for obtaining higher milk yield and hence adopted the practice partially or fully.

Artificial Insemination The extent of adoption of artificial insemination, as shown in Table-4, revealed that majority of dairy farmers (89.17%) were practicing artificial insemination to the animals.

The findings are in line with the findings of Sathyanarayana (1967), Rao (1968), Reddy (1971), Sinha (1971) and Channe Gowda (1974).

The probable reasons may be that farmers have realised that artificial insemination is superior to Bull Crossing and helps in improving the breed quantities. Further, artificial insemination is done free of cost by artificial insemination units. This might have motivated large number of farmers to adopt the above said practice.

Vaccination The extent of adoption of vaccination among the respondents, as shown in Table-6, was 77.5 percent.

This finding is in line with the findings of Rao (1958) and Awanti (1981).

The present finding may be explained on the basis of the fact that the Government has taken steps to prevent spread of disease among livestock by deputing the veterinary doctors to go to the villages and vaccinate the animals. Hence, a large number of farmers might have availed this facilities and therefore, a higher adoption was noticed with respect to vaccination practice.

Sanitation: The results indicated that there was cent percent adoption of sanitation practice by the dairy farmers. This finding indicated that the respondents were very much conscious of the health and safety of their dairy animals. It is true that preventive measures requires less expenditure than the expenditure involved actual control of the diseases. This might have made all the respondents of the present study to adopt the sanitation measures as a precautionary measure that could be taken at their level.

Navel Cord Sealing: Although this practice is considered as an important one by the dairy specialists, surprisingly not even a single farmer was practicing it. Table-5, revealed 100 percent non-adoption of this practice.

This finding was somewhat in agreement with the findings of Avanti (1981) who reported that only 16.7 percent farmers were practicing navel cord sealing.

The nil adoption may be due to the lack of knowledge of dairy farmers regarding this practice and coupled with inadequate attention given by the veterinary technicians to this practice in the field situations.

Dehorning: The majority (60%) of dairy farmers had adopted this practice. However, only 43.3 percent of farmers were practicing at the right time, while the other 16.7 percent farmers were practicing at improper time.

This finding is in contrast with the finding of Awasthi (1981), who found that only 20.96 percent of farmer were adopting the method of dehorning.

The dairy farmers by their experiences would have realised the disadvantages of a cow with horn. This might have resulted them in practicing dehorning method.

Milking: Full hand milking being the recommended type it was practiced by only 25 percent of farmers and the remaining farmers continued with their own type of milking.

The cross-bred cows maintained by the farmers might not have been improved phenotypically and the breed might be characterised with smaller teats. Due to this the farmer may feel the inconvenience of full hand milking and thus appreciable number of farmers are not practicing this method of milking.

Cow Dung Utilization: It was observed that only 4.17 percent of farmers were efficiently using the dung by feeding it to bio-gas plant. The remaining 95.83 percent of farmers were using cow dung directly for manure.

The establishment of bio-gas plant requires a huge investment and thorough knowledge of construction and maintenance of the plant on the part of the farmers.

Big farmers and those belonging to high income group can afford to maintain bio-gas plants, while the remaining farmers may not be able to afford. Hence, very few farmers have been seen to use the cow dung for bio-gas plants and a large number use it for

Insurance: It could be observed from Table-6 that the percentage of dairy farmers who had insured their animals was only 44.17 percent.

The plausible reason that could be attributed to such a type of result is that the farmers who borrow loan for dairy from the credit institutions are made to insure the animals compulsorily. As seen from the results of this study elsewhere, many farmers had borrowed loan for the purpose of dairying and these farmers have gone in for insurance willingly or unwillingly.

Record Maintenance: A perusal of the Table-7, brings into sharp focus that the percentage of farmers who maintained the records was only 5.83 percent, while the remaining 94.17 percent of farmers not bothered to maintain the record regarding their dairy enterprise.

The finding is in line with the finding of Awasthi (1961) who reported that only 27.61 percent of farmers were maintaining records.

Generally, the farmers do not maintain any records for their expenditures made and the income obtained on any farming enterprise. This may be because of their illiteracy, ignorance, lack of time and other factors which immensely hold them from maintaining records.

Association between various characteristics of farmers and their extent of adoption:

Age and adoption:

An examination of Table-7 indicated that young, middle and old age farmers were noticed more or less uniformly among all the three categories of adoption viz., low, medium and high.

The test of significance indicated that there was no association between the age groups of the dairy farmers and their extent of adoption.

This finding was in conformity with the research studies reported by Ryan and Gross (1950), Coleman (1951), Rai (1967), Kittur (1976), Raghavendra (1979) and Awanti (1981). However, this trend was not in conformity with the findings of Wilson and Gallup (1955), Jalilal (1960), Dudhani (1969) and others who found significant association between age and adoption behaviour.

The apparent reason that could be offered for this phenomenon is that dairying being a subsidiary occupation yielding a quick remuneration, it attracts the attention of farmers belonging to all age groups. Besides most of the respondents had the minimum educational qualification to their credit, which might have enabled them to be more rational and analytical in their thinking to take up such a remunerative business.

Hence, the hypothesis set for this study that there will be no significant association between the age of the dairy farmers and their extent of adoption of improved dairy management practices was accepted.

Education and adoption

There was almost equal distribution of respondents on all the three categories of educational level, namely, illiterate studied, upto 7th standard and more than 7th standard (Table-8).

The chi-square test indicated that there was no significant association between education and extent of adoption by dairy farmers.

The finding was in agreement with the studies reported by Solanki (1968), Veerabhadraiah (1969), Singh (1979) and Rattalah (1979). On the contrary, this findings was contradicting the observations made Ryan and Gross (1950), Wilson and Galley (1955) Jalihal (1960), Kienberger (1960), Jha (1972), Panadi (1980) and Awanti (1981).

The possible reason for non-significant association of educational level with the adoption of improved dairy management practices might be due to lack of emphasis on dairy information in formal educational system and therefore the formal education may not influence the adoption to an larger extent. It is the structured adult education that could influence the adoption of innovation to an higher extent.

Hence, the hypothesis set for the present study that there will be no significant association between the educational level of dairy farmers and their adoption of improved dairy management practices was accepted.

Land holding and adoption:

An appraisal of Table-9 brings out the fact that there was uneven distribution of respondents on two categories namely, small and large land holding groups. The majority of respondents with small land holding were in low and medium adoption groups, whereas farmers with large land holding were in medium and high adoption groups. The test of significance has brought to light that there was significant association between the size of land holding

and the adoption of improved dairy management practices by dairy farmers.

The findings of Gross (1949), Vanden Ban (1957), Jalihal (1960), Pandit (1964), Shankaraiah (1965), Patel (1967), Reddy (1968), Singh (1970), Ryra Reddy (1971), Kolte (1973), Desai (1975), Chamanlal Gupta (1976), Kappoo (1976), Bemerji (1976), Hundal (1976), Siddalingappa (1978), Raitamaji (1979) and Soti and Kharde (1980) were in line with the present findings, while the findings of Raghavendra (1979), and Avanti (1981) did not support the above findings.

The plausible reason that could be accounted for the significant association of land holding and adoption is that the farmers having bigger land holdings generally have better financial resources than those with small holdings, which enables them to invest for different specialised improved practices. Large farmers have, therefore, adopted more number of improved dairy practice than small farmers.

Based on the above finding the hypothesis set for the present study that there will be no significant association between size of land holding and their adoption of improved dairy management practices was rejected.

Livestock position and adoption:

The significant association of livestock position of dairy farmer with the adoption of improved dairy management practices could be seen from Table-10. It has also brought to sharp focus that there was uneven distribution of respondents on two categories

nately, small and large livestock position groups, indicating that majority of respondents were distributed in small livestock position group, whereas less respondents were distributed in large livestock position group. Whereas majority of the respondents under small livestock position were medium and low adopters, the large livestock position group exhibited medium and high level of adoption.

The findings were in conformity with the research studies reported by Pradipto Roy *et al.* (1968), Patil (1972), Chouhan *et al.* (1973), Ramaloo (1973), Nirmal Kantisha (1973), Govindappa (1974), Gangappa (1975), Kittur (1976) and Mahadevaswamy (1978).

The fact that could be attributed for the significant association of livestock position with the adoption of dairy management practices might be related to the social status of farmer in the village. That is, higher the livestock position, higher will be the status of the farmer in the village. This increase in the status will provide the individual an ability to withstand risk and a psychological feeling to keep ahead of others. Hence, there was a significant association between livestock position and extent of adoption of dairy management practices.

In the view of above findings, the hypothesis that there will be no significant association between the livestock position and extent of adoption of dairy management practices, was rejected.

Herd size and adoption:

It was brought to light in this study that there was significant association between the herd size and adoption of improved dairy management practices. It is further evident from

Table-11 that the farmers with smaller herd size had median and low adoption, whereas those with larger herd size were in median and high adoption categories.

The findings are in agreement with those of Mandal(1976), Benerji (1976), Kumar (1976), Kappas (1976) and Sohi and Iherde (1980) who found a significant relationship between herd size and adoption of dairy management practices. The present finding was contrary to the findings of Sinha *et al.* (1974) and Singh *et al.* (1978) who reported that there was no relationship between herd size and adoption.

The possible reason that could be attributed to the significant relationship of herd size with adoption behaviour is that the larger herd size reduces the maintenance cost of the cows, facilitating the farmer in terms of feeding, taking up regular disease control measures, growing green fodder, etc., In general, it can be said that as the size of the herd increases, the time, money, labour requirement for feeding etc., gets decreased and in turn leading to increase profit per dairy cow. This might be dominant factor that might have influenced the farmers with larger herd size go for adoption of more number of improved dairy practices.

Hence, the hypothesis set for the study that there will be no significant association between the herd size and extent of adoption of improved dairy management practices was rejected.

Credit utilization and adoption:

The data presented in Table-12 shows the distribution of borrowers and non-borrowers was more or less even among all the three categories of adoption namely, low, median and high. The test of significance revealed that there was no significant association between the credit utilization and the extent of adoption of dairy management practices.

This finding was in contrary with the findings of Nachiappan (1975), Pustaswamy (1977) and Kedy (1980). The studies of Manganathan (1975) and Srinivasamurthy (1973) support the present findings.

The basic reason that could be attributed for the non-significant relationship between the credit utilization and adoption of dairy management practices is that mere providing credit will not help to increase the adoption level. It is necessary to provide technical guidance in addition to credit to increase the extent of adoption of dairy management practices.

Hence, the hypothesis set for the study that there will be no significant association between the credit utilization and extent of adoption of improved dairy management practices was accepted.

Organisational participation and adoption:

A perusal of Table-13 brings into the sharp focus that the respondents belonging to low and high organisational participation were more or less uniformly distributed among low, median and high categories of adoption. The test of significance was found to be non-significant.

The findings are in line with results reported by Veerabhadraiah (1970), Kittur (1976), Reddy (1977) and Awanti (1981) in which no significant association was found between organisational participation and adoption.

A number of studies were opposite to the present findings. These are of Venkataramaiah (1971), Byra Reddy (1971), Gangappa (1975), Desai (1975), Siddalingappa (1978), Panadi (1980) and Sohi and Kherde (1980), in which there was significant relationship between organisational participation and the adoption level.

In view of limited interest and attendance in the meetings of different organisations, perhaps there was minimal interaction and lesser degree of exposure to the ideas and experiences of the farmers. This might be the reason for absence of significant association between the dairy farmers' organisational participation and adoption of improved dairy practices. Probably the interaction in the meetings might be more in the areas of crop production rather than in dairying due to obvious reasons.

In view of the above explicit findings, hypothesis that there will be no association between organisational participation and adoption of improved dairy management practice was accepted.

Cosmopolitness and adoptions

Table-14 indicated that there was significant association between the extent of cosmopolitness and adoption of improved dairy management practices by farmers. The results further indicated that majority of farmers in high cosmopolite oriented group were medium and high adopters, while low cosmopolite oriented group consisted of low and medium adopters.

The findings are in line with the findings of Ryan and Gross (1950), Lionberger (1957), Emery (1958), Rogers (1962), Foster (1966), Gangappa (1975), Hundal (1976), Kumar (1976), Surinder Pal Singh (1977) and Panadi (1980).

The reasons might be found in the active role that cosmopoliteness play in adoption behaviour. The rationale is that greater contact with the larger society might have broadened the mental horizons of farmers, thus inducing an information seeking behaviour and motivating farmers to adopt more number of improved practices.

Hence, the hypothesis that there will be no significant association between cosmopoliteness and adoption of improved dairy management practices was rejected.

Economic motivation and adoption:

It was observed from Table-15 that there was no association between the level of economic motivation of farmers and their extent of adoption of improved dairy management practices.

The findings were in contradiction to the findings of Supe (1969), Dhanekar (1970), Ranganatha (1975), Reddy (1975) and Singh *et al.* (1975).

The plausible reason might be that farmers may be economically motivated, but today dairy being a more risky enterprise as observed by Sohi and Kherde (1980), economic motivation has little role to play in adoption. Further, lack of conviction about the improved practices among farmers might also cause low adoption.

In view of the above findings the hypothesis set for the study that there will be no significant association between economic motivation and the adoption of dairy management practices was rejected.

Mass media participation and adoption:

An perusal of Table-16 depicts the fact that there was significant association between mass media participation and adoption of improved dairy management practices by farmers.

Several research studies reported in the past have shown a positive and significant association of mass media participation with adoption. These studies are Gross (1949), Farah (1955), Rai (1967), Lammiarayan (1970), Byra Reddy (1971), Decal (1975), Siami et al. (1977), Schi and Lerde (1930) and Avanti (1981). However, the findings of the study were contradictory to the findings of the studies by Sinha and Kholte (1974) and Kalappanavar (1979).

Increased mass media participation enhance the ability of farmers to get more information, which might have helped the farmers to understand and analyse the benefits of new technology, leading to higher adoption. Mass media provide reinforcement, as experiences of successful farmers are also narrated on radio and newspaper.

In view of these findings hypothesis that there will be no significant association between the mass media participation of farmers and their adoption of improved dairy management practices was rejected.

Level of aspiration and adoption:

An appraisal of Table-17 brings out the fact that farmers with low and medium adoption fell in the group of low level of aspiration, while those with high level of aspiration were also in low and medium adopter categories. The chi-square test indicates that there was no significant association between level of aspiration and extent of adoption by dairy farmers.

The possible reason for non-significant association of level of aspiration with adoption of improved dairy management practices is that the aspiration has little to do with the adoption of improved practices. It is natural that every one will be having an aspiration, but to achieve the aspiration it is the economic condition of the farmers that plays the major role. Economic condition coupled with aspiration could help in increasing the adoption and the aspiration alone can not increase the adoption. Therefore the hypothesis set for the study that there will be no association between level of aspiration of farmers and adoption was accepted.

Extension contact and adoption:

A cursory examination of Table-18 indicated that there was significant association between the extent of contact with extension agency and adoption of improved dairy management practices. It could be further observed from the table that majority of low extension contact farmers were in low adoption category while medium and high extension contact exhibited medium and high level of adoption.

The findings are in line with those of Wilson and Gallup (1955), Liebenger (1957), Rogers (1961), Bahiwal and Gehai (1965), Thakur (1966), Jha (1973), Veerabhadraiah (1973), Byrareddy (1974), Pochaiiah (1975), Bonerji (1976), Mandal (1976), Siani (1977), Sahi and Kherda (1980) and Torgal (1983).

People normally do not adopt a new practice as soon as they hear about it. A change agent is needed to bring about adoption. It might be possible that change agent might have acted to some extent as formal legitimizer, influencing greater adoption of improved practices. Hence, the degree of Extension contact acts as a strong factor in adoption and decision making.

The hypothesis thus set for this study that there will be no significant association between extent of adoption and extension agency contact by dairy farmers was rejected.

Extension participation and adoption:

As observed in Table-19 majority of the farmers with low extension participation fell under low and medium adoption categories, while majority in high extension participation group fell in the medium and high adoption categories. The results of chi-square test indicated that there was a significant association between extension participation and the adoption of dairy management practices.

The findings were in conformity with those of Wilson and Gallup (1955), Marsh and Coleman (1955), Liebenger (1957), Coughenour (1960), Rogers (1962), Bahiwal (1965), Jha and Singh (1966), Jha and Bhakut (1972), Somashekaraappa (1972),

Veerabhadraiah (1973), Byra Reddy (1974), Gangappa (1975), Handal (1976), Kittur (1976), S. Indira Pal Singh (1978), Siddalingappa (1978), Ravikumar (1979), Pannadi (1980) and Torjal (1983), while it was contrary with Ganesh (1976), Kalappanavar (1976) and Avanti (1981).

The reason for this type of tendency may be due to the repeated interaction of dairy farmers with extension personnel, which might have acted as a strong motivational factor for adopting the recommended practices. The change agent might have acted to some extent as formal legitimizer influencing greater adoption of improved dairy management practices, while conducting the extension activities in field situations.

In view of the above finding, the hypothesis set for the study that there will be no significant association between extension participation and the adoption of dairy management practices was rejected.

Awareness and adoption:

A critical glance of Table-20 indicated that the extent of adoption was low to medium among the farmers who fell under the less awareness group, while the majority in high awareness group exhibited medium and high adoption. The results of chi-square test indicated that there was a significant association between the extent of awareness about dairying and the adoption.

The plausible reason for the higher adoption among the high aware group might be that farmers who are aware about new management practices are likely to test them and get the advantages out of them, thereby they adopt the improved management practices when compared to those not aware of the practices.

Hence, the hypothesis stated that there will be no significant association between awareness about dairying and adoption was rejected.

Information sources consulted by dairy farmers:

The information sources consulted by dairy farmers in a sequential order and the purpose for which they consulted i.e. for medical and non-medical purpose have been presented in Tables-24 and 27. The selected information sources were formal, informal and mass media sources.

Veterinary doctor has been indicated as the most consulted formal source of information and ranked first in the sequential order of consultancy. The availability of veterinary doctor at the village and his regular and periodical contacts with the medical information sources might have been a strong factor influencing the farmers to consult him about any new management practices in dairying.

Agricultural Assistant was next in order of consultation by the dairy farmers. He was consulted mostly for the non-medical information, and to some extent for the medical information by low adopters. Agricultural Assistant being a village level worker, it is natural that the farmers have sought his frequently.

Radio was the most consulted mass media source of information, followed by film shows. Among the informal sources, neighbours, progressive farmers were the most consulted sources, while village leader was the least consulted among the informal sources.

The assigning of lower ranks to mass media sources of information might be attributed to the reason that some mass media sources have not asserted themselves to a very large extent in providing more information about dairying for obvious reasons.

It was interesting to note that informal sources were ranked low in the sequential order. Probably the social system did not permit the acceptance of informal sources as most after consulted sources of information because of certain social norms, and also they might have not been adequately trained regarding the dairy management aspects.

The findings of the present study are more or less in agreement with the observations made by Dube (1955), Jha (1965), Sinha *et al.* (1966), Awa tiger (1974), Channa Gowda (1978), Mahadevaswamy (1978), Pandei (1980) and Kallayi Reddy (1985).

Economics of Dairying:

An examination of Table-23 brings to light the cost and returns involved in dairy farming. It could be observed from the table that the average total cost incurred per animal per day by low adopter category was Rs. 15.51, which was less when compared to the cost incurred by the other two adopter categories. The average production cost per litre of milk was Rs. 2.60 and the net return

obtained by low adopter category was Rs. 1.95 per cow per day. The medium and high adopter categories were investing more in milk production and were also getting higher net returns.

The table has clearly indicated that the farmers belonging to high adoption category invested more and got a maximum net return with a low cost of production per litre of milk. Thus, dairying is said to be more economical and remunerative when operated at large scale by adopting all the improved dairy management practices.

Problems in adopting dairy management practices:

A perusal of Table-24 brought to light the problems faced by dairy farmers in adopting improved practices. It would be observed from the table that inadequate loan facilities was the major problem expressed by the respondents, followed by lack of veterinary dispensary nearby, lack of skilled veterinary personnel, and other problems in the order of priority.

The findings of the present study are in conformity with findings of Govindappa (1974), Aswath Kumar (1977), Pattaswamy (1977) and Srinivasa Murthy (1977).

The problems expressed by the respondents indicated the lacuna or inadequacies in effective implementation of dairy development programs in the locality.

SUMMARY

VI. SUMMARY

Dairy enterprise, which plays a vital role in the rural economy, is gaining more importance now-a-days with the introduction of Cross-bred cows and other improved management practices. Recognising the importance of dairying, many dairy development programmes have been planned and implemented in the state of Karnataka. In spite of this, comprehensive studies have not been conducted on the awareness and adoption of improved dairy management practices.

The present investigation was, therefore, conducted on the adoption of improved dairy management practices, information sources consulted, economics of dairying and the problems faced by dairy farmers in adoption of improved practices.

The specific objectives of the study were as follows.

1. To study the extent of adoption of improved dairy management practices among dairy farmers.
2. To explore the association between personal and socio-psychological characteristics of farmers with their extent of adoption of improved dairy management practices.
3. To find out the different sources consulted by dairy farmers for information on improved dairy management practices.

4. To investigate the economics of dairy enterprise.
5. To find out the problems involved in adopting improved dairy management practices.

The study was conducted in Devanahalli taluk of Bangalore district, Karnataka state during 1985. Random sampling was followed in selection of villages and respondents. All the dairy farmers in the eight selected villages, who were members of the milk producers co-operative society, constituted the population for the study. Fifteen respondents randomly selected from each of these selected villages constituted the respondents for this study. Thus, the total sample size was 120 dairy farmers.

The data was collected by personal interview method, with the help of pre-tested structured schedule. Information regarding the adoption of 13 improved dairy management practices viz., Cross-bred cows, use of dry fodder, green fodder, feed concentrates artificial insemination, navel cord sealing, vaccination, dehorning, proper method of milking, sanitation, insurance and record keeping by the dairy farmers was collected and quantified to know the overall adoption level.

The independent variables selected to study their association with the adoption behaviour of the respondents were age, education, size of land holding, livestock position, herd size, credit utilisation, organizational participation, level of aspiration, cosmopolitaness, economic motivation, mass-media participation, extension contact, extension participation and awareness about dairying.

The data were analysed using chi-square test, ranking method and simple percentage. Fourteen hypothesis were formulated for the study and they were tested for acceptance or rejection on the basis of the statistical tests. The important findings of the study were as follows.

1. A majority of the dairy farmer had medium to low level of adoption. In general, it could be said the level of adoption of improved dairy management practices for the sample studied was not satisfactory and there existed a wide technological gap to be filled in.
2. Among the thirteen improved dairy management practices studied, only one practice, i.e., sanitation measures were followed by all the respondents, while more than ^{three}fourths of the dairy farmers had adopted the practices like, rearing cross-bred cows, feeding recommended quantity of dry fodder, feed concentrates, artificial insemination and vaccination. But, it was discouraging to note that very few respondents had followed the key practices, such as feeding recommended quantity of green fodder, navel cord sealing, dehorning and full hand milking.
3. The extent of adoption of dairy management practices by farmers was significantly associated with their land holdings, livestock position, herd size, mass-media participation, extension contact, cosmopolitanness, extension participation and awareness about dairying. However, the variables like age, education, credit use, organizational participation, level of aspiration, and economic motivation did not reveal any significant association with the extent of adoption of

dairy farmers.

4. Veterinary doctor was the most frequently consulted source of information for medical purpose, while Agricultural Assistant was the most consulted source for non-medical information. The other sources consulted by dairy farmers in the order of importance happened to be livestock inspector, fodder extension officer, village extension officer, veterinary hospital, dairy department, radio, film show progressive farmers, neighbours and friends and village leaders.
5. The cost of milk production and the net returns obtained by the farmers belonging to high adoption category was more, while the low and medium adopters invest less and get a small return, with a high production cost per litre of milk.
6. The major problems involved in adoption of improved dairy management practices, as stated by the respondents in order of the importance, were (a) inadequate loan facilities, (b) lack of veterinary dispensaries nearby (c) lack of skilled veterinary personnel and (d) non-existence of credit institutions in the locality.

Implications and recommendations:

The findings of the study have brought out the following implications and recommendations.

1. Since the overall adoption level of dairy farmers was found to be not satisfactory, there is a need to fill up the existing

technological gap by educating the farmers about the improved dairy management practices.

2. The variation in the adoption of improved practices by dairy farmers calls for intensification of educational efforts on key practices such as use of green fodder, full hand milking, navel cord sealing, dehorning of calves etc.
3. The extension agency and the field extension workers should play a determining role in educating the farmers and bringing the pace of adoption to a greater extent, since the extension agency contact and extension participation were found to be directly related with the client adoption behaviour.
4. The rank order of information sources consulted by the dairy farmers presented a very interesting feature. It was found that veterinary doctor was the most consulted source of information by the farmers followed by Agricultural Assistant in the second position. Hence, there is need to provide special training and other facilities for them, so as to keep them abreast with the latest technology of dairying.
5. Looking into the problems expressed by the dairy farmers, it could be said that the dairy development agencies need to extend more services to the farmers. Efforts should be made to create and nourish local institutions for supply of quality cattle feeds, timely credit facilities and assured market for the product besides providing the technical support of veterinary doctors. These services inturn are likely to augment the adoption of improved dairy management practices.

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VII. REFERENCES

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* - Originals not seen

APPENDICES

APPENDIX

SCHEDULE USED FOR DATA COLLECTION

PART : I. Characteristics of Dairy Farmers:

- 1) Name _____ Village _____
- 2) Age _____
- 3) Education _____
- 4) Land holdings
 - Dry _____ acres
 - Wet _____ acres
 - Garden _____ acres
 - _____
 - Total _____ acres

5) Livestock positions

- a) Number of milch animals
 - i) Local _____
 - ii) Cross-bred
 - Holstein-Friesian _____
 - Jersey _____
 - Red-fans _____
- b) Number of draught animals _____
- c) Number of Sheep/Goats _____
- 6) Use of Credit facilities:

Borrowed credit	_____	Not-borrowed credit
	_____	_____

7) Organisational participations

- a) Are you a member/office bearer in any local organisation? Yes/No
- b) If yes, indicate your extent of participation in them?

Organisations	Membership	Regularity in attending meetings		
		Regular	Occasional	Never
Village Panchayat	---	---	---	---
Dairy Co-operative	---	---	---	---
Farmers forum	---	---	---	---
Land Development bank	---	---	---	---

8) Level of aspirations:

- a) What is the type of occupation you desire your son to pursue? _____
- b) To what extent you want to increase the size of your dairy in the next five years? _____
- c) By how many times you want to increase your farm income in the next five years? _____

9) Cooperativeness:

- a) Have you visited any of following animal husbandry/dairy development centres? Yes/No
- b) If yes, how many times you have visited?

Name of the Centres	Visited/ Not visited	Number of times visited
Indo-Danish Project		
Bangalore Dairy		
M.S.A.F.,		
K.L.D.C.,		
Animal Husbandary Department		
Veterinary College		
U.S.D., Dairy		
Other Private Dairies		

10) Economic Motivations: Indicate your opinion about the following statements.

- a) For getting higher milk production in cows/buffaloes, the farmer must use balanced feeds.

Agree/Undecided/Dis-Agree

- b) One cannot adopt improved dairy management practices until the Government provides more incentives to dairy farmers.

Agree/Undecided/Dis-agree

- c) For obtaining higher milk production in cows/buffaloes, the farmer must adopt all the improved dairy management practices.

Agree/Undecided/Dis-agree

- d) A farmer can maintain a good dairy even without the knowledge of improved dairy practices.

Agree/Undecided/Dis-agree

- e) The highest milk producing farmer is a good farmer

Agree/Undecided/Dis-agree

11) Mass-media participation:

a) How often you attend to the following mass-media?

Media	Frequency of use		
	Never	Occasionally	Regularly
i) News paper reading	---	---	---
ii) Farm Magazines reading	---	---	---
iii) Listening to farm radio programmes	---	---	---
iv) Reading leaf-lets on agriculture or dairying	---	---	---
v) Seeing documentary movies	---	---	---

12) Extension contact:

a) Do you know the names of the following extension workers? How often you contact them for getting information on dairying?

Extension worker	Name of the Extension worker	Frequency of contact		
		Never	Once in a crop season	Fewer times in a crop season
i) Agricultural assistant (V.L.W.)	---	---	---	---
ii) Village extension officer	---	---	---	---
iii) Veterinar, Doctor	---	---	---	---
iv) Livestock Inspector	---	---	---	---

13) Extension participation:

a) In which of the following extension activities you participate?

- i) Extension meeting _____
- ii) Exhibitions _____
- iii) Field day _____
- iv) Cattle fairs _____
- v) Film shows _____

14) Awareness about Dairying:

a) Name some of the cross-bred cows you know.

i) _____ (ii) _____ (iii) _____

b) Name some of the trade names of feed concentrates.

i) _____ (ii) _____ (iii) _____

c) Name some of the dairy development centres.

i) _____ (ii) _____ (iii) _____

d) Name some of the common diseases in dairy animals.

i) _____ (ii) _____ (iii) _____

PART : II. Adoption of improved dairy management practices :

Cross-bred cows

1) List the breeds and number of dairy animals you are owning?

Name of the breed	Number of cows
Holstein-Friesian	
Jersey	
Friesian	

Use of roughages

2) How much dry fodder you feed per animal per day?

- 1) Less than 5 kgs. _____
- ii) More than 5 kgs. _____

3) How much green fodder you feed per animal per day?

- 1) Less than 10 kgs. _____
- ii) More than 10 kgs. _____

Feed concentrate and mixtures

4) How much concentrate feed you feed per day per cow?

- 1) Less than 4½ kgs. _____
- ii) More than 4½ kgs. _____

Artificial insemination

5) Do you get your animals artificially inseminated? Yes/No

Navel cord sealing

5) Do you practise the sealing of navel cord in calf? Yes/No

Vaccination

7) Have you vaccinated your cow during this year? Yes/No

If yes, against which disease? _____

Dehorning

6) Do you practise dehorning of the newly born calves? Yes/No

If yes, when it is practised

i) Before 3rd week _____

ii) After 3rd week _____

Cow-dung utilization

9) What do you do with the cow-dung obtained?

i) Use as fuel

ii) Use as manure

iii) Use for filling bio-gas Tank

iv) Others (specify)

Milking

10) How do you milk your animals?

i) By hand _____

ii) By milking equipments _____

b) If by hand, do you practise full hand milking? Yes/No

Sanitation

11) Do you practice the following sanitation measures?

- i) Removal of dung from the shed every day _____
- ii) Good drainage facilities for removal of urine. _____
- iii) Wash the animal daily _____
- iv) Wash the shed with dis-infectants _____

Insurance

12) Have you insured the animal? Yes/No

If yes, indicate the number of animals insured

- i) Cows _____
- ii) Buffaloes _____

Record keeping

13) Do you maintain record for each animal separately? Yes/No

If yes, which items you enter in the record?

- i) _____ (ii) _____
- iii) _____ (iv) _____

PART : III. Economics of Dairying and other Species.

- 1) How many cross-bred milking cows you are owning? _____ Number.
- 2) Indicate the number of days you produced dairy milk during the last one year? _____ Days.
- 3) Give the expenditure incurred on the following items and the returns obtained from your dairy during the last one year.

Expenditure

Item/Operations	Number	Quantity	Value(in Rs.)
-----------------	--------	----------	---------------

a) Feeds:

- i) Roughages
- ii) Concentrates
- iii) Mineral mixture

b) Labour:

- i) Cleaning
- ii) Milking
- iii) Feeding

c) Medical treatment

d) Transport

e) Insurance paid

	Total	Rs.
AMOUNT		

Source	Quantity	Price per Kg./qt.	Returns
--------	----------	-------------------	---------

- a) Milk produced(in Kg.)
- b) Manure

9) Following are some of the common problems faced by dairy farmers, Rank them on the basis of their severity.

- | | Rank |
|---|-------|
| i) Lack of good marketing facilities | _____ |
| ii) Non-availability of feeds in time. | _____ |
| iii) Inadequate loan facilities. | _____ |
| iv) Lack of veterinary dispensary nearby. | _____ |
| v) Non-existence of credit institutions in the locality. | _____ |
| vi) Non-availability of veterinary medicines in the locality. | _____ |
| vii) Lack of skilled veterinary personnel. | _____ |
| viii) Inadequate information sources. | _____ |

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