IMPACT OF CORRESPONDENCE COURSE IN DAIRYING ON ADOPTION OF IMPROVED DAIRY PRACTICES

By

S. RAMKUMAR

THESIS

submitted in partial fulfilment of the
requirement for the degree

Master of Veterinary Science

Faculty of Veterinary and Animal Sciences
Kerala Agricultural University

Department of Extension
COLLEGE OF VETERINARY AND ANIMAL SCIENCES
Mannuthy - Trichur

1987

DECLARATION

I hereby declare that this thesis entitled "IMPACT OF CORRESPONDENCE COURSE IN DAIRYING ON ADOPTION OF IMPROVED DAIRY PRACTICES" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship, or any other similar title of any other University or Society.

Mannuthy,
2-3-88

S. RAJKUMAR

CERTIFICATE

Certified that this thesis entitled "IMPACT OF CORRESPONDENCE COURSE IN DAIRYING ON ADOPTION OF IMPROVED DAIRY PRACTICES" is a record of research work done independently by Sri. S. Ramkumar, under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, associateship or fellowship to him.

Dr. P.S. PUSHKARAN,
(Chairman, Advisory Committee)
Professor and Head,
Department of Extension,
College of Veterinary and Animal Sciences

Mannuthy,
2-3-88

Dedicated to my
beloved parents,
brother and sister

ACKNOWLEDGEMENTS

I feel great pleasure to express my gratitude and obligation towards Dr. P.S. Pushkaran, Professor and Head, Department of Extension, College of Veterinary and Animal Sciences, Mannuthy for his inspiring advice, constant encouragement and valuable guidance during entire period of the present work.

I express my sincere thanks to Dr. A. Ramakrishnan, Director, Centre for Advanced Studies in Poultry Sciences, a member of my Advisory Committee for his healthy and valuable suggestions.

I am grateful to Mr. Narayanan Nair, Associate Professor, Department of Dairy Science and to Mr. N. Ravindranathan, Associate Professor, College of Co-operation and Banking, members of my Advisory Committee, for their constructive suggestions and critical assessment of the work at various stages.

My greatest personal indebtedness and gratitude are due to Dr. C. Bhaskaran, Assistant Professor, College of Agriculture, Vellayani for his technical guidance and wholehearted co-operation in the preparation of my thesis.

I am gratoful to Dr. K. Radhakrishnan, Dean i/c, College of Veterinary and Animal Sciences for the facilities provided for the study.

The constant support and encouragement given by Dr. M. Krishnan Nair, Director, Veterinary Research and Education are acknowledged with due respect.

The many hours of helpful discussion with Dr.G. Nirmalan, Professor, Department of Physiology and Biochemistry is greatly appreciated.

The help and assistance rendered by Dr. K.C. George, Professor of Statistics, Smt. K.P. Santha Bhai, Junior Programmer and Mr. Mathew Sebastian, Department of Statistics, in the successful analysis of data and interpretation of results are acknowledged with pleasure.

I appreciate the valuable support and inspiration given by Dr. V. Raju, Assistant Professor, Dr. M.R. Subhadra and Dr. P.J. Rajkamal, Department of Extension.

My sincere thanks to Mrs. Anila Jayasankar for helping me in the analysis and interpretation of data.

My heartfelt thanks to Dr. T.P. Balagopalan, Department of Surgery, Dr. M. Gopalakrishnan Nair, Department of Pathology, Dr. K.P. Sreekumar, Department of Physiology, Dr. Sisilamma George, Department of Physiology and Dr.(Mrs) Usha,P.T.A. for their constant inspiration, co-operation and help.

Thanks are due to Mr. Chandran, Mr. Sunil, Dr.N. Gopalakrishnan, Mr. Muthukumar and Mr. Ajayakumar for extending their help at one stage or other during my work.

My sincere thanks are due to Miss Anitha, A.V., Mr. Baby Joseph, Miss Bindu, K.A., Mr. Priya Vridan, Miss Bindu, D.T. and Miss Mini Jose for their timely help in giving final shape to my work.

The help rendered by Mr. Nethaji Sitharaman, Associate Professor, Department of Agricultural Extension and his colleagues, Tamil Nadu Agricultural University, Coimbatore are specially acknowledged.

Deep affection and love rendered by Dr. V. Kumarasubramanian, Dr. Padmakumar, Research Scholars, Madras Veterinary College and Dr. Venu P. Nair, Veterinary Officer, KCMMF, Trivandrum are always memorable.

I am thankful to Kerala Agricultural University for awarding the fellowship for the post-graduate study.

Finally, I express my gratitude to all my colleagues, friends and relatives for their encouragement and help.

S. RAMKUMAR

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

Introduction

INTRODUCTION

Estimates show that not more than one-fifth of the available agricultural technology has been absorbed in the villages, benefitting only one-tenth of the farmers. During the post-independence period, milk production has shown a steady increase from 17.4 million tonnes in 1968-52 to about 40 million tonnes at present. According to Nutritional Advisory Committee of the Indian Council of Medical Research, an adult should consume about 210 g of milk per day, which would demand a production of about 80 million tonnes of milk (Tyagi and Mishra, 1984). The yield per animal of 500 kg in India is one of the lowest in the world despite the fact that our country accounts for the largest cattle population in the world (Dairying India, 1985). This evidently highlights the necessity of a mechanism based on which milk production should be brought at least to a level of minimum nutritional demand.

Modernization in agriculture and emphasis on weaker sections has projected dairying to the fore front. In addition to the providing of much needed rich food to the population, dairy husbandry provides organic manure and draught power for cultivation and rural transportation. Progress of dairy husbandry is sine qua non for rural reconstruction and development. The pivotal pressing problems faced by the nation viz., food shortage, malnutrition and unemployment

could be met effectively by focussing attention on the growth of dairy sector.

An up-to-date knowledge on the various dairy husbandry practices is a must for the farmers in optimising return from dairy farming. For the production of more milk, appropriate strategies for transfer of the scientifically formulated 'Package of Practices' ought to be determined by the scientists' group. The fact that dairy development in India depends upon millions of farmers, large and small, scattered all over the country, needs to be emphasized while formulating such strategies. Communicating a technology to the heterogenous group of farmers in the whole of the country with the help of one and the same plan is possibly something next to impossibility.

Contado (1984) has rightly chalked out the role of communication in an extension programme for developing country farmers, as one which should be: (i) to increase the rate of learning by the individual farmers, (ii) to accelerate the spread of recommended practices to a large number of farmers and (iii) to prevent wastage from trial and error or unnecessary time lag between the availability of new practices and their application by farmers. The innovations generated through researches, if do not hit the required lot, the very purpose of such an effort of transfer of technology will remain as a gap to be fused, resulting in the stagnation of the traditional practices, pulling down the growth of national economy. Hence it is quite necessary that these findings

reach the concerned farmers without losing the content imbibed and with an interest arousing thrust.

Gupta (1982) stressed the importance of the use of appropriate teaching of scientific principles. According to him, the growing egalitarian spirit favouring democratization in the distribution of education and the recognition of the fact that education is a multidimensional development of which man is both the end and the instrument calls in for a greater demand for education with thrust on appropriate teaching of various scientific principles. This appropriate teaching can provoke the persons with a degree of social and economic mobility to break through the traditional barriers.

It will be relevant to glimpse through the report of the Education Commission 1964-66, which states: 'It is obvious that these Universities should not be the only agency which should organize correspondence courses. Provision of correspondence courses should also be one important function of the extension service of developmental departments of Government such as agriculture, industries, co-operation and health. This should prove to be a valuable method of conveying to the educated and the neo-literates alike such knowledge and improved techniques as the departments concerned wish to put across'. (Report of the Education Commission 1964-66). This highlights the role of distance education, which still remains due to gain its importance in the National Development.

Of the various extension methods, mass contact technique

of teaching has earned wide approval for its easy accessibility over a large number in quite short time. This gave greater gravity to the concept of distance education, wherein the teacher and learner are at a distance but the learning through teaching continues through various media like printed lessons, radio or television. This concept emerges as a boon in the case of non-formal education wherein the learners are scattered over a large area - short of direct contact with information agency. The difficulty of systematic, frequent assembling to hear lessons can be overcome by introducing this mode of education.

Dairying is an important enterprise in so far as its potential and prospects in Kerala are concerned. Beneath this fact, relevancy of distance education needs to accrue more momentum in Kerala, which, with 69.20 per cent literates ranks first among other states of the country in literacy (1981 census). Exploiting this particular situation, the farmers in Kerala could very well be motivated for adoption of better technology through interesting and informative lessons of correspondence courses.

Realising the need of such a programme in the state, the Directorate of Extension of the Kerala Agricultural University (KAU) conducted a correspondence course in Dairying in 1984. Under this programme, 285 dairy farmers, belonging to different parts of Kerala were regularly supplied with information on scientific dairy practices. The course consisted

of 24 lessons, which contained various aspects of dairying including feeding, breeding, management and disease control.

Unless follow up studies on the effectiveness of such a course is done, the purpose of technology transfer will remain unassessed. A feedback from the farmers, who had undergone the course will naturally reflect upon the worth of this course. This research study was undertaken to judge the impact of correspondence course in dairying. The impact was measured in terms of knowledge, attitude, symbolic adoption and practice adoption of the farmers, who were participants of this correspondence course.

The study has the following specific objectives:

1. To find out the level of knowledge of the participants and the non-participants of the correspondence course about improved dairy practices.
2. To measure the attitude of the participants and the non-participants towards improved dairy management practices.
3. To measure the symbolic adoption (cognitive adoption) of the improved dairy management practices by the participants and the non-participants.
4. To assess the adoption behaviour of the participants and the non-participants in relation to the improved dairy management practices.

5. To investigate the association, if any, between the socio-psychological and economic factors of participants and their extent of adoption of improved dairy management practices.

6. To probe into the reasons for non-adoption of the improved dairy management practices.

This impact study of the correspondence course in dairying will act as an assessment scale of such a type of education. The results of the study will help in designing suitable strategies for streamlining the future correspondence courses to be organised by the Kerala Agricultural University.

Review of Literature

REVIEW OF LITERATURE

Close scanning of previous research studies conducted on the subject was done to understand the existing findings of the level of knowledge, attitude, symbolic adoption and practice adoption of farmers. The possible prevailing types of relationship between the various independent variables and the extent of adoption was also explored. This will help in throwing light and upholding the validity of the findings of this study. Only a few studies pertaining directly to the dairy practices have been reported in the past. Hence a brief review of closely related studies are also incorporated and arranged in this section in the following manner:

1. Level of knowledge of improved practices of farmers.
2. Level of attitude towards improved practices of farmers.
3. Level of symbolic adoption and practice adoption of improved practices by farmers.
4. Relationship between selected independent variables and practice adoption of improved practices.

1. Level of knowledge of improved practices of farmers

Singh and Singh (1974) revealed that 88 per cent respondents had poor knowledge about wheat varieties in both the selected two villages, 12 per cent and two per cent respondents had average knowledge in case of control and treated

villages, respectively. Moreover, 10 per cent respondents were found to have good knowledge in treated village. No respondent from the control village was found to possess good knowledge about wheat varieties. The mean knowledge scores of the respondents of treated and controlled villages showed highly significant difference.

Sood and Sandhu (1976) reported that 12 (13.95 per cent) village level workers had low; 38 (44.19 per cent) medium and 36 (41.86 per cent) high level of knowledge about overall agricultural practices. The mean knowledge score was 42.15 and the minimum and maximum score obtained ranged between 16.80 and 64.90.

Surendran and Pushkaran (1977) in their study observed that knowledge of the people about livestock maintenance was, in general, above average. It was reported to be uniform among the educational and occupation classes.

Sohal and Tyagi (1978) reported that the knowledge about cattle breeding in the rural area was 66.2 per cent of the expected potential knowledge and 65.38 per cent in the urban area. In the non-ICDP area, the knowledge was found to be 19.62 which was quite low. The level of knowledge of feeding practices, was 57.13 per cent in the urban areas and 42.9 per cent in the rural areas. In the non-ICDP areas, the level of knowledge was 36.54 which was very low as compared to the ICDP areas.

Pathak et al. (1979) reported that the differences in the knowledge scores were highly significant between National Demonstration farmers and non-National Demonstration farmers in relation to the improved practices of jute and wheat cultivation.

Malik et al. (1980) from his study on the knowledge of dairy farmers, concluded that the maximum and minimum scores obtained by respondents were 24 and 11 respectively out of a total possible score of 28. The score analysis revealed that there were only 20 per cent farmers in the sample who possessed adequate knowledge of dairy farming.

Nasurin and Vohra (1984) studied the total knowledge level constituted by the sum total of all the four aspects of breeding, feeding, management and health care. They found that most of the respondents (37 per cent) had medium level of knowledge followed by 28 per cent who had high level of knowledge.

Hirevenkanagoudar et al. (1984) reported that the knowledge score of participant and non-participant farmers about National Demonstration itself and about the modern methods of cultivation of wheat and paddy were compared and it was found that the participant farmers had significantly higher knowledge than the non-participant farmers.

Godhandapani (1985) reported that 60 per cent of the respondents possessed medium level of knowledge and 30 per cent

had high level of knowledge about the nutrient application or irrigated GN. Only 10 per cent had low level knowledge.

Nataraju and Channegowda (1985) observed that majority of dairymen (67.3 per cent) had high knowledge level while 32.7 per cent of dairymen had low knowledge level.

Nataraju and Channegowda (1986) revealed from their study on the knowledge level of dairy farmers that majority had medium knowledge level and 19.4 per cent of dairymen possessed high knowledge level, while 13.3 per cent of dairymen had low knowledge level.

2. Level of attitude towards improved practices of farmers

Singh and Singh (1974) reported that only eight per cent respondents in the control village and 24 per cent in the treated village had positive attitude towards wheat. The mean attitude scores for the treated and control villages were 3.26 and 2.84 which showed a significant difference.

Reddy and Reddy (1977) observed that 68 per cent of the farmers were having medium level attitude, 21.71 per cent high level attitude and 10.29 per cent low level attitude towards crop loan system.

Thor and Jha (1978) in their study revealed that majority of the farmers (72 per cent) possessed favourable attitude towards Primary Agricultural Credit Society. Only a small per cent of the respondents had highly favourable attitude. Farmers having unfavourable attitude towards

Primary Agricultural Credit Society accounted for 19 per cent of the sample.

Sawant and Dhole (1978) concluded that 33 per cent of farmers had favourable attitude towards cross-bred animals.

Pathak et al. (1979) reported high significant difference between the attitude scores of National Demonstration farmers and non-National Demonstration farmers towards multiple cropping.

Singh et al. (1979) concluded from their study that 97 per cent of the adopters and 5 per cent of the non-adopters had favourable attitude towards Artificial Insemination. 55 per cent of adopters had strongly favourable attitude towards Artificial Insemination. 82 per cent of the non-adopters and only two per cent of the adopters had unfavourable attitude towards Artificial Insemination.

Thangavelu (1979) observed a significant difference between the beneficiaries of loan and non-beneficiaries of loan in their attitude towards farm-credit from Nationalised Bank. He stated that 15 per cent of the loanees had favourable attitude, 76.25 per cent of the loanees had neutral attitude and 8.75 per cent of the loanees had unfavourable attitude towards farm credit from Nationalised Bank.

Balasubramanian (1980), in his study reported that more than three-fourths (79.17 per cent) of dairy farmers had favourable attitude towards dairying and only 20.83 per cent had shown unfavourable attitude.

Katharkhan (1980) reported that 96.19 per cent of the farmers possessed highly favourable attitude towards the recommended dairy practices and 3.81 per cent were having favourable attitude whereas none were there in the least favourable group.

Ravichandran (1980) observed that majority of the respondents (43.33 per cent) had favourable attitude followed by most favourable attitude (40.84 per cent) towards the Sugar Organisation. Only a less percentage (15.83) of growers belonged to less favourable category.

Sinha and Sinha (1980) reported that 16.6 per cent and 2.05 per cent of non-adopters had only unfavourable and strongly unfavourable attitude towards high yielding variety of maize respectively. Quite a high (71.2 and 66.6) percentage of both adopters and non-adopters had neutral or undecided attitude towards the innovation. Against 14.1 per cent of non-adopters, 28.8 per cent of adopters had favourable attitude towards high yielding varieties of maize. There was no significant difference between mean score of adopters and non-adopters.

Sayeedi and Sohal (1984) observed that majority of dairy farmers (44 per cent) had high favourable attitude, followed by 32 per cent with favourable and 24 per cent having unfavourable attitude towards scientific dairy practices.

Dahiya and Usha (1985) revealed significant difference

in the attitude scores of 30 owners of mini dairies and 30 farmers selected on a matching basis.

3. Level of symbolic adoption and practice - adoption of improved practices by farmers.

Majority of the studies reviewed, pertaining to practice adoption, were mentioned under the heading of adoption. There were only limited number of studies related to symbolic adoption.

Joon et al. (1970) reported that only three per cent of the farmers were adopting all the six practices for high yielding varieties of wheat and bajra. The rest of them were adopting two to five practices.

Jothiraj (1974) revealed that 11 per cent of the respondents were adopting all the four selected practices, 18 per cent three practices, 61 per cent two practices, eight per cent at least one practice, while two per cent of the respondents were not adopting even a single recommended practice pertaining to dairy husbandry.

Singh and Singh (1974) concluded in their study that the percentage of adopters was more in the National Demonstration Village than in the control village. The mean adoption scores for the control and the treated villages were 48.9 and 60.0 respectively.

Vellapandian (1974) observed that out of 120 respondents, majority were adopting all the three practices he studied.

Sinha (1976) observed that among 143 potential adopters of the innovation, only 65 (45.4 per cent) were found to have adopted it. Except one farmer with an Adoption-Quotient of 80, others had Adoption Quotient below 50.

Subramanian (1976) reported that 42 per cent of the respondents had adopted all the seven practices, 22 per cent six practices, 16 per cent five practices, 16 per cent four practices, four per cent three practices and none of the respondents adopted less than three practices in poultry husbandry.

Saini et al. (1977) reported that out of the 143 potential adopters 65 (45.45 per cent) had high adoption whereas about 46 (32.17 per cent) and 32 (22.3 per cent) belonged to the categories of medium and low adoption. The mean adoption score was 52.32.

Vijayaraghavan (1977) observed wide variation in the extent of adoption of all practices for high yielding varieties of paddy, except seed rate among small farmers and in all practices among marginal farmers.

Pillai (1978) concluded that only one practice out of 19 practices was fully adopted by all the swine farmers.

Rahiman and Menon (1978) observed that only 24.5 per cent of the respondents of the correspondence course on paddy cultivation followed all the recommended practices of paddy cultivation.

Sawant and Dhole (1978) reported that just a little more than one-third of members of dairy co-operatives were adopters of cross-breeding practice in cattle, the extent being 37 per cent.

Pathak et al. (1979) observed that the differences in mean adoption intensity scores were highly significant between National Demonstration farmers and non-National Demonstration farmers in relation to the improved practices of jute, paddy and wheat crops.

Subhadra (1979) found that only 5 per cent of the respondents had adoption quotient of hundred, eight per cent had ninety, 11 per cent eighty, 20 per cent seventy, 17 per cent sixty, 18 per cent fifty, eight per cent forty, nine per cent thirty, three per cent twenty and one per cent ten. Cumulative percentage of the respondents indicated that all the respondents had adopted at least one improved practice.

Balasubramanian (1980) concluded from his study that most of the dairy farmers were high in their overall extent of adoption. Majority of the respondents (95 per cent) adopted clean milk production followed by artificial insemination, vaccination against contageous diseases, use of green fodder and commercial cattle feed with 92.13, 79.16, 64.16 and 12.50 per cent of respondents respectively. Vaccination against contageous diseases was adopted to the fullest extent by 67.50 per cent of dairy farmers, while green fodder was used to the fullest extent by 62.5 per cent of respondents

and Artificial Insemination by 50.83 per cent. Clean milk production was adopted upto 50 per cent level by 75 per cent respondents. Commercial cattle feed was adopted upto 0-25 per cent level by 95 per cent dairy farmers. Non-adopters were maximum in the case of commercial cattle feed adoption.

Khaterkhan (1980) reported that 80.95 per cent of farmers had adopted prophylatic innoculation, 80 per cent had adopted rearing of cross-bred dairy animals, while artificial insemination and feeding methods were adopted by 67.62 per cent and 23.81 per cent respectively. Among the non-adopters for various practices feeding methods ranked first with 76.19 per cent followed by artificial insemination with 32.38 per cent.

Sahi and Kherde (1980) revealed from their study on dairy adoption behaviour that out of 120 respondents 21.67 per cent were low adopters, 53.33 per cent were medium adopters and 25 per cent were high adopters.

Somasekharan (1980) in his study obtained the mean value of extent of adoption of selected husbandry practices as 74.64. Maximum frequency of adopters were in the high category of adopters (49 per cent). The percentage of milk producers who had low and medium extent of adoption were 16 and 33 respectively.

Vijayaraghavan and Subramanian (1980) observed that in the case of garden land farmers, the use adoption-quotient

ranged from 15 to 91.62 with the average of 56.50, when such range for dry land farmers was from 0 to 85.37 with the average of 29.50. The symbolic-adoption quotient of garden land farmers ranged from 17.50 to 9.62 with the average of 67.40 and for dry land farmers 0 to 90.42 with the average of 52.20.

Raju (1981) observed that the mean adoption among the beneficiaries and non-beneficiaries were 53.75 and 53.55 respectively.

Kolgi and Usha (1985) reported that the majority of the respondents formed average to higher side of adoption groups while only 18 per cent of the respondents were low in adoption of dairying innovations.

Singh et al. (1985) analysed the scores of adoption of dairy innovations of the respondents of dairy progressive and dairy non-progressive villages separately in their study. A perusal of the mean adoption scores of the two groups indicated that the adoption of dairy innovations of the respondents of the dairy progressive village was significantly better than that of the respondents of the dairy non-progressive villages.

Kakoty and Sharma (1986) observed that 94 per cent and 83 per cent of the total respondents adopted improved disease control and breeding practices respectively, while only 27 per cent and 15 per cent respondents adopted improved feeding and management practices respectively.

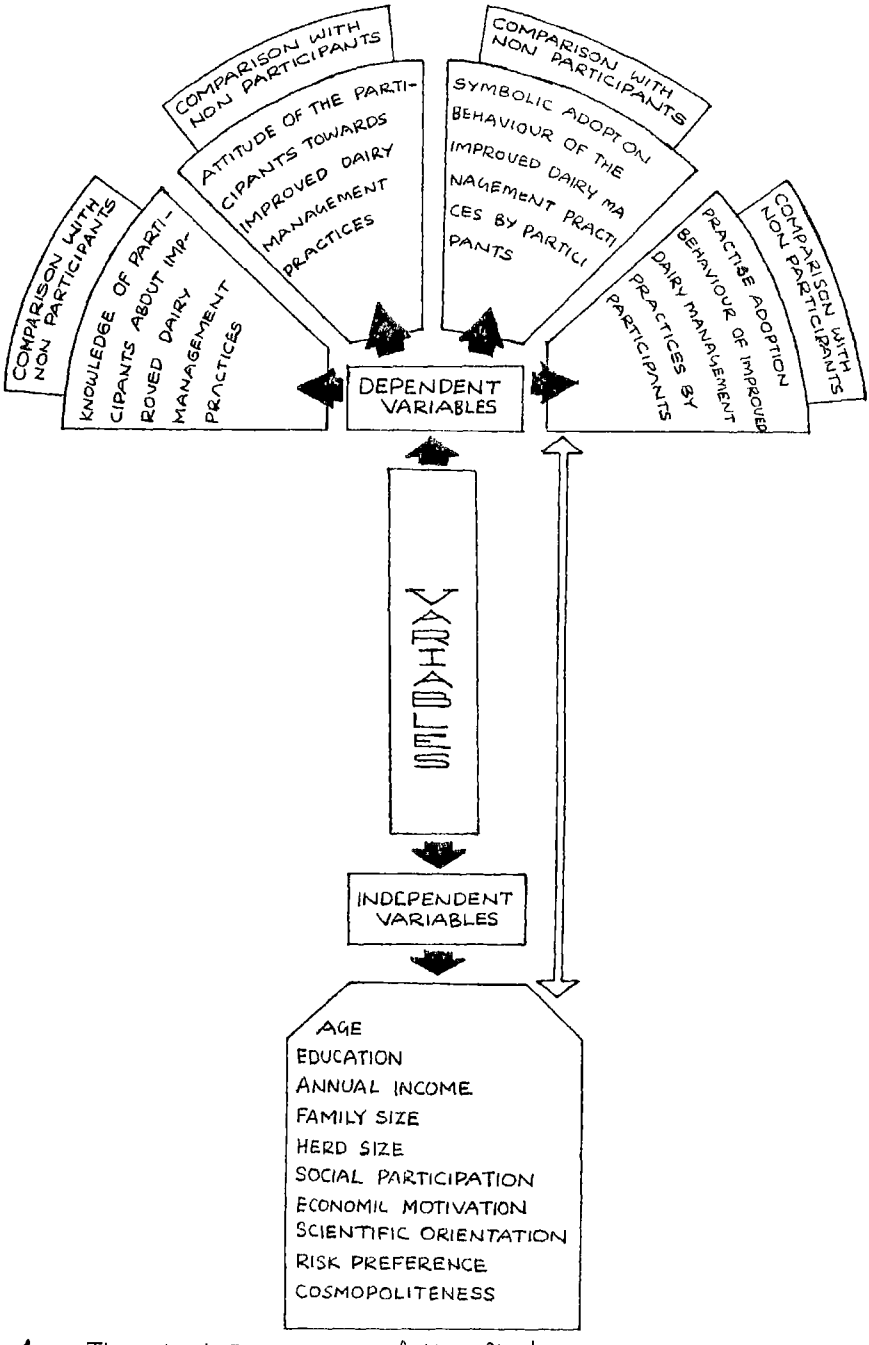


Fig. 1. Theoretical Framework of the Study

Bhaskaran (1978) observed no correlation between the farmers age and their extent of adoption of improved agricultural practices.

Subhadra (1979) found that age was not related to the adoption of selected improved practices.

Balasubramanian (1980) noted negative and highly significant association of age with adoption behaviour.

Somasekharan (1980) found that age had no significant influence on the extent of adoption.

Titus (1981) observed a positive but non-significant correlation of age with adoption of improved farm practices.

Kologin and Usha (1985) stated that age was negatively and significantly correlated to adoption.

Kokoty and Sharma (1986) noted that age did not have significant association with the adoption of dairy production innovations.

Nataraju and Channegowda (1986a) observed that age was not associated with adoption level of dairymen.

Education

Joon et al. (1970) noted that there was no association between education and extent of adoption of practices.

Singh and Singh (1970) reported significant association between educational status and level of adoption.

Jaiswal et al. (1971) noted significant and positive influence of education on the innovative behaviour of farmers.

Jha and Shaktawat (1972) found significant and positive association between education and level of adoption.

Subramanyam and Lakshmana (1973) observed that education level of the respondents had a positive and significant relation with the adoption.

Jothiraj (1974) observed that the level of education and adoption of artificial breeding practices had no relationship with each other but had a positive relationship with other three practices viz., use of commercial cattle feeds, preventive vaccination and regular breeding.

Sharma and Nair (1974) reported that there was no significant relationship between education level and adoption of improved practices.

Vellapandian (1974) obtained positive association between education and extent of adoption.

Menon and Rao (1975) reported absence of significant association between the level of education and the adoption of demonstrated practices.

Sinha et al. (1976) observed that farmers education was not an accelerating or limiting factor for promotion of dairying in general and cattle feed mixture in particular.

Subramanian (1976) observed positive correlation between education and adoption of dairy husbandry practices.

Saini et al. (1977) noted that the level of adoption of dairy husbandry practices was not influenced by the educational status of the dairyman.

Bhaskaran (1978) reported that education had no correlation with extent of adoption.

Singh and Dubey (1978) found out that the level of education of respondents had no influence on adoption of feeding fodder in combination but it had association with the adoption of mineral mixture.

Subhadra (1979) observed that education had no significant association with the adoption of Animal Husbandry Practices.

Balasubramanian (1980) found out positive significant relationship between level of education and adoption of dairy innovations.

Somasekharan (1980) obtained positive significant relationship between level of education and level of adoption.

Katherkhan (1980) noted significant relationship between education and adoption of cross-bred dairy animals.

Godhandapani (1985) observed positive and significant association with extent of adoption.

Kologi and Usha (1985) observed positive and significant relationship between level of education and adoption of dairying innovations.

Kakoty and Sharma (1986) noted that adoption of dairy production innovations was significantly associated with education.

Nataraju and Channegowda (1986a) stated that education had no influence on adoption behaviour of different strata of cattle owners.

Annual Income

Hussain (1971) observed that the number of farmers adopting all the package of practices were more among those with low income.

Perumal and Duraiswamy (1972) reported that cultivation of hybrid maize, was strongly and positively related to farmers income.

Chandrakandan (1973) found that farmers with higher income were better adopters of cultivation practices for rice in Tanjore district.

Anbalagan (1974) found positive relationship between income and adoption of practices.

Jothiraj (1974) observed that gross annual income of the respondents was influencing the use of commercial cattle feeds and regular breeding but had no relationship with the adoption of artificial breeding practice, and preventive vaccination.

Chandrakandan and Subramaniam (1975) observed that income had significant positive association with adoption.

Menon and Rao (1975) noted the absence of any association between the economic status and the adoption of demonstrated practices.

Oliver et al. (1975) reported that income had significant bearing on the adoption of practices of paddy through Newspaper 'Dinamani'.

Subramanian (1976) observed that poultry farmers gross income was negatively correlated with the extent of adoption of improved poultry practices.

Kaleel (1978) observed that income was positively correlated to adoption of practices.

Subhadra (1979) reported that the gross income of dairy farmers did not influence the adoption of selected husbandry practices in general. Among the practices studied, the adoption of artificial breeding, deworming of calf and timely veterinary aid were the only practices found to have significance with gross income.

Balasubramanian (1980) reported highly positive and significant relation between the annual income and adoption behaviour.

Ravichandran (1980) noted positive and significant association of income with adoption.

Somasekharan (1980) observed that annual income was not related to the extent of adoption of husbandry practices.

Kologi and Usha (1985) observed positive and significant relationship between the annual income and adoption of dairying innovations.

Family size

Sinha et al. (1976) observed that family size did not show any significant relationship with the adoption of cattle-feed mixture.

Saini et al. (1977) revealed from their study that family size recorded negative significant relationship with adoption which meant that farmers with larger family size tended to adopt less dairy innovations.

Kakoty and Sharma (1986) noted that family size was not significantly related to adoption of dairy production innovations.

Herd size

Jothiraj (1974) observed high significant and positive correlation between herd size and extent of adoption of selected dairy husbandry practices.

Subramanian (1976) concluded that flock size had positive and significant correlation with the extent of adoption of poultry husbandry practices.

Saini et al. (1977) found that extent of adoption was not associated with herd size.

Singh and Dubey (1978) reported that herd size had no influence on the adoption of selected dairy husbandry practices.

Subhadra (1979) observed no relationship between herd size and the adoption of dairy husbandry practices.

Balasubramaniam (1980) reported that herd size had no influence on the adoption of dairy innovations.

Somasekharan (1980) noted that herd size was having positive correlation with extent of adoptions of selected husbandry practices.

Kologi and Usha (1985) observed positive and significant relationship between herd size and adoption of dairying innovations.

Kakoty and Sharma (1986) observed that herd size was not significantly associated with the adoption behaviour.

Nataraju and Channegowda (1986) observed that adoption level of small farmers, marginal farmers and agricultural labourers did not vary with the herd size possessed by them.

Social participation

Das and Sarkar (1970) noted a direct relationship between social participation and adoption of recommended practices by farmers.

Joon et al. (1970) found that social participation had positive and significant association with the adoption of high yielding varieties.

Saha (1973) observed that social status and participation in rural institutions contributed to the adoption of practices among small-farmers.

Anbalagan (1974) found positive relationship between social participation of the respondent and their adoption of improved practices.

Karim and Mahboob (1974) reported the strong relationship between social participation and adoption of improved practices.

Vellapandian (1974) observed that social participation had association with the extent of adoption.

Menon and Rao (1975) reported that there was no association between social participation of the Agriculturists and the adoption of practices.

Sinha (1976) observed significant association between social participation and adoption of cattle feed mixture.

Saini et al. (1977) pointed out that respondents with high levels of social participation did not show high adoption levels of improved Animal Husbandry Practices.

Bhaskaran (1978) found out that there was no relationship between social participation and extent of adoption.

Prasad (1978) reported significant and positive relationship between social participation and adoption behaviour of farmers.

Rajendran (1978) indicated that the social participation of the farmers had positive and significant correlation with the adoption by small farmers.

Subhadra (1979) observed that social participation had no influence on the adoption of selected dairy husbandry practices.

Somasekharan (1980) observed that social participation had direct correlation with extent of adoption.

Kologi and Usha (1985) noted positive and significant relation for social participation with adoption of dairying innovations.

Economic Motivation

Supe (1969) observed that economic motivation was positively related to the rationality in decision making among the farmers.

Das and Sarkar (1970) reported that there was direct relationship between economic motivation and the adoption of practices.

Singh and Singh (1970) found out that economic motivation had significantly contributed in the explanation of the adoption behaviour of farmers.

Subramanian (1976) concluded that the economic motivation was not correlated with the adoption of improved practices by poultry farmers.

Vijayaraghavan (1977) indicated positive and significant relationship between economic motivation and the adoption of improved cultivation practices by small farmers.

Somasekharan (1980) observed that economic motivation was not having significant association with the extent of adoption.

Tyagi and Sohal (1984) concluded that the economic motivation had positively significant relationship towards the adoption of dairy innovation.

Kologi and Usha (1985) indicated positive and significant relationship between economic motivation and adoption of dairying innovation.

Scientific orientation

Supe (1969) found out that scientific orientation was positively related to the rationality in decision making among the farmers.

Sinha et al. (1976) revealed that the farmers with better scientific orientation did not distinguish themselves by achieving higher adoption levels.

Subramanian (1976) reported that the adopters of poultry husbandry had more scientific orientation.

Saini et al. (1977) observed that scientific orientation was related to adoption of improved dairy husbandry practices.

Vijayaraghavan (1977) indicated positive and significant correlation between scientific orientation and adoption.

Somasekharan (1980) observed that scientific orientation was positively correlated with the extent of adoption.

Risk Preference

Supe (1969) observed that risk preference of the farmers was positively related to the rationality in decision making among the farmers.

Jaiswal et al. (1971) noted that the risk taking willingness had significant and positive influence on innovative behaviour of farmers.

Subramanian (1976) found that the adopters of improved poultry husbandry practices had greater tendency to face risk.

Bhaskaran (1978) observed the absence of any relationship between the risk perception and extent of adoption of improved agricultural practices.

Rajendran (1978) observed that risk orientation had positive and significant relationship with the adoption behaviour of small farmers.

Somasekharan (1980) reported that risk preference had no significant association with the extent of adoption.

Titus (1981) concluded that perceived risk and uncertainty has a negative correlation to adoption of the new farm practices.

Kologi and Usha (1985) revealed the existence of a positive and significant relationship between risk orientation and adoption of dairying innovations.

Cosmopoliteness

Jaiswal et al. (1971) noted that cosmopoliteness had significant and positive influence on innovative behaviour of farmers.

Pushkaran (1975) revealed significant relationship between adoption and cosmopolite outlook among poultry farmers.

Sinha et al. (1976) concluded that cosmopoliteness had significant association with adoption level of cattle feed mixture.

Saini et al. (1977) observed that cosmopoliteness was related to adoption of improved dairy husbandry practices.

Somasekharan (1980) observed that cosmopoliteness was not having any relationship with extent of adoption.

Materials and Methods

MATERIALS AND METHODS

The purpose of this research was to study the impact of correspondence course in dairying on adoption of improved dairy practices and to probe into the presence of any significant relationship between selected independent variables and practice adoption behaviour of the participants. The materials and methods utilized in the investigation are furnished below under the following sub-headings.

1. Operational definitions used in the study
2. Selection of sample
3. Selection of variables and their measurement
4. Methods of investigation
5. Analytical procedures

1. Operational definitions used in the study

Participants:

Those individuals who had undergone the correspondence course in dairying conducted by the KAU in 1983-84.

Non-participants:

Those individuals who had not undergone the correspondence course in dairying conducted by the KAU in 1983-84, and who were selected on a matched pair basis with the participants.

Symbolic adoption:

This refers to the mental decision (cognitive decision) of the respondent to make full use of an innovation.

Adoption/practise adoption:

This refers to the decision of the respondent to put in use or actually practise the innovation.

Knowledge:

Refers to what the respondent knows about the various topics dealt with in the correspondence course in dairying.

Attitude:

Refers to what the respondent feels about the improved dairy practices.

Artificial insemination:

Inseminating the cow artificially which is the accepted policy of the Kerala State Animal Husbandry Department for cattle improvement.

Feeding commercial cattle feed:

Feeding of cattle with cattle feed available in ready to feed form from the market.

Colostrum feeding:

Feeding of colostrum to the calves in their initial days, after birth.

Early breeding:

Inseminating the cow in the second heat, but within three months after calving.

Preventive vaccination:

Protective inoculations against diseases like Foot and Mouth, Haemorrhagic Septicaemia, Rinderpest and Anthrax.

Antiseptic washing:

Washing udder with mild antiseptic solution after milking.

Full hand milking:

The scientific way of milking using the full hand.

Deworming of calves:

Periodical administration of medicines to save the calves from internal parasitic infestation.

Selection of sample:

Participant farmers:

From the 285 farmers who had registered for the correspondence course in dairying in the Directorate of Extension of the Kerala Agricultural University (KAU), 50 participants were selected using simple random sampling technique. The respondents thus selected belonged to various districts of Kerala.

Non-participant farmers:

A matching sample of 50 non-participants were selected from the same villages where participants were selected, adhering to the following set of criteria.

1) Non-participant farmer should not have participated in the correspondence course in dairying conducted by the KAU.

2) Non-participant farmer should have an economic status on par with the participant farmer.

3) The matching group of non-participant farmers should possess an equal number of milch animals possessed by the participant farmer.

4) The matching group of non-participants should have the same educational status as that of the participant farmer.

5) The size of the land holding by the matching group of non-participants should be the same as that of the participant farmer.

Selection of variables and their measurement.

Measurement of dependent variables.

Knowledge:

Cronback (1949) defined knowledge test as one in which procedures, apparatus and scoring have been fixed so that precisely the same test can be given at different times and places.

A standardised knowledge test defined by Noll (1957) is one that has been carefully constructed by experts in the light of acceptable objectives or purposes and procedures for administering, scoring and interpreting. Scores are specified in detail so that the results should be comparable and norms and averages for different age and status have been predetermined. Nair (1969) measured knowledge level of farmers on recommended package of practices of rice using teacher made test with multiple choice using questions as suggested by Anasthasi (1961). This method was followed by Kamarudeen(1981).

Singh and Singh (1974) followed the technique of measuring knowledge using knowledge score. The total knowledge score of each respondent was calculated as follows:

$$\text{Knowledge score} = \frac{\leqq x_i}{n} \times 100$$

where x_i = number of questions answered correctly

n = total number of questions asked.

Singh and Prasad (1974) measured knowledge by working out knowledge quotient, calculated as follows:

$$\text{Knowledge quotient} = \frac{\text{obtained knowledge score}}{\text{Actual total score}} \times 100$$

The mean knowledge scores of the participants and non-participants of the correspondence course were compared using t-test to confirm significance of difference.

In this study knowledge is operationalised as the knowledge of the participants and non-participants of the correspondence course in dairying on the content of the lessons.

It was measured using teacher made test with items selected from the twenty-four lessons of the correspondence course in dairying.

The following procedure was adopted for selecting the knowledge test items and framing the 'knowledge test set'.

Many experts of the KAU who wrote the script of the lessons and contributed to the correspondence course in dairying were consulted and the complete content of the course was

studied to make a question bank. Finally, a set of thirty questions to test the knowledge was prepared. Twenty experts from the College of Veterinary and Animal Sciences, were selected as judges for relevancy and difficulty judgements. They were asked to differentiate these thirty questions in two categories each based on the above two criteria namely, 'relevant or not relevant' and 'difficult or easy'. The judged materials were tabulated and compounded and finally a set of eight statements were selected based on the discrimination index of each statement. Discrimination index was measured using the following formula.

$$\text{Discrimination index} = \frac{\text{Number of correct responses in the high group} - \text{Number in low group}}{\text{Number of responses in criterion group}}$$

Each question carried two marks. Perfect answering would fetch two marks and partially correct answers deserved one mark. Wrong answers were given zero mark. Thus the total knowledge score of the respondent varied within the range of '0-16'.

Based on the mean knowledge score of the participants and the standard deviation the respondents were classified into three groups as follows:

SD = Standard deviation

Sl.No.	Category	Knowledge score
1	Low $<$(mean-1 SD)	below 75
2	Medium (mean $\pm$ 1 SD)	76-92
3	High $>$ (mean + 1 SD)	93 and above

Attitude

Kaura and Singh (1960) developed a scale to measure farmers' attitude towards artificial insemination using the method originally used by Likert (1932).

Gupta and Sohal (1974) developed a scale to measure dairy farmers attitude towards dairy farming using the scale Discrimination Technique of Edwards and Kilpatrick (1948).

Jalihal (1976) formulated a scale with 22 items using the summated ratings suggested by Likert (1932).

Salunkhe (1978) constructed a scale to measure small farmers' attitude towards Small Farmers Development Agency (SFDA), which contained eight statements.

Chandrakandan (1982) defined attitude towards farm broadcast as the degree of positive or negative disposition associated with farm broadcast. He developed a scale which consisted of six items using the method of equal appearing intervals by Thurstone and Chave (1929).

In the present study, in order to measure farmers' attitude towards improved dairy management practices, an attitude scale was developed following the 'scale product method' which combines the Thurstone's technique of equal appearing interval and Likert's technique of summated rating as proposed by Eysenck and Crown (1949). This scale had ten items which helped in determining one's strength of attitude towards various dairy management practices.

The same method as described by Edwards (1957), with slight modification in the procedures, was used for developing the attitude scale. The methodology followed is discussed below.

Collection of attitude statements

Eighty attitude statements about dairy management practices were initially collected from the lessons and then edited for selection of items, comprising the attitude scale. Editing of the statements was done on the basis of the criteria suggested by Edwards (1957). Out of the eighty statements collected initially, 33 statements were selected for judges' ratings.

Obtaining judges ratings

All the 33 statements were then judged on a nine point continuum by 50 judges. The judges selected for this comprised of Extension Specialists, teachers and post-graduate students of various departments in the Veterinary College. The judges were asked to indicate their perception of the degree of favourableness or unfavourableness expressed by each of the statements towards improved dairy management practices.

Statements that seem to express the most unfavourable feelings about improved dairy management practices are to be placed in the first continuum. Those statements that seem to express the most favourable feelings about improved dairy

management practices are to be placed in column nine. The neutral column (5) is where statements which express neither favourable nor unfavourable feelings about the psychological object are to be placed. Varying degrees of increasing favourableness are expressed by columns six to nine and varying degrees of increasing unfavourableness by four to one.

The judges were reiterated that the researcher was interested to study not their own attitude towards improved dairy management practices but their perceptions of the degree of favourableness/unfavourableness expressed by each of the statements. These instructions and the original statements are given in Appendix 2. Out of these 50 judges, 44 judges returned the statements after duly reporting their judgements. Four judges were eliminated on the criteria of Thurstone and Chave (1929) for carelessness in judging or otherwise failed to respond to the instruction sent for judgement. Thus, finally the responses of 40 judges were considered for calculation of the scale and Q values of the attitude statements. Tabulation was done indicating the number of judges who placed each item in each continuum. From these data proportion of responses and their cumulative proportions were computed. The median of the distribution of judgements for each statement was taken as its scale value, which was calculated using the following formula.

$$S = l + \frac{0.50 - pb}{pw} i$$

where,

S = the median or scale value of the statement

l = the lower limit of the interval in which the median falls

pb = the sum of the proportions below the interval in which the median falls

pw = the proportion within the interval in which the median falls

i = the width of the interval and is assumed to be equal to 1.0.

The variation of the distribution of judgements for a given statement was measured by the interquartile range (Q) used by Thurstone and Chave (1929). The 'Q' value which contains the middle 50 per cent of the judgements was determined by measuring the 75th centile and 25th centile. The 25th and 75th centiles were obtained using the following formulae:

The 25th centile

$$C_{25} = l + \frac{0.25 - pb}{pw} i$$

where,

C_{25} = the 25th centile

l = the lower limit of the interval in which the 25th centile falls

pb = the sum of the proportions below the interval in which the 25th centile falls

pw = the proportion within the interval in which the 25th centile falls

i = the width of the interval and is assumed to be equal to 1.0.

The 75th centile

$$C_{75} = l + \frac{0.75 - pb}{pw} i$$

where,

l = the lower limit of the interval in which the 75th centile falls

pb = the sum of the proportions below the interval in which the 75th centile falls

pw = the proportion within the interval in which the 75th centile falls

i = the width of the interval and is assumed to be equal to 1.0.

Then the interquartile range or Q was measured as the difference between C_{75} and C_{25}.

$$Q = C_{75} - C_{25}.$$

Final selection of attitude statements

For selection of the attitude statements to constitute a scale, the following criteria were used.

1) The statements should have smaller Q values as far as possible.

2) The statements selected should represent the universe of opinion or contents with respect to the dairy management practices.

3) The scale values should have equal appearing intervals i.e., distributed uniformly along the continuum.

4) There should be equal number of statements indicating favourable and unfavourable attitudes.

Based on these criteria, ten statements were finally selected. Five statements were positive and five were negative. The statements selected along with their scale values (S) and Q values are furnished in Appendix 3.

Final format of the scale and scoring procedure

The attitude statements selected finally were arranged randomly in order. The final format of the scale, consisted of five columns representing a five-point continuum of agreement to disagreement towards the statements as followed by Likert in his summated Rating Technique of attitude measurement. The five points on the continuum were: Strongly agree, agree, undecided, disagree and strongly disagree, with weights of 5, 4, 3, 2 and 1 respectively for the favourable statements and with weights of 1, 2, 3, 4 and 5 respectively for the unfavourable statements.

While administering the scale, the respondents were asked to respond to each statement in terms of their own degree of agreement or disagreement by checking a tick mark (✓)

in the proper column. After getting the responses, the scoring was done by the method proposed by Eysenck and Crown (1949). According to this method, the weights of Likert and scale values of Thurstone were combined in the form of product. The total score for an individual was the sum of the products of all the statements. Eysenck and Crown (1949) reported that this method of scoring led to a higher reliability.

Reliability of the scale

Guilford (1954) defined reliability as the proportion of variance in obtained test scores. The reliability of the attitude scale constructed for the present study were tested by the following two procedures.

i) Test-retest method

In this method, the scale was administered to 25 farmers twice with 15 days interval. Thus two sets of attitude scores were obtained for the same respondents and the two sets of scores were correlated. The correlation coefficient was 0.87 which was significant at 1 per cent level of probability indicated that the scale was highly stable and dependable for measurement.

ii) Split-half method

Here, the scale administered to 30 farmers was divided into two halves based on odd-even number of statements. Two sets of scores were obtained on half-forms of scale for the

Based on the mean attitude score of the participants and the standard deviation, the respondents were classified into three groups as follows:

Sl.No.	Category	Attitude score
1	Less favourable <(mean-1 SD)	187 and below
2	Favourable (mean ± 1 SD)	Between 183 and 223
3	Most favourable >(mean + 1 SD)	224 and above

Symbolic adoption

Vijayaragavan and Subramaniam (1980) used symbolic adoption quotient to express the extent of symbolic adoption.

Ambastha (1986) has stated the concept of Klonglan and Coward about adoption process as one which had two different elements: (1) 'the symbolic adoption element in which the idea was accepted, and (2) the 'use adoption element' in which the material component or the practice was accepted.

Ambastha (1986) in his study defined symbolic adoption as the decisions made by the former to adopt innovations with respect to summer paddy and dwarf wheat.

Extent of symbolic adoption in the present study was measured by symbolic adoption index. There were 8 practices and each practice was assigned a score of 1 for symbolic adoption and zero for non-adoption. Symbolic adoption index was calculated by the following formula.

same farmers and the scores were correlated. The coefficient of correlation between the two sets of scores was found to be highly significant at one per cent level of probability ($r = 0.834$). This was indicative of the high internal consistency that the attitude scale possessed.

Validity of the scale

The validity of the attitude scale was tested in two ways, which is given below:

i) Content validity

This was ensured in the collection and selection of statements for the scale. Care was taken to include all the statements which represent the universe of content of the various dairy management practices.

ii) Concurrent validity

The known group method was used as the criterion for this purpose. The opinion leaders of two milk co-operative societies were asked to name eight persons each with most favourable attitude and eight persons with most unfavourable attitude towards improved dairy management practices. By using this criterion, a sample of 32 respondents were taken. The final scale was administered to these 32 respondents and their total scores calculated. For the demonstration of discrimination power of the scale between the two known contrast groups, students 't' test was applied and the 't' value of 9.2 was significant at one per cent level. This proved that the scale was valid.

$$\text{Symbolic Adoption Index} = \frac{\text{Respondents score}}{\text{Total score}} \times 100$$

On the basis of the mean symbolic adoption index the participants were classified as low, and high symbolic adopters.

Sl.No.	Category	Symbolic adoption score
1	Low (upto mean)	89 and below
2	High (above mean)	90 and below

Practise adoption

Wilkening (1952) used an index for measuring the adoption of improved farm practices. The index used was the percentage adopted to the total number of practices applicable. He suggested differential weights in the adoption index.

Marsh and Coleman (1955) used a practice adoption score computed as the percentage of applicable practices.

Supe (1969) used an unweighted practice adoption score. He selected 10 practices of cotton and for each practice the total score for complete adoption was 6. The practices were divisible and were assigned partial scores for partial adoption.

Rogers and Shoemaker (1971) defined adoption as a decision to make full use of an innovation.

For the purpose of this study, the term 'adoption' has been substituted by the term 'Practice adoption', which refers to actually practising the various dairy management practices.

In the present study, extent of adoption was measured using the adoption index developed by Sengupta (1967) and modified by Jothiraj (1974). There were 8 practices and each practice was assigned score of 2 for full adoption, 1 for partial adoption and '0' for non-adoption. Practise adoption index was calculated by the following formula.

$$\text{Practise Adoption Index} = \frac{\text{Respondent's score}}{\text{Total score}} \times 100$$

On the basis of extent of practise adoption, the respondents were classified as low, medium and high adopters, using mean adoption index and standard deviation as measures of check.

Sl.No.	Category	Adoption score
1	Low $<$ (mean-1 SD)	66 and below
2	Medium (mean $\pm$ 1 SD)	67-85
3	High $>$ (mean + 1 SD)	86 and above

Measurement of independent variables

Age

The chronological age of the respondent was calculated as the number of years completed since his birth to the date of interview.

The respondents were classified into three age groups keeping mean and standard deviation as measures of check.

Sl.No.	Category	Age in years
1	Young <(mean-1 SD)	36 and below
2	Middle (mean ± 1 SD)	37 to 56
3	Old >(mean + 1 SD)	57 and above

Education

The respondents were categorised into three groups based on their educational status. The procedure suggested by Trivedi (1963) and adopted by Somasekharan (1980) was used to measure the educational level of the respondents in the study, with slight modifications. Those respondents who were middle school educated were assigned a score of 1, high school educated a score of 2 and college educated a score of 3 respectively.

The respondents were categorised into three groups as follows:

Sl.No.	Category	Education scores
1	Middle school	1
2	High School	2
3	College education	3

Annual income:

Based on the gross annual income of the family through

all sources including dairying the respondents were classified as follows:

Sl.No.	Category	Income per annum
1	Low (upto mean)	Below Rs.9,700/-
2	High (above mean)	Rs.9,701 to Rs.21,500/-

Family size

Based on the total number of members in the family the participants were categorised into three groups as given below:

Sl.No.	Category	Number of members in the family
1	Low	4 and below
2	Medium	5 to 7
3	High	8 and above

Herd size

The method adopted by Subhadra (1979) was used for the study with slight modification. The participants were classified according to the herd size they posseased as follows.

Sl.No.	Category	Number of dairy animals possessed
1	Small	2 and below
2	Medium	3 to 5
3	Large	6 and above

Social participation

It is the level of participation of the participants in various organisations. The attendance in the meetings of the organisation was considered. Score of one was given for membership in an organisation. Score of 2 was assigned for 'regular' attendance in meetings and 1 point for occasional and 0 point for no attendance in any meeting. The participants were thus categorised into 3 groups.

Sl.No.	Category	Social participation scores
1	Low <(mean-1 SD)	1 and below
2	Medium (mean $\pm$ 1 SD)	2 to 3
3	High >(mean + 1 SD)	Above 3

Economic motivation

Moulik (1965) developed a scale for measuring the economic motivation of farmers. Supe (1969) measured the economic motivation of the farmer using a scale which consisted of six items against a five point continuum from 'strongly agree' to 'strongly disagree'. There were five positive and one negative items. This scale was used to measure the economic motivation of the participants, in this study. The scoring adopted was as follows:

Response	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Score for positive items	5	4	3	2	1
Score for negative items	1	2	3	4	5

After finding out the total scores of the participants, mean was taken. The participants were categorised into three groups, using standard deviation as a measure.

Sl.No.	Category	Economic motivation score
1	Low < (mean-1 SD)	6 to 21
2	Medium (mean ± 1 SD)	22 to 24
3	High > (mean + 1 SD)	Above 24

Scientific orientation

Kanarudeen (1981) operationalized scientific orientation as the degree to which a farmer is oriented to the use of scientific methods in decision making in farming.

Sunny Philip (1984) defined scientific orientation as the extent and degree of scienticism in the positive operational behaviour of the farmers.

For the purpose of measurement of this variable, the scale developed by Supe (1969) and adopted by Somasekharan (1980) was used. There were six items rated on a five-point continuum ranging from strongly agree to strongly disagree. There were five positive items and one negative item. The scoring adopted was as follows:

Response	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Score for positive items	5	4	3	2	1
Score for negative item	1	2	3	4	5

The total scores of the respondents and their mean was taken. Using standard deviation as a measure the respondents were categorised into three groups as follows:

Sl.No.	Category	Scientific orientation score
1	Low < (mean-1 SD)	22 and below
2	Medium (mean ± 1 SD)	23 to 27
3	High > (mean + 1 SD)	28 and above

Risk preference

In this study risk preference of the participants was measured using the scale developed by Supe (1969). The scale consisted of six items against a five point continuum from 'strongly agree' to 'strongly disagree'. There were four positive and two negative statement. Scoring adopted was as follows:

Response	Strongly agree	Agree	Undecided	Dis-agree	Strongly disagree
Score for positive items	5	4	3	2	1
Score for negative items	1	2	3	4	5

Using the mean of the total scores of the participants and standard deviation as check, the participants were categorised into three groups as follows:

Sl.No.	Category	Risk preference score
1	Low < (mean-1 SD)	6 to 21
2	Medium (mean ± 1 SD)	22 to 23
3	High > (mean + 1 SD)	Above 23

Cosmopoliteness

The scale developed by Supe (1969) and adopted by Somasekharan (1980) was used. There were four items rated on a five point continuum ranging from 'strongly agree' to 'strongly disagree'. There were two positive and two negative items. The scoring procedure was as follows:

Response	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Score for positive items	5	4	3	2	1
Score for negative items	1	2	3	4	5

Total score and their means were taken. Using mean as the measure of check, the participants were categorised into two groups.

Sl.No.	Category	Cosmopoliteness score
1	Low (upto mean)	17 and below
2	High (above mean)	Above 17

Methods of investigation

The data were collected using a well structured, pre-tested interview schedule by personal interview with the respondents. The schedule used in the study is shown in the appendix.

Analytical procedure

Percentage

Simple comparison and relationship were made on percentage basis.

Chi-square

In order to explore the association between the various personal and socio-psychological characteristics and the extent of adoption of recommended practices, Chi-square analysis was carried out using the two-way contingency tables of size r x c. Participants were first classified into high, medium and low adopters based on their adoption scores, using mean and standard deviation as measure of check. Those categories were then studied in relation to the personal and socio-psychological variables. The aggregate of the adopters in the various personal and socio-psychologic groups were studied in relation to the frequencies through chi-square analysis.

The formula used for computing chi-square values is given below (Snedecor and Cochran, 1967).

$$\chi^2_{(r-1)(c-1)} = \frac{\leqq(O-E)^2}{E}$$

where,

$(r-1)(c-1)$ = Degrees of freedom of a r x c table for the chi-square value calculated

O = observed frequency

E = expected frequency

r = number of rows

c = number of columns

t-test

t-test was employed to compare the mean scores on knowledge, attitude, symbolic adoption and practise adoption of participants and non-participants.

Standard normal deviate test

The proportions obtained for various levels of adoption were compared for significance using the standard normal deviate test, and the value obtained was designated as 'Z'.

Correlation coefficient

Co-efficient of correlation was calculated to find out the extent of correlation between the dependent variable (Y) and independent variables (X) and also among the independent variables. Correlation coefficient (r) was computed using the formula

$$r = \frac{\leq XY - \frac{(\leq X)\ (\leq Y)}{n}}{\sqrt{\left[\leq X^2 - \frac{(\leq X)^2}{n}\right]\left[\leq Y^2 - \frac{(\leq Y)^2}{n}\right]}}$$

The significance of r was also tested.

Multiple regression

Multiple linear regression was worked out to analyse the influence of independent variables namely age, education, annual income, family size, herd size, social participation, economic motivation, scientific orientation, risk preference and cosmopoliteness on the extent of practise adoption of improved dairy management practices. The procedure as given by Snedecor and Cochran (1967) was followed. ANOVA table was fitted to reveal the significance.

The linear model assumed was of the form.

$Y = a + b_1x_1 + b_2x_2 + \ldots\ldots\ldots\ldots\ldots b_nx_n + R$

Y = The dependent variable which is the extent of practise adoption measured as adoption index.

a = intercept constant

b_i's= regression coefficients

x_1 = Chronological age of the participant

x_2 = Educational level of the participants measured as scores.

x_3 = Annual income of the participants based on gross income of his family through all means.

x_4 = family size based on the number of members in the family.

x_5 = herd size based on the number of animals reared

x_6 = social participation of the participants measured by attributing scores

x_7 = economic motivation of the participants measured by attributing scores.

x_8 = scientific orientation of the participants measured by attributing scores.

x_9 = risk preference of the participants measured by attributing scores.

x_{10} = Cosmopoliteness of the participants measured by attributing scores

x_1 to x_{10} are the independent variables.

R = represents the residual effects.

Path analysis:

Haque and Ray (1983) conducted path analysis to get clear picture of the direct and indirect effects of the selected independent variables on the adoption of recommended species of fish in composite fish culture.

Effort was put in the investigation to analyse the relative contribution of each independent variable in explaining the variations in the extent of practice adoption by using path analysis. The direct and indirect effects of various independent variables were studied by path coefficient analysis. A table of direct and substantial indirect effects was constructed to help in further selection of the variables. The procedure suggested by Kempthorne (1957) was used for the purpose.

Results

RESULTS

The results of the study are furnished under the following headings in this chapter.

1. Level of knowledge of the participants about improved dairy practices and its comparison with that of the non-participants.
2. Level of attitude of the participants towards the improved dairy management practices and its comparison with that of the non-participants.
3. Extent of symbolic adoption of the participants of the improved dairy management practices and its comparison with that of the non-participants.
4. Extent of practise adoption of the participants of the improved dairy management practices and its comparison with that of the non-participants.
5. Influence of socio-psychological and economic characters of participants on the adoption of improved dairy management practices.
6. Comparison of symbolic and practise adoption behaviour of participants of improved dairy management practices and reasons for absence of full adoption of improved dairy management practices.

1. Level of knowledge of the participants about improved dairy practices and its comparison with that of the non-participants

The mean knowledge score of the participants was 84 with a standard deviation of 8.67 and that of the non-participants was 40.25 with a standard deviation of 14.57. The 't' test revealed a significant value of 18.06 between the two groups at 0.01 level, indicating that the knowledge level of the participants was considerably higher than the non-participants. These details are given in table 1.

The participants and non-participants were categorised into low, medium and high knowledge levels as shown in table 2. This grouping was done, taking into account the mean knowledge score of the participants and the standard deviation as a check.

The data focusses the following findings:-

Of the total participants 13 (26 per cent) were grouped under the low knowledge level whereas a majority of the non-participants, 49 (98 per cent) fell under this group. These values were tested for proportionate significance which revealed a Z value of 4.57 which was significant at 0.01 level.

Majority of the participants 25 (50 per cent) came under the group of medium knowledge level whereas only a negligible number of the non-participants 1 (2 per cent) came under this group. This was also tested for proportionate significance which showed a value of 4.71 which was significant at 0.01 level.

Table 1. Comparison of the mean score values of knowledge of the participants and non-participants

Variable	Mean scores		t value
	Participants (n=50)	Non-participants (n=50)	
Knowledge	84	40.25	18.06*

* Significant at 1 per cent level

Table 2. Comparison of the knowledge levels of participants and non-participants

n = sample size

Category	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	per cent	
Low (75 and below)	13	26	49	98	4.57
Medium (76-92)	25	50	1	2	4.71*
High (93 and above)	12	24	0	-	3.46

* Significant at 1 per cent level

The high knowledge level group consisted of 12 (24 per cent) participants and interestingly there was no one in this group from the non-participants lot. The Z value of 3.46 showed significance at 0.01 level when tested for proportionate significance.

Figure 2 condenses these findings in a more easy understandable bar graph.

2. Level of attitude of the participants towards the improved dairy management practices and its comparison with that of the non-participants

The mean attitude score of the participants was found to be 205.48 with a standard deviation of 18.34 and that of the non-participants was 173.60 with a standard deviation of 18.10. The t value between these two groups as revealed in table 3, was 8.64 which was significant at 0.01 level. This indicated that there was significant difference in the attitude of participants and non-participants towards the dairy management practices.

The participants and non-participants were categorised into less favourable, favourable and most favourable attitude groups, based on the mean attitude score and standard deviation of the participants, as shown in table 4.

The data leads to the undermentioned findings:

Of the total participants, 3 (6 per cent) were categorized in the less favourable attitude group whereas a majority of the non-participants 34 (68 per cent) came under this group. These values were tested for the proportionate significance which gave a Z value of 5.10 which was significant at 0.01 level.

Majority of the participants 37 (74 per cent) came under the group of favourable attitude whereas only 16 (32 per cent) of the non-participants showed this level of attitude. Proportionate significance test revealed an Z value of 2.88 which was significant at 0.01 level.

The most favourable attitude group consisted of 10 (20 per cent) participants which remained blank when turned for to be filled in from the non-participants group. The Z value of 3.16 also revealed significant difference at 0.01 level when tested for proportionate significance.

The findings are summarised as bar graph in figure 3.

Table 3. Comparison of the mean score values of attitude of the participants and non-participants

Variable	Mean score		t value
	Participants (n=50)	Non-participants (n=50)	
Attitude	205.48	173.60	8.64*

* Significant at 1 per cent level

Table 4. Comparison of the attitude levels of the participants and non-participants

n = sample size

Category	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Less favourable (187 and below)	3	6	34	68	5.10*
Favourable (188-223)	37	74	16	32	2.88*
Most favourable (224 and above)	10	20	0	0	3.16*

* Significant at 1 per cent level

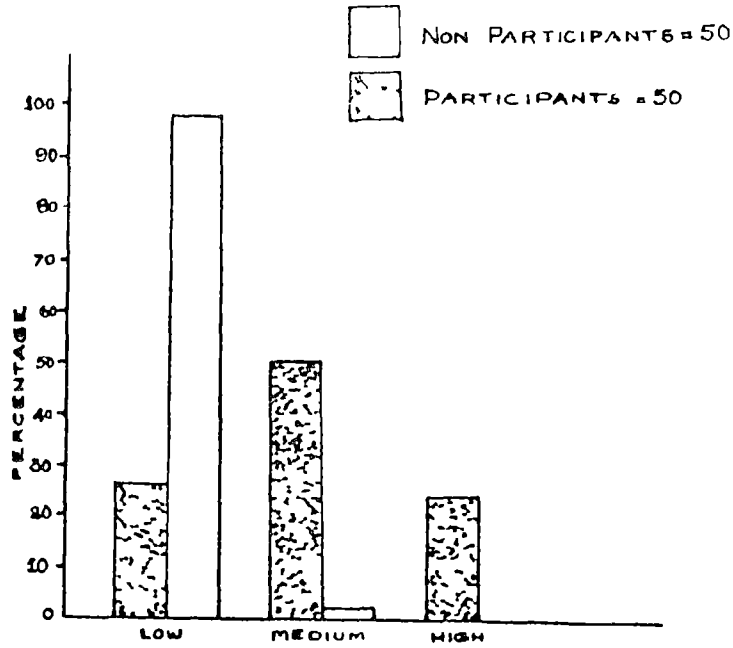


Fig 2 KNOWLEDGE LEVELS OF PARTICIPANTS AND NON-PARTICIPANTS

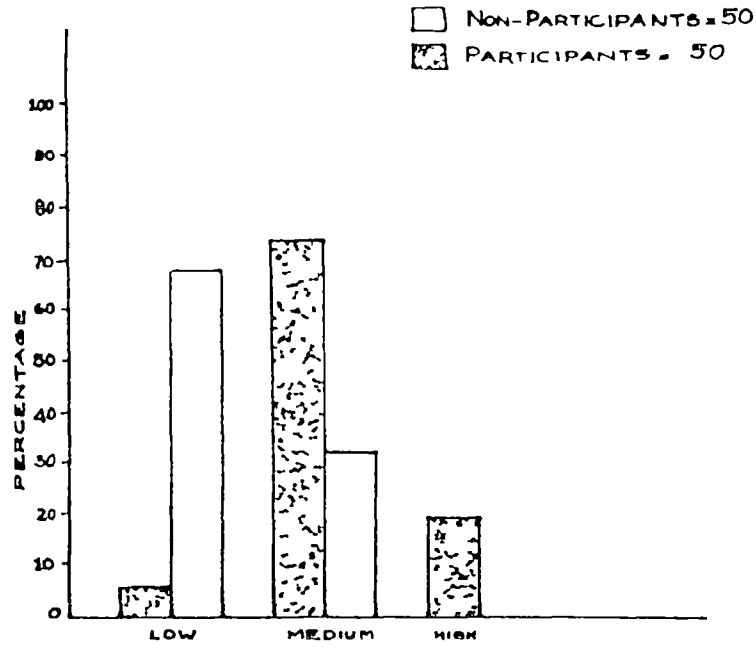


Fig 3 ATTITUDE LEVELS OF PARTICIPANTS AND NON-PARTICIPANTS

3. Extent of symbolic adoption of the participants of the improved dairy management practices and its comparison with that of the non-participants

The mean symbolic adoption index of the participants was 96.08 with a standard deviation of 6.84 and that of the non-participants was 73 with a standard deviation of 11.28. As evidenced from table 5 the 't' value of 12.25 revealed significant difference between the control and experimental groups at 0.01 level. This indicated that the symbolic adoption level of participants was significantly different from that of the non-participants.

The participants and non-participants were classified as low and high symbolic adopters based on the mean symbolic adoption index and the standard deviation of the participants as given in table 6. The medium group consisted of no respondents from either participants or non-participants and hence this class was deleted.

The data highlights the following findings:

Of the total participants a majority 37 (74 per cent) were high symbolic adopters, whereas only 2 (4 per cent) of the non-participants were grouped in this category.

The low symbolic adopters consisted of 13 (26 per cent) from the participant group and 48 (96 per cent) from the non-participant group.

Both of the above mentioned groups gave significant 'Z' values of 4.48 and 5.6 when tested for proportionate significance test at one per cent level.

Figure 4 gives the above details in a bar graph.

Table 5. Comparison of the mean score values of symbolic adoption of the participants and non-participants

Variable	Mean scores		t value
	Participants (n=50)	Non-participants (n=50)	
Symbolic adoption	96.08	73	12.25*

*Significant at 1 per cent level

Table 6. Comparison of the symbolic adoption levels of the participants and non-participants

n = sample size

Category	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Low (89 and below)	13	26	48	96	4.48*
High (90 and above)	37	74	2	4	5.6*

* Significant at 1 per cent level

4(a) Extent of practise adoption of the participants of the improved dairy management practices and its comparison with that of the non-participants

The mean practise adoption index of the participants was 76.12 with a standard deviation of 10.24, and that of non-participants was 41.38 with a standard deviation of 10.45. The 't' test revealed a significant difference between the two groups at 0.01 level (t value being 16.62) indicating that

the practise adoption level of participants was considerably higher than the non-participants. This is given in table 7.

The participants and non-participants were categorised into low, medium and high practise adopters as shown in table 8.

Table 7. Comparison of the mean score values of the practise adoption of the participants and non-participants

Variable	Mean score		t value
	Participants (n=50)	Non-participants (n=50)	
Practise adoption	76.12	41.38	16.62*

* Significant at 1 per cent level

Table 8. Comparison of the practise adoption levels of the participants and non-participants

n = sample size

Categories	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Low (66 and below)	6	12	49	98	5.80*
Medium (67-78)	30	60	1	2	5.21*
High (86 and above)	14	28	0	-	3.74*

* Significant at one per cent level

Of the respondents from the participant group, 6 (12 per cent) who had adoption index below 66 were categorised

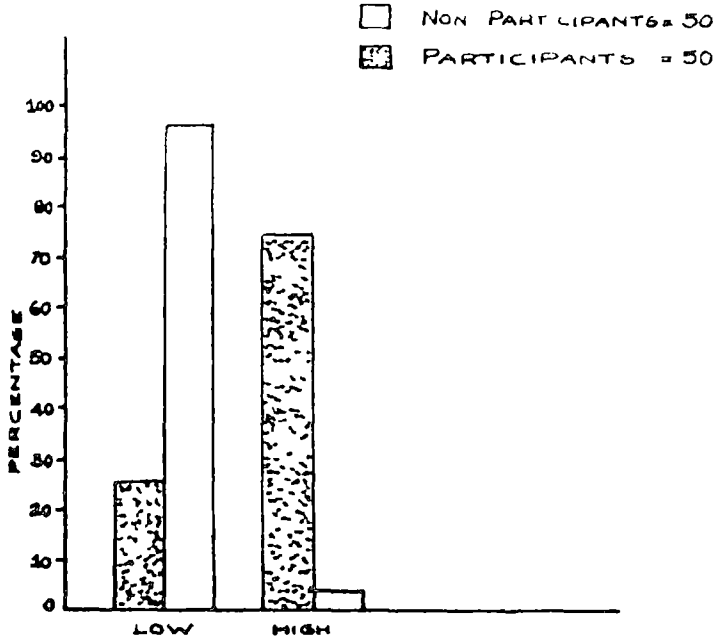


Fig.4. SYMBOLIC ADOPTION LEVELS OF PARTICIPANTS AND NON PARTICIPANTS

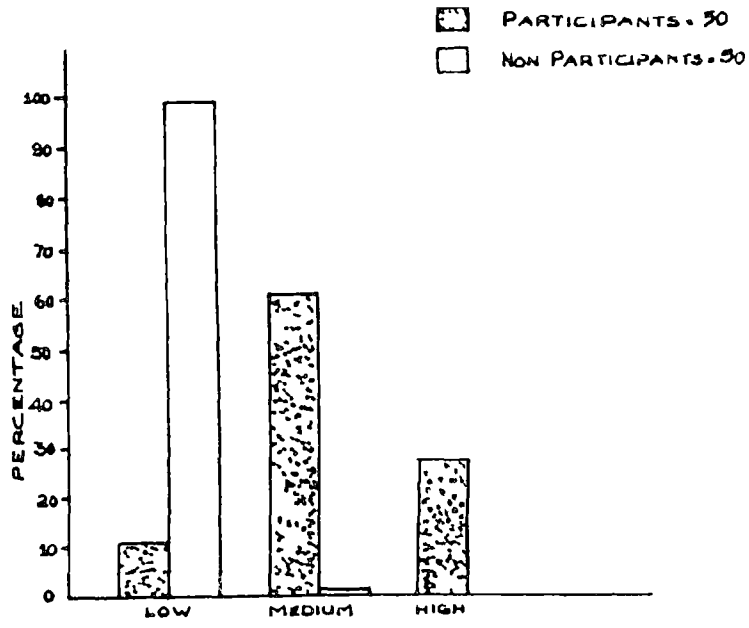


Fig 5 PRACTISE ADOPTION LEVELS OF PARTICIPANTS AND NON-PARTICIPANTS

as low practise adopters. The medium practise adopters constituted 30 (60 per cent) from the participant group who had scores 67-85 and 14 (25 per cent) participants with adoption scores 86 and above were considered as high practise adopters. As per the above classification 49 (98 per cent) from the non-participants were low practise adopters and 1 (2 per cent) was medium practise adopter. Interestingly there was no respondent from the non-participants in the high practise adopters' group.

The frequency of respondents of low group, medium group and high group practise adopters in the participants and non-participant groups were tested for proportionate significance. The significant Z values obtained at one per cent level were 5.80, 5.21 and 3.74 respectively between the participant groups of the low, medium and high practise adopters.

The data brings to focus that a majority of participants were medium practise adopters of the selected dairy husbandry practices whereas majority of the non-participants were low practise adopters of the selected dairy husbandry practices. The findings are summarised as a bar graph in figure 5.

4(b) Comparison of the practise adoption pattern of participants and non-participants

Data presented in the table 9 and figure 6 indicate that a majority (88 per cent) of participants obtained scores between 68 and 93 indicating high and medium adoption level of the respondents.

In the case of non-participants 80 per cent obtained scores between 38 and 48 indicating a very low practise adoption behaviour.

Table 9. Frequency distribution of adoption index scores of participants and non-participants

n = sample size

Adoption index	Mid point	Participants (n=50)		Non-participants (n=50)	
		Frequency	Cumulative frequency	Frequency	Cumulative frequency
1-5	3				
6-10	8				
11-15	13				
16-20	18			1	1
21-25	23			2	3
26-30	28				0
31-35	33			10	13
36-40	38			12	25
41-45	43			11	36
46-50	48			7	43
51-55	53				0
56-60	58	3	3	4	47
61-65	63	4	7	2	49
66-70	68	12	19	1	50
71-75	73	13	32		
76-80	78		0		
81-85	83	4	36		
86-90	88	9	45		
91-95	93	5	50		
96-100	98				
		n=50		n=50	

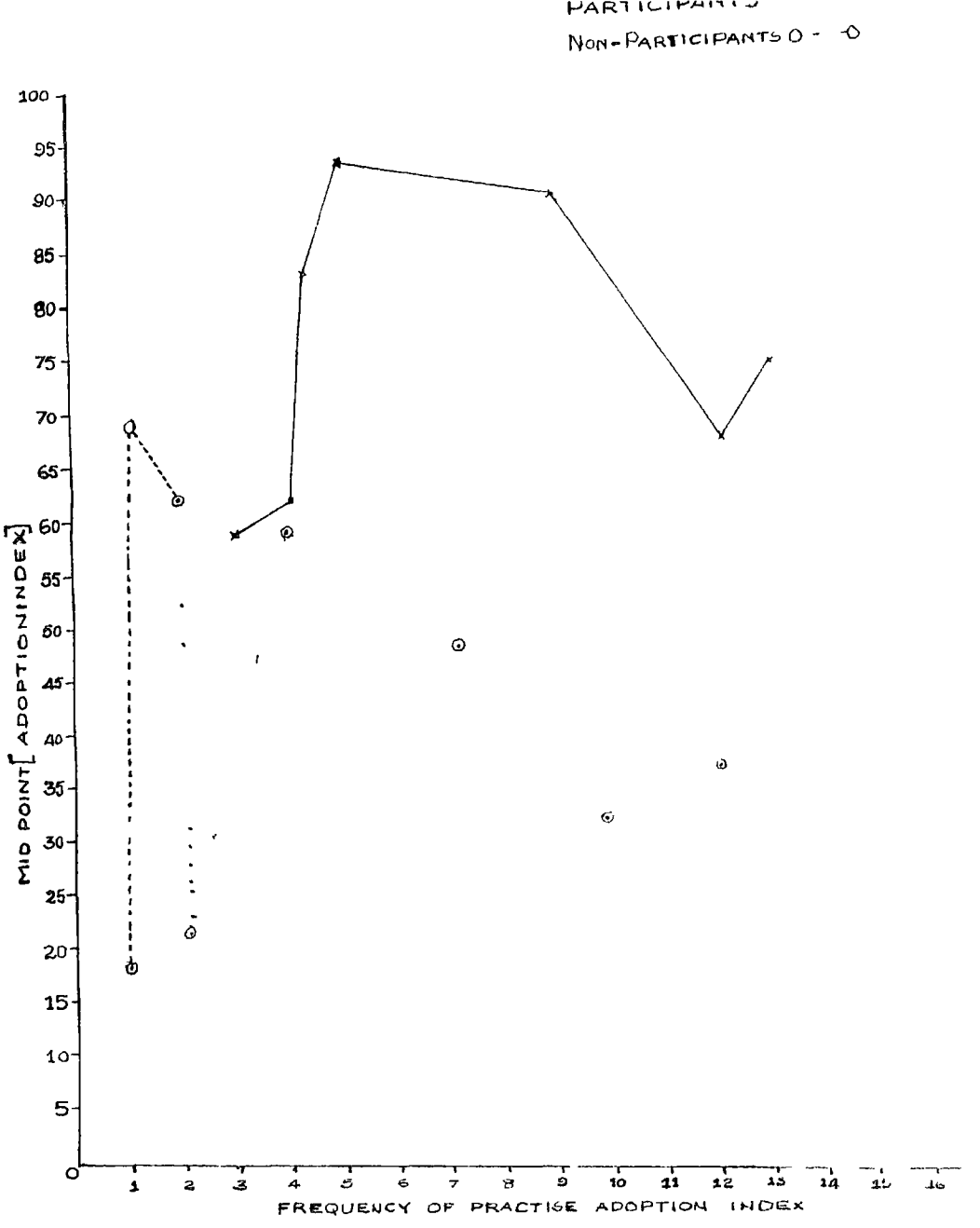


Fig. 6. FREQUENCY OF PRACTISE ADOPTION INDEX OF PARTICIPANTS AND NON-PARTICIPANTS

4(c) Extent of adoption of individual practices

Practice 1

Artificial insemination of animals

Of the participants, 92 per cent had fully adopted this practice whereas the remaining 8 per cent partially adopted it.

In case of non-participants, only 28 per cent fully adopted the practice, 48 per cent partially adopted this and 24 per cent had not adopted the practice. These findings are given as bar graph in figure 7.

The proportionate significant test revealed significant Z values of 4.13, 3.78 and 3.46 ($P<0.01$), respectively for the full, partial and non-adopters in the participant and non-participant groups. This is given in table 10.

The principal reason endured by the participants for the non-adoption was the lack of service facility.

Table 10. Extent of adoption of artificial insemination of animals by the participants and non-participants

n = sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	46	92	14	28	4.13*
Partial	4	8	24	48	3.78*
Non-adoption	0	0	12	24	3.46*

* Significant at one per cent level

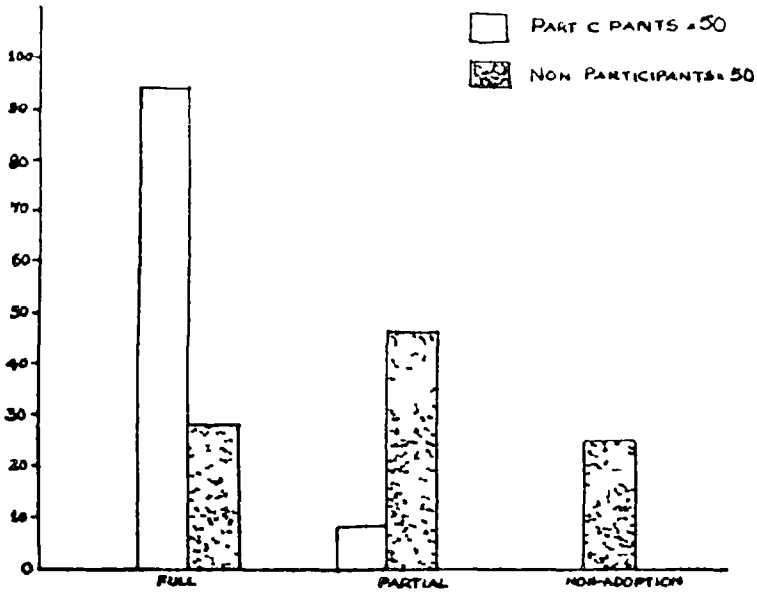


Fig. 7. ADOPTION BEHAVIOUR OF THE PRACTISE OF ARTIFICIAL INSEMINATION OF ANIMALS

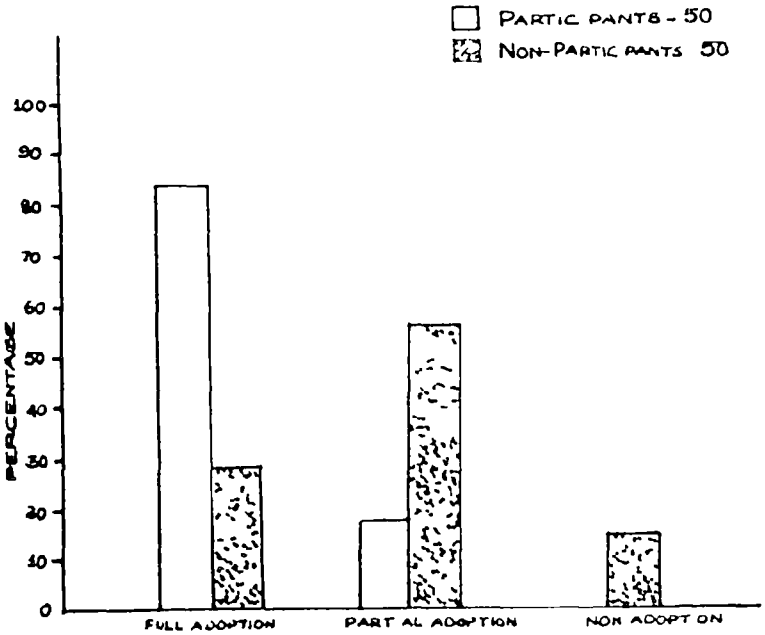


Fig 8. ADOPTION BEHAVIOUR OF THE PRACTISE OF FEEDING COMMERCIAL CATTLE FEED

Practice 2. Feeding commercial cattle feed

Majority of the participants (82 per cent) fully adopted this practice and 18 per cent adopted it partially. Of the non-participants only 28 per cent fully adopted the practice and 58 per cent did adopt it, but partially. There was 14 per cent who had not adopted this practice. The Z values obtained by the proportionate significant test were significant at one per cent level. They were found to be 3.64, 3.24 and 2.65 respectively for the full, partial and non-adopters of participant and non-participant groups. This data is given in table 11 and is presented as graph in figure 8.

The reasons attributed by the partial adopters of the participant group mainly points at the unavailability of quality feed at reasonable price.

Table 11. Extent of adoption of feeding commercial cattle feed by the participants and non-participants

n= sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	41	82	14	28	3.64*
Partial	9	18	29	58	3.24*
Non-adoption	0	0	7	14	2.65*

* Significant at one per cent level

Practice 3. Feeding colostrum to calves

Interestingly, as the table 12 reveals all the participants had fully adopted this practice. Majority of the

non-participants (92 per cent) had fully adopted this practice.whereas a meagre number (8 per cent) had partially adopted the practice. This is given in figure 9.

The Z value 2 ($P<0.05$) of partial adoption between the participants and the non-participants was significant, whereas the Z value of 0.28 ($P<0.05$) of full adoption was not significant.

Table 12. Extent of adoption of feeding colostrum to calves by the participants and non-participants

n = sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	50	100	46	92	0.28 NS
Partial	-	-	4	8	2.0*
Non-adoption	-	-	-	-	-

NS - Non-significant * Significant at 5 per cent level

Practice 4. Early breeding practice

Of the participants 74 per cent fully adopted this practice, followed by 22 per cent who resorted to partial adoption and 4 per cent were yet to practically adopt this practice.

Majority of the non-participants (60 per cent) were partial adopters of this practice followed by 30 per cent non-adopters and 10 per cent full adopters. The findings are recorded as graph in figure 10.

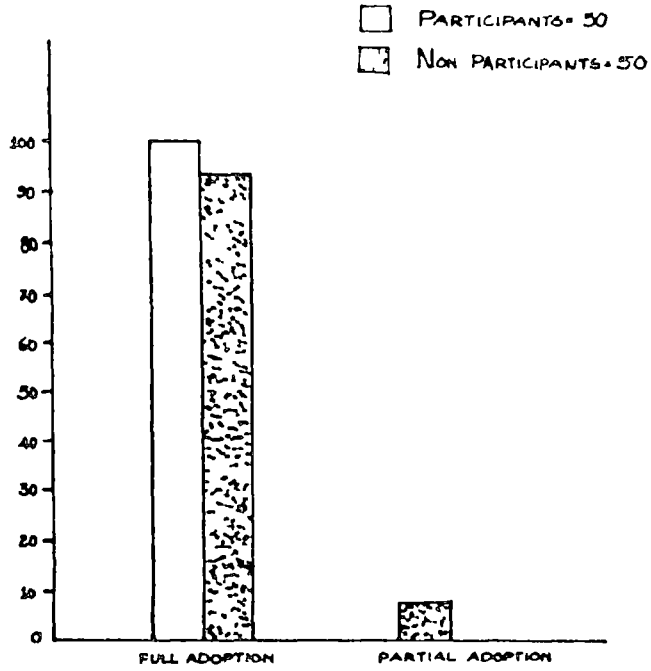


Fig 9 ADOPTION BEHAVIOUR OF THE PRACTISE OF FEEDING OF COLOSTRUM TO CALVES IN INITIAL DAYS

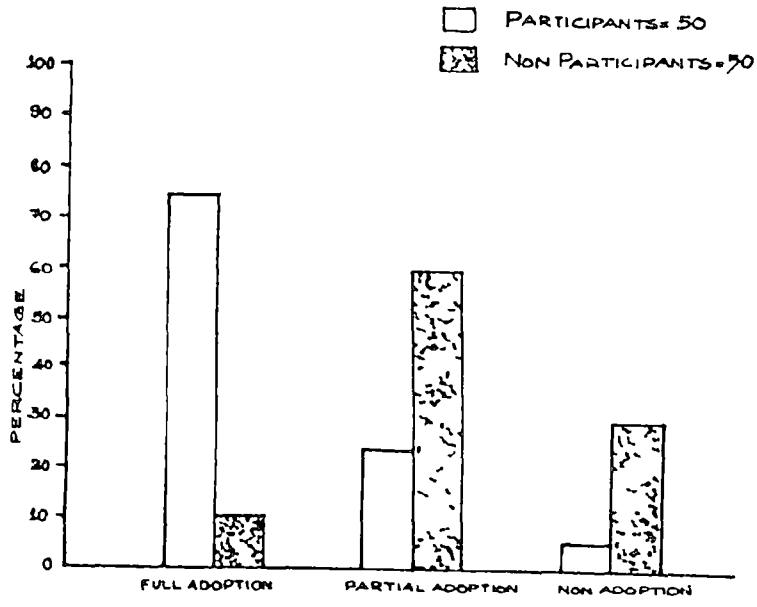


Fig 10 ADOPTION BEHAVIOUR OF THE PRACTISE OF EARLY BREEDING

Frequency values of full, partial and non-adopters of the participants and non-participants categories were tested for proportionate significance and the Z values obtained were 4.94, 2.97 and 3.15 respectively, which were found significant ($P<0.01$). This is given in table 13.

The major reasons given by the participant partial adopters of this practice was the observance of late heat symptoms and lack of service facility. The participant non-adopters were yet to practically adopt this practice for the fear on their part of possible reduction in milk yield if bred within a few months after calving.

Table 13. Extent of adoption of early breeding practice by the participants and non-participants

n = sample size

Extent of adoption	Participants		Non-participants		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	37	74	5	10	4.94*
Partial	11	22	30	60	2.97*
Non-adoption	2	4	15	30	3.15*

* Significant at one per cent level

Practice 5. Preventive vaccinations in animals

This practice had 24 (48 per cent) full adopters and 26 (52 per cent) partial adopters among the participants.

Incidentally the same number of partial adopters 26 (52 per cent) were noticed in the non-participant group. There were 22 (44 per cent) non-adopters and 2 (4 per cent) full adopters of this practice in the non-participant group. These findings are summarised in figure 11.

Significant Z values of 4.8 and 4.69 were obtained ($P<0.01$) between the participant and non-participant groups for the full and non-adopters respectively. These details are presented in table 14.

Non-availability of the vaccines and lack of service personnels were the two reasons accounted for the partial adoption of this practice by the participants.

Table 14. Extent of adoption of preventive vaccinations by the participants and non-participants.

n = sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	24	48	2	4	4.8*
Partial	26	52	26	52	-
Non-adoption	0	0	22	44	4.69*

* Significant at one per cent level

Practice 6. Mild antiseptic washing of udder after milking

This was a practice which had maximum number of non-adopters 40 (80 per cent) among the participants. Of the remaining participants seven (14 per cent) were partial adopters and three (six per cent) full adopters of the practice. The findings are presented in figure 12.

All the non-participants (100 per cent) were non-adopters of this practice. These data are summarised in table 15.

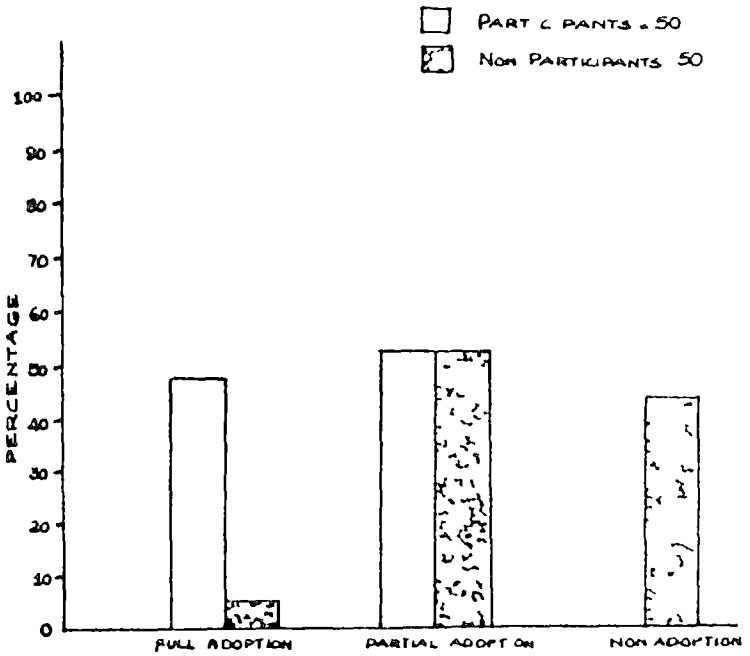


Fig 11 ADOPTION BEHAVIOUR OF THE PRACTICE OF PREVENTIVE VACCINATION

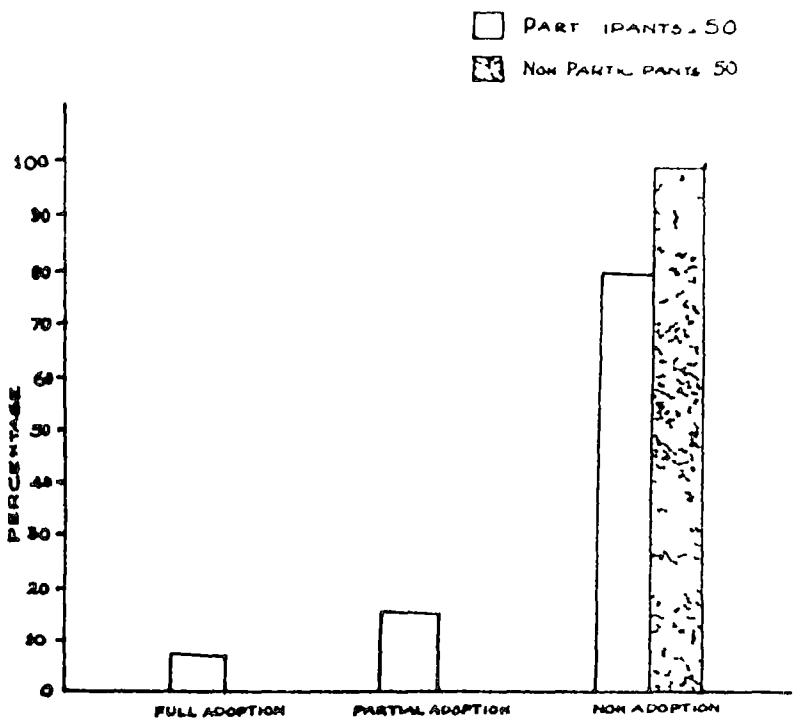


Fig 12 ADOPTION BEHAVIOUR OF THE PRACTICE OF WASHING UDDER WITH MILD ANTISEPTICS AFTER MILKING

When the participants and non-participants groups were tested for proportionate significance of full and non-adopters non-significant Z values of 1.23 and 1.05 respectively were obtained . For the partial adopters a significant Z value of 2.65 ($P < 0.01$) was obtained.

The major reasons for non-adoption of this practice by the participants was given as lack of time. Majority of the milkers wanted to finish off the milking at the earliest. If they had to adopt the above practice, more time was necessary, which they considered was not worth the time. Although some participants adopted it in the beginning, they discontinued the practice for lack of faith in the practice.

Table 15. Extent of adoption of mild antiseptic washing of udder after milking by the participants and non-participants

n = sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	3	6	-	-	1.73 NS
Partial	7	14	-	-	2.65*
Non-adoption	40	80	50	100	1.05 NS

* Significant at one per cent level
NS Non-significant

Practice 7. Full hand milking

Of the participants 19 (38 per cent) were full adopters of the practice, followed by 16 (32 per cent) non-adopters.

The remaining 15 (30 per cent) participants partially adopted the practice.

As the table 16 reveals, majority of the non-participants, 49 (98 per cent) were non-adopters of this practice whereas one (two per cent) adopted it partially. These findings are represented as bar graph in figure 13.

The Z values obtained by proportionate significance test revealed significant values of 4.36, 3.50 and 4.09 ($P<0.01$) for the full, partial and non-adopters of the participant and non-participant groups.

Participant non-adopters of this practice revealed that this was time consuming and strenuous practice. Moreover, they had the belief that through full hand milking only a less quantity could be obtained.

The partial adopters were those who changed the patterns during milking. They practised thumbing and stripping along with full hand milking.

Table 16. Extent of adoption of full hand milking by the participants and non-participants

n = sample size

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	19	38	-	-	4.36*
Partial	15	30	1	2	3.50*
Non-adoption	16	32	49	98	4.09*

* Significant at one per cent level

Practice 8. Deworming of calves

Majority of the participants 47 (94 per cent) were full adopters of this practice, whereas only three (six per cent) were partial adopters.

Of the non-participants majority 38 (76 per cent) were partial adopters, followed by 9 (18 per cent) full adopters and three (six per cent) non-adopters. These findings are summarised in Figure 14.

While significant Z values of 5.08 and 5.47 ($P<0.01$) respectively for full and partial adoption were obtained between the participant and non-participant groups the non-adoption groups showed a non-significant Z value of 1.73. This findings are given in Table 17.

The reasons attributed by the participants for the partial adoption was the unavailability of service personnel.

Table 17. Extent of adoption of deworming of calves by the participants and non-participants

Extent of adoption	Participants (n=50)		Non-participants (n=50)		Z value
	Frequency	Per cent	Frequency	Per cent	
Full	47	94	9	18	5.08*
Partial	3	6	38	76	5.47*
Non-adoption	-	-	3	6	1.73 NS

* Significant at five per cent level
NS-Non-significant

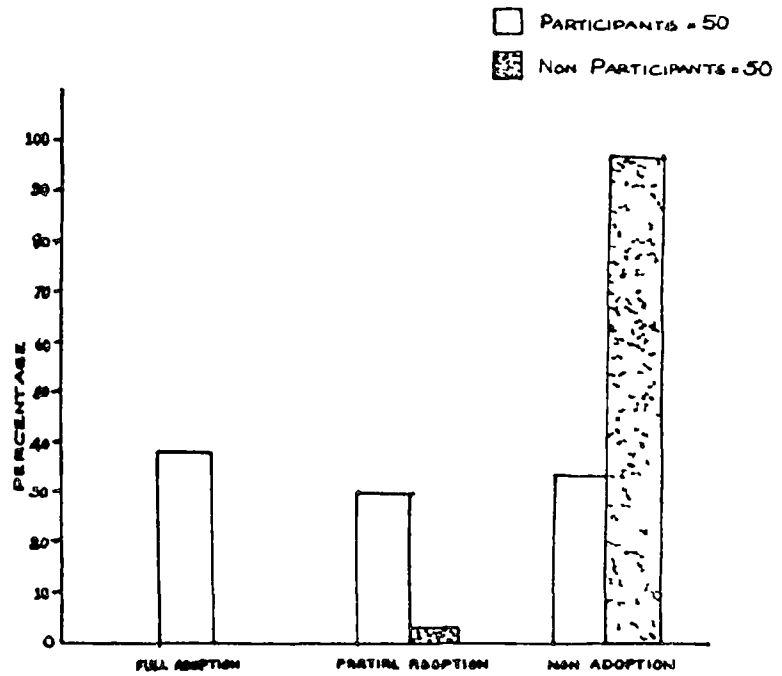


Fig 13 ADOPTION BEHAVIOUR OF THE PRACTISE OF FULL HAND MILKING

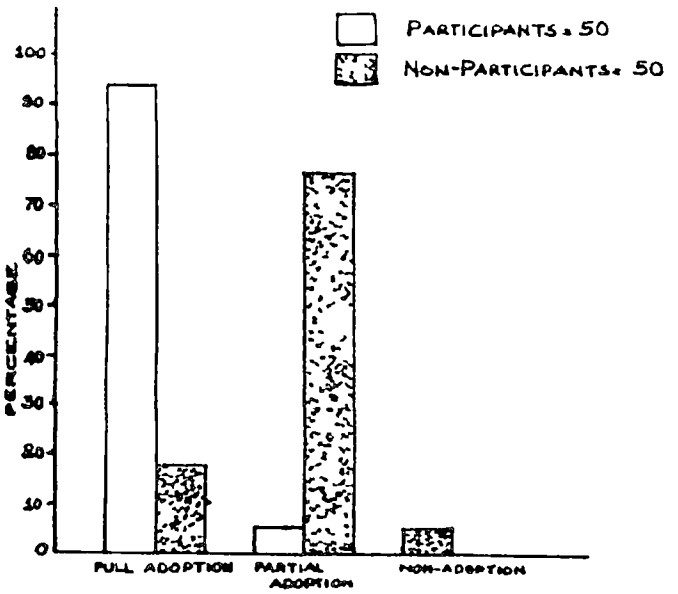


Fig. 14. ADOPTION BEHAVIOUR OF THE PRACTISE OF TIMELY DEWORMING OF CALVES

5. Influence of socio-psychological and economic characters of participants on the adoption of improved dairy management practices

Age

The participants were categorised as young, middle and old, using mean and standard deviation of the values of their chronological age. Participants with age 36 and below (22 per cent) were grouped as young, those in the age group of 37-56 as middle (60 per cent) and above 56 as old (16 per cent). The association of age with extent of practice adoption was as shown in table 18.

High adopters were almost uniformly distributed among the three age categories. Majority of the middle age group (66 per cent) were medium adopters. Incidentally there was no low adopters in the old age group.

The chisquare valued 5.77 was not significant (P 0.05).

Table 18. Association between age and extent of practice adoption of participants

n=50

Age	Extent of adoption		
	Low	Medium	High
Young	3	4	4
Middle	4	20	6
Old	0	5	4

Mean = 46.04 SD = 10.36

χ^2 = 5.77 N.S. d.f (4)

Education:

The participants were categorised into those with middle school education (14 per cent), those with high school education (66 per cent) and those with college education (20 per cent). The association of education with extent of adoption was as shown in table 19.

It is evident that majority of the participants(86 per cent) were educated at the high school above. Interestingly of the 50 per cent of the low adopters were college educated and majority the high adopters (71.4 per cent) were high school educated.

It was less likely for education to have much of an association with practise adopters as revealed by the non-significant chisquare value of 7.56 ($P<0.05$).

Table 19. Association between education and extent of practise adoption of participants

n=50

Education	Extent of adoption		
	Low	Medium	High
Middle School	2	3	2
High School	1	22	10
College	3	5	2

Mean = 3.06 SD = 0.59

χ^2 = 7.56 NS d.f. (4)

Annual income:

The participants were categorised into those with income upto Rs.9700/- (34 per cent),and those with income between

Rs.9700 and Rs.21,500 (66 per cent), based on the annual income from all sources and using the mean and standard deviations of the income. There were no participants with an income above Rs.21,500. Thus among the participants studied those relatively poor were proportionately, small. The association of income with extent of adoption was as shown in the table 20.

The high adopters and low adopters were almost uniformly distributed in the two categories of income, whereas 72.4 per cent of the medium adopters were in the income range between Rs.9701/- and Rs.21,500/-. The chi-square value of 1.27 ($P<0.05$) indicated the absence of any association between the annual income of participants and their extent of adoption.

Table 20. Distribution of participants according to annual income and extent of practise adoption

n=50

Annual income	Extent of adoption		
	Low	Medium	High
Upto Rs.9700/-	3	8	6
Between Rs.9701-21500	4	21	8

Mean = 15,632 SD = 5929.57

χ^2 = 1.27 NS d.f.(2)

Family size:

Based on the total number of members in the family, the participants were categorised into those with small family

size (4 members and below), medium size (5 to 7 members) and large sized (8 and above), each category comprising of 26, 56 and 18 percentages of adopters respectively. The association of family size with extent of adoption was as shown in the table 21.

As the table reveals, 78.5 per cent of high adopters were those with medium and small family size. Majority of medium adopters (72.4 per cent) were those possessing a medium family size. The adopters with large family size were uniformly distributed (with 33.3 per cent) among the three adopter categories.

The chi-square value obtained (9.21) was found to be insignificant ($P<0.05$).

Table 21. Distribution of participants according to family size and extent of practise adoption

n=50

Members in families	Extent of adoption		
	Low	Medium	High
Small	2	5	6
Medium	2	21	5
Large	3	3	3

Mean = 6.02 SD = 2.04

χ^2 = 9.21 NS d.f.(4)

Herd size

The participants were categorised into three groups, based on the total number of dairy animals possessed by them as those

with small herds (2 animals and below), medium herds (3-5 animals) and large herds (6 and above), the adopters in those three categories being 12, 76 and 12 percentages respectively. The association of herd size with extent of adoption was shown in table 22.

Of the high adoption group, 57 per cent were possessing medium herd size. Majority of medium adopters (86.2 per cent) were those who possessed medium herd size. No significant association could be found out, which was revealed by the non-significant chi-square value (6.23).

Table 22. Distribution of participants according to herd size and extent of practise adoption

n=50

Herd size	Extent of adoption		
	Low	Medium	High
Low	1	3	2
Medium	5	25	0
High	1	1	4

Mean = 3.96 SD = 1.29

χ^2 = 6.23 NS d.f.(4)

Social participation

Based on their degree of participation, participants were categorised into three groups, viz., low participation (with score 1 and below), medium participation (with score 2-3) and high participation (with score above 3), and the per cent of participants in those three categories were

respectively 18.54 and 28. The association of social participation and extent of adoption was as shown in table 23.

Majority of the high adopters (71.4 per cent) were having medium social participation. Majority of participants with high social participation (64.3 per cent) were medium adopters.

The chi-square value of 3.79 was not significant ($P<0.05$).

Table 23. Distribution of participants according to social participation and extent of practise adoption

n=50

Social participation	Extent of adoption		
	Low	Medium	High
Low (1 and below)	2	5	2
Medium (2-3)	2	15	10
High (above 3)	3	9	2

Mean = 2.68 SD = 1.35

χ^2 = 3.79 NS d.f.(4)

Economic motivation

Based on the economic motivation scores, the participants were categorised into those with low, medium and high economic motivation. Those who had scores 6-21 were condensed as low (16 per cent) (22-24) as medium (68 per cent) and above 24 as high (16 per cent) economic motivation. The association between economic motivation and extent of adoption of participants was as shown in table 24.

Table 24. Distribution of participants according to economic motivation and extent of practise adoption

n=50

Economic motivation	Extent of adoption		
	Low	Medium	High
Low (6-21)	5	3	0
Medium (22-24)	2	25	7
High (above 24)	0	1	7

Mean = 23.04 SD = 1.35

χ^2 = 34.03 Significant ($P<0.05$) d.f.(4)

Evidently there was no high adopters with low economic motivation. Only 10 per cent of the medium adopters had low economic motivation. Majority of the medium adopters (86.2 per cent) possessed medium economic motivation and there was no low adopters with high economic motivation. The overall distribution is suggestive of possible association between economic motivation and extent of adoption. The chi-square value obtained (34.03) was found to be significant ($P<0.05$).

Scientific orientation

Participants with a score of 6-22 (26 per cent) were considered to have low, those with score 23-27 (54 per cent) as having medium and those with scores 28 and above (20 per cent) as having high scientific orientation. The association between scientific orientation and extent of adoption of participants was as shown in table 25.

Table 25. Distribution of participants according to their degree of scientific orientation and extent of practise adoption

n=50

Scientific orientation	Extent of adoption		
	Low	Medium	High
Low (below 22)	7	6	0
Medium (23-27)	0	20	7
High (above 28)	0	2	8

Mean = 25.66 SD = 1.72

χ^2 = 36.42 Significant ($P<0.05$) d.f.(4)

The distribution within the different adoption categories was dominated by those with medium scientific orientation. There was no participant with low scientific orientation, in the high adoption category, and interestingly no participants with medium and high scientific orientation could be spotted in the high and medium adopter groups. Majority of participants (80 per cent) having high scientific orientation were high adoptors also. Of the medium adopters, 71.4 per cent participants possessed medium scientific orientation. The chi-square value of 36.42 (P 0.05) was significant indicating the presence of an association between the scientific orientation and the extent of adoption.

Risk preference

Based on their risk preference, participants were categorised into three groups viz., those with score between

6-21, were considered as low (16 per cent), those with scores between 22-23 as medium (62 per cent) and those with scores above 23 as high (22 per cent). The association between risk performance and extent of adoption was as shown in table 26.

High adopters were scattered in the medium and high risk performance groups. Of the medium adopters 58 per cent possessed medium risk performance. There was no participants with high risk performance, in the low adopter group.

The association between the two variables appeared to be negligible as revealed by the chi-square value of 6.46, which was non-significant ($P<0.05$).

Table 26. Distribution of participants according to risk preference and extent of practise adoption

Risk preference	Extent of adoption		
	Low	Medium	High
Low (6-21)	1	7	0
Medium (22-23)	5	18	8
High (above 23)	0	6	5

Mean = 22.4 SD = 1.34

χ^2 = 6.46 NS d.f. = 4

Cosmopoliteness

The participants were categorised into low and high cosmopolite groups based on their mean score. Those with score of above 17 were considered as high (24 per cent) and

those with score of 17 and below were considered as low (76 per cent). The association between cosmopoliteness and extent of adoption is given in table 27.

Majority of the participants who were low cosmopolite (65.8 per cent) were medium adopters. The chi-square value was only 3.79 and was not significant ($P<0.05$), which explained negligible association between cosmopoliteness and extent of adoption.

Table 27. Distribution of participants according to degree of cosmopoliteness and extent of practise adoption

Cosmopoliteness	Extent of adoption		
	Low	Medium	High
Low (17 and below)	5	25	8
High (above 17)	1	5	6

Mean = 16.86 SD = 1.39

χ^2 = 3.79 NS d.f. = 2

6. Comparison of symbolic and practise adoption of the participants of improved dairy management practices and reasons for absence of full adoption of improved dairy management practices

The frequency percentage of symbolic adoption and practice adopters are given practicewise in table 28.

The practice of artificial insemination was symbolically adopted by all the participants and was fully adopted by 92 per cent whereas only eight per cent partially adopted it.

The reason attributed by the participants for the partial adoption was the unavailability of service facility.

The practice of feeding commercial cattle feed was symbolically adopted by all the participants. With regard to the practise adoption, 82 per cent adopted the practice fully whereas 18 per cent were partial adoptors. These partial adopters gave the reason of unavailability of quality feed at reasonable price for such a type of adoption.

The practice of feeding colostrum to calves in initial days was symbolically adopted by all the participants and all of them were full adopters.

The practice of early breeding practice was symbolically adopted by all the participants. But this practice had four percent non-adopters and 22 per cent partial adopters. The major reasons given by the participant partial adopters of this practice was the observance of late heat symptoms and lack of service facility. The participant non-adopters were yet to practically adopt this practice for the fear on their part of possible reduction in milk yield if bred within a few months after calving.

The practice of preventive vaccination was symbolically adopted by all the participants. In the case of practice adoption 48 per cent were full adopters and 52 per cent partial adopter. Non-availability of the vaccines and lack of service personnels were the two reasons accounted for by the partial adopters.

Table 28. Distribution of participants according to their symbolic and practise adoption of different practices

Practice	Symbolic adoption		Practise adoption					
			Full adoption		Partial adoption		Non-adoption	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Artificial insemination of animals	50	100	46	92	4	8	-	-
Feeding commercial cattle feed	50	100	41	82	9	18	-	-
Feeding colostrum to calves	50	100	50	100	-	-	-	-
Early breeding practice	50	100	37	74	11	22	2	4
Preventive vaccinations	50	100	24	48	26	52	-	-
Mild antiseptic washing of udder after milking	39	78	3	6	7	14	40	80
Full hand milking	45	90	19	38	15	30	16	32
Deworming of calves	50	100	47	94	3	6	-	-

The practice of mild antiseptic washing of udder after milking was symbolically adopted by only 70 per cent of the participants. The practice had 80 per cent non-adopters and 14 per cent partial adopters. Only 6 per cent fully adopted this practice. The major reason for symbolically not adopting the practice by the participants was given as lack of time. Majority of the milkers wanted to finish off milking at the earliest. The adoption of the above practice, demand for more time, which they consider was not worth the practice. Although some participants adopted it in the beginning, they discontinued the practice for lack of faith in the practice.

The practice of full hand milking was symbolically adopted by 90 per cent participants. Thirty-eight per cent were full adopters of the practice, followed by 32 per cent non-adoptors. The remaining 30 per cent participants partially adopted the practice. They had not symbolically adopted the practice for they considered this as time consuming and strenuous. Participant practise non-adopters, did not adopt the practice for the belief that this type of milking yielded only less quantity of milk. The partial adopters were those who changed the patterns, during milking. They practised thumbing and stripping along with full hand milking.

The practice of timely deworming of calves was symbolically adopted by all the participants. Majority of the participants (94 per cent) fully adopted the practice whereas six per cent adopted it partially. There were no non-adopters.

The reason attributed by the participants for the partial adoption was unavailability of service personnels.

Correlation between the various independent variables and the extent of adoption

The correlations between the ten selected independent variables and the extent of adoption by the participants were as shown in table 29 and is represented in figure 15.

Table 29. Correlation between selected independent variables and the extent of adoption of practices

Sl. No.	Independent variables	Coefficient of correlation (r)
1	Age	0.0680 NS
2	Education	-0.056 NS
3	Annual income	-0.0009 NS
4	Family size	-0.3542*
5	Herd size	0.0431 NS
6	Social participation	0.0439 NS
7	Economic motivation	0.7499**
8	Scientific orientation	0.7678**
9	Risk preference	0.4033**
10	Cosmopoliteness	-0.1568 NS

** Significant at one per cent level
* Significant at five per cent level
NS- Non-significant

An examination of the correlation-coefficients unfolds the significant and positive correlation between the extent adoption of improved dairy practices by the participants and

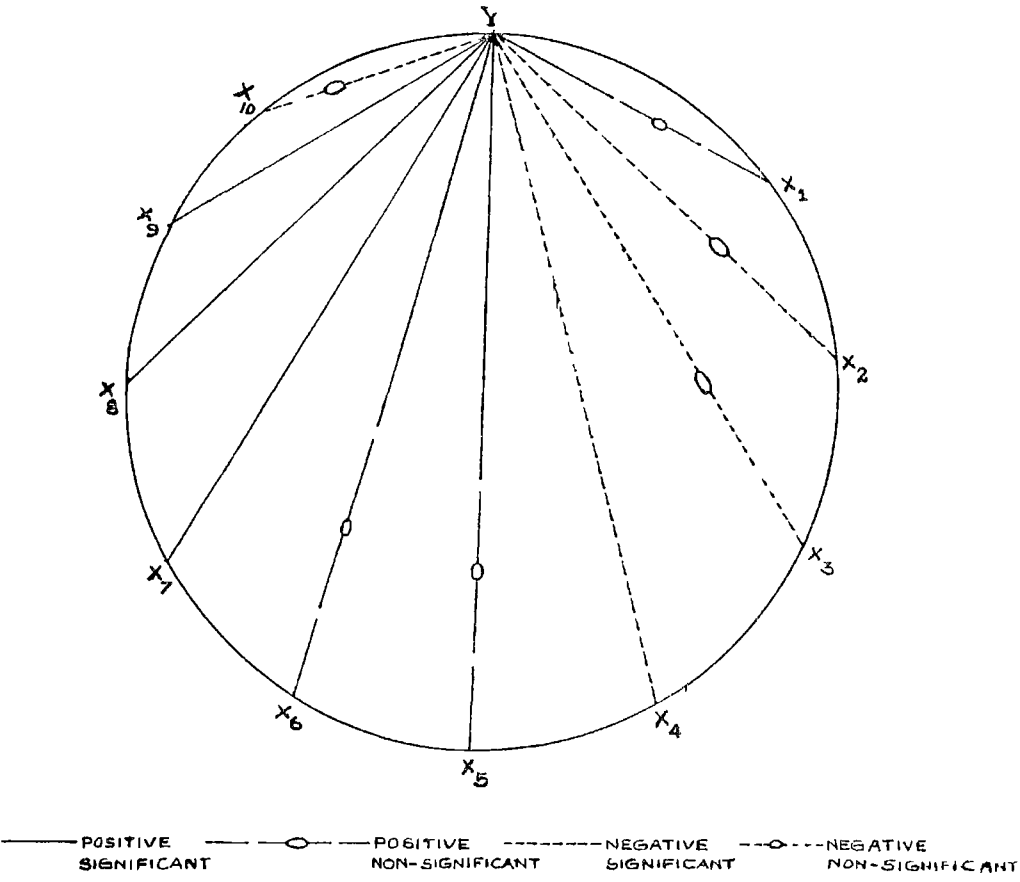


Fig.15. DIAGRAMATIC REPRESENTATION OF CORRELATION BETWEEN PRACTISE ADOPTION AND THE INDEPENDENT VARIABLES

their economic motivation, scientific orientation and risk preference. There was also significant but negative correlation between the family size of the participants and their extent of adoption of selected improved dairy practices.

The results of intercorrelation between the different independent variables are furnished in table 30.

Regression analysis

All the independent variables were subjected to regression analysis. The variation due to regression was tested by analysis of variance and the results are presented in table 31.

The regression analysis indicated that the 10 selected independent variables jointly explained 79 per cent of variation in the practise adoption of improved dairy practices by the participants. The computed F-ratio was significant at one per cent level of probability, indicating that the selected independent variables significantly influenced the adoption behaviour of participants.

The fitted equation was

$$Y = -0.0028 + 0.0112\ x_1 + 0.0209\ x_2 - 0.1053\ x_3 - 0.1269\ x_4 - 0.0395\ x_5 + 0.00833\ x_6 + 0.4242\ x_7 + 0.4857\ x_8 + 0.0917\ x_9 - 0.000124\ x_{10} + 0.5381$$

Partial regression coefficients (b), corresponding t values and their significance are shown in table 32.

Table 30. Interrelationship between personal, socio-psychological and economic character variables

tri-tes	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
1	1.000	-0.2493	0.1674	0.1956	0.4589**	0.0443	0.0155	0.2407	0.2077	0.1327
2		1.0000	-0.1732	-0.2406	-0.0302	-0.0010	-0.1916	-0.0627	0.0468	-0.1403
3			1.0000	-0.1981	-0.0523	0.0352	0.1132	0.1035	-0.0852	0.1707
4				1.0000	0.3648**	0.2232	-0.1766	-0.1120	-0.0180	-0.0279
5					1.0000	0.1664	0.0962	0.1428	0.1979	0.1677
6						1.0000	-0.0517	0.1522	0.1051	0.1056
7							1.0000	0.5691**	0.3106*	0.2785
8								1.0000	0.3061*	0.4480**
9									1.0000	0.0198
10										1.0000

* Significant at five per cent level ** Significant at one per cent level

x_1 = Age, x_2 = Education, x_3 = Annual income, x_4 = Family size

x_5 = Herd size, x_6 = Social participation, x_7 = Economic motivation

x_8 = Scientific orientation, x_9 = Risk preference, x_{10} = Cosmopolitaness

Table 31. ANOVA of multiple regression

Sources	df	Sum of Squares	MSS	F
Regression	10	39.53	3.953	14.42*
Error	39	10.69	0.274	
Total	49	50.22		

* Significant at one per cent level

Multiple correlation coefficient = R^2 = 0.787

Table 32. Partial regression coefficients for independent variables (Practise adoption-dependent variable)

Sl. No.	Variable No.	Variables (x_i)	Partial Regression Coefficient (b)	Standard Error (SE)	t value
1	x_1	Age	0.0112	0.0970	0.1146 NS
2	x_2	Education	0.0208	0.0846	0.2466 NS
3	x_3	Annual income	-0.1052	0.0796	1.3209 NS
4	x_4	Family size	-0.1269	0.0836	1.5169 NS
5	x_5	Herd size	-0.0395	0.0924	0.4271 NS
6	x_6	Social participation	0.0083	0.0810	0.1028 NS
7	x_7	Economic motivation	0.4241	0.1028	4.1256*
8	x_8	Scientific orientation	0.4856	0.0997	4.3706*
9	x_9	Risk preference	0.0917	0.0871	1.0528 NS
10	x_{10}	Cosmopolitoness	-0.00012	0.000028	1.3319 NS

* Significant at one per cent level. NS = Non-significant

Results of Path analysis

The objective of doing path analysis was go get clear picture of the direct and indirect effects of the selected independent variables on the practise adoption of improved dairy practices. Path analysis showing the direct and indirect effect of the selected independent variables on extent of adoption is furnished in table 33. The data presented in table 34 gives the direct and the substantial indirect effects of the independent variables on the practise adoption of improved dairy practice. To obtain a clear idea of the variables through which indirect effects of other variables are channelled, diagramatic representation is done in figure 16.

Age had a direct effect of 0.0327 and its substantial indirect effects were -0.028 through annual income, -0.023 through family size, -0.030 through herd size, 0.134 through scientific orientation and 0.010 through risk preference.

Education had a direct effect of 0.0097 and its substantial indirect effects were 0.029 through annual income, 0.029 through family size and -0.083 through economic motivation and -0.035 through scientific orientation.

Annual income had a direct effect of -0.1672 and its substantial indirect effects were 0.013 through family size, 0.049 through economic motivation and 0.058 through scientific orientation.

Table 33. Path Analysis showing the direct and indirect effects of the selected independent variables on extent of adoption

	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}	Path correlation
x_1	0.033	-0.002	-0.028	-0.023	-0.030	0.001	0.002	0.134	0.010	-0.005	0.095
x_2	-0.008	0.010	0.029	0.029	-0.002	-0.000	-0.083	-0.035	0.002	0.006	-0.053
x_3	0.005	-0.002	-0.167	0.013	0.003	0.001	0.049	0.058	-0.004	-0.002	-0.051
x_4	0.006	-0.002	0.018	-0.119	-0.024	0.005	-0.076	-0.063	-0.001	0.001	-0.254
x_5	0.015	0.000	0.009	-0.043	-0.065	0.004	0.042	0.080	0.010	-0.007	0.043
x_6	0.001	-0.000	-0.006	-0.026	-0.011	0.022	-0.022	0.085	0.005	-0.004	0.044
x_7	0.001	-0.002	-0.019	0.021	-0.006	0.001	0.433	0.317	0.015	-0.011	0.747
x_8	0.008	-0.001	-0.017	0.013	-0.009	0.003	0.246	0.557	0.015	-0.018	0.797
x_9	0.007	0.000	0.014	0.002	-0.013	0.002	0.134	0.171	0.048	-0.001	0.365
x_{10}	0.004	-0.001	-0.029	0.003	-0.011	0.002	0.121	0.250	0.001	-0.141	0.299

Table 34. Direct and indirect effects of personal socio-psychological and economic factors of the participants on their extent of practise adoption of selected improved dairy practices

Sl. No.	Variables	Total direct effect	Substantial indirect effect
1	2	3	4
1	Age	0.0327	-0.028 through annual income -0.023 through family size -0.030 through herd size 0.134 through scientific orientation 0.010 through risk preference
2	Education	0.0097	0.029 through annual income 0.029 through family size -0.083 through economic motivation -0.055 through scientific orientation
3	Annual income	-0.1672	0.013 through family size 0.049 through economic motivation 0.058 through scientific orientation
4	Family size	-0.1182	0.018 through annual income -0.024 through herd size -0.076 through economic motivation -0.063 through scientific orientation
5	Herd size	-0.0652	0.015 through age -0.043 through family size 0.042 through economic motivation 0.080 through scientific orientation 0.010 through risk preference
6	Social participation	0.0224	-0.026 through family size -0.011 through herd size -0.022 through economic motivation 0.085 through scientific orientation

(contd.)

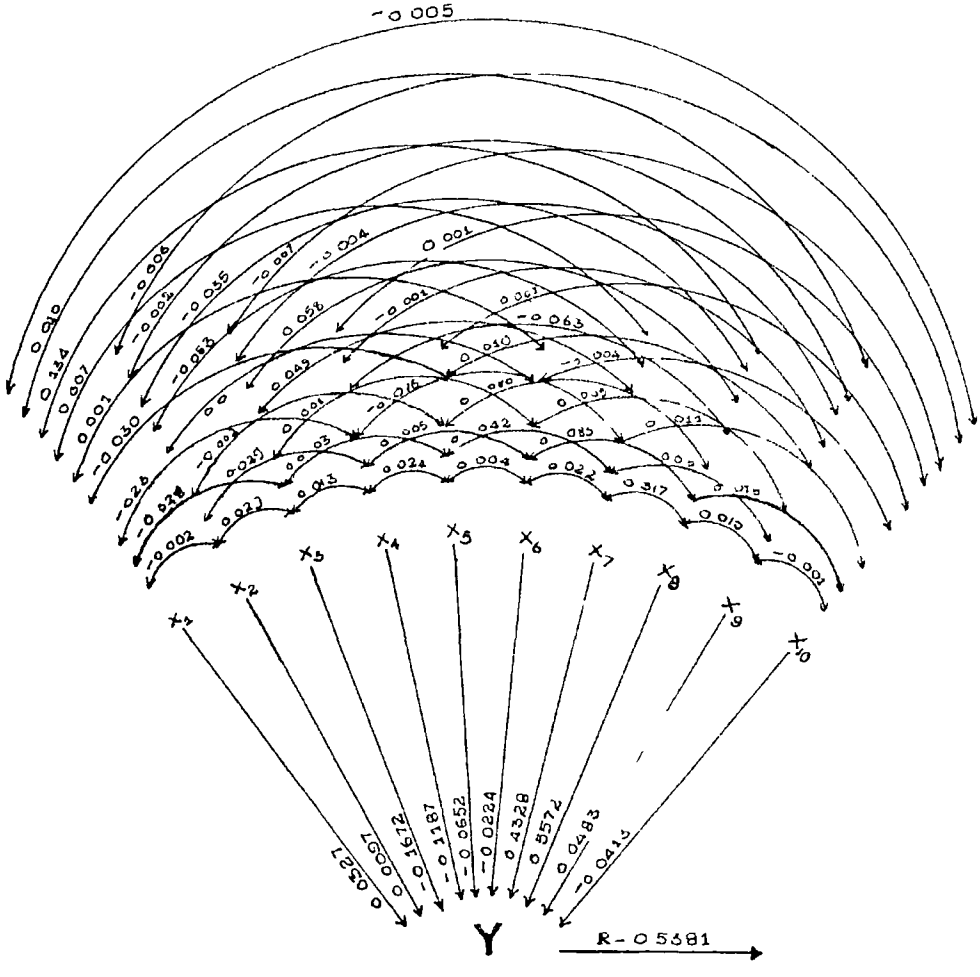
1	2	3	4
7	Economic motivation	0.4328	-0.019 through annual income -0.021 through family size 0.317 through scientific orientation 0.015 through risk preference -0.018 through cosmopoliteness
8	Scientific orientation	0.5572	-0.017 through annual income 0.013 through family size 0.246 through economic motivation 0.015 through risk preference -0.018 through cosmopoliteness
9	Risk preference	0.0483	0.014 through annual income -0.013 through herd size 0.134 through economic motivation 0.171 through scientific orientation
10	Cosmopoliteness	-0.0413	-0.029 through annual income -0.011 through herd size 0.121 through economic motivation 0.250 through scientific orientation

Residual effect (R) = 0.5381

1	2	3	4
7	Economic motivation	0.4328	-0.019 through annual income -0.021 through family size 0.317 through scientific orientation 0.015 through risk preference -0.018 through cosmopoliteness
8	Scientific orientation	0.5572	-0.017 through annual income 0.013 through family size 0.246 through economic motivation 0.015 through risk preference -0.018 through cosmopoliteness
9	Risk preference	0.0483	0.014 through annual income -0.013 through herd size 0.134 through economic motivation 0.171 through scientific orientation
10	Cosmopoliteness	-0.0413	-0.029 through annual income -0.011 through herd size 0.121 through economic motivation 0.250 through scientific orientation

Residual effect (R) = 0.5381

Fig. 16. Path diagram showing the direct and indirect effects of independent variables on extent of adoption



X_1	AGE	X_7	ECONOMIC MOTIVATION
X_2	EDUCATION	X_8	SCIENTIFIC ORIENTATION
X_3	ANNUAL INCOME	X_9	RISK PREFERENCE
X_4	FAMILY SIZE	X_{10}	COSMOPOLITENESS
X_5	HERD SIZE	Y	EXTENT OF ADOPTION
X_6	SOCIAL PARTICIPATION	R	RESIDUAL EFFECT

The direct effect for family size was -0.1182 and its substantial indirect effects were 0.018 through annual income, -0.024 through herd size, -0.076 through economic motivation and -0.063 through scientific orientation.

The direct effect of herd size was -0.0652 and its substantial indirect effects were 0.015 through age, -0.043 through family size, 0.042 through economic motivation and 0.080 through scientific orientation and 0.010 through risk preference.

Social participation had a direct effect of 0.0224 and its substantial indirect effects were -0.026 through family size, -0.011 through herd size, -0.022 through economic motivation and 0.085 through scientific orientation.

The direct effect of economic motivation was 0.4328 and its substantial indirect effects were -0.019 through annual income, -0.021 through family size, 0.317 through scientific orientation, 0.015 through risk preference and -0.011 through cosmopoliteness.

The direct effect of scientific orientation was 0.5572 and its substantial indirect effects were -0.017 through annual income, 0.013 through family size, 0.246 through economic motivation, 0.015 through risk preference and -0.018 through cosmopoliteness.

Risk preference had a direct effect of 0.0483 and its substantial indirect effects were 0.014 through annual

income, -0.013 through herd size, 0.134 through economic motivation and 0.171 through scientific orientation.

The direct effect of cosmopoliteness was -0.0413 and its substantial indirect effects were -0.029 through annual income, -0.011 through herd size, 0.121 through economic motivation and 0.250 through scientific orientation.

Discussion

practices, the fact that 26 per cent of them belong to the low knowledge level group cannot be neglected. Efforts have to be made to raise them to the medium or high knowledge level group. For this, the KAU can follow up the correspondence course by providing facilities for the reinforcement of the lessons. Moreover, opportunities should be provided for timely feedback from the participants.

Majority of the participants, (nearly three-fourth) had favourable attitude towards the improved dairy management practices. Of the remaining participants, approximately three-fourth had most favourable attitude and the remaining one-fourth had less favourable attitude towards the improved dairy management practices. This conclusion corroborates with the findings of Reddy and Reddy (1977), Balasubramaniam (1980) and Ravichandran (1980).

Of the non-participants, a high percentage (68 per cent) had less favourable attitude and the rest had only a favourable attitude towards improved dairy management practices.

This projects that exposure to correspondence course leads to a more favourable attitude towards improved dairy practices. The result agrees with the findings of Singh and Singh (1974), Pathak et al. (1979), Thangavelu (1979) and Kologi and Usha (1985) but does not coincide with the finding of Sinha and Sinha (1980).

The better favourable attitude of the participants towards improved dairy management practices directly indicated the

effective role of the correspondence course in better attitude formation. Only negligible number of participants were present in the less favourable group. But care has to be taken to improve their attitude; for, better attitude towards improved dairy practices can eventually guide the farmers towards a better acceleration in the attainment of a decision.

Approximately three-fourth of the total participants had high symbolic adoption whereas the remaining one-fourth were low symbolic adopters. Very high number (96 per cent) of non-participants were low symbolic adopters and the remaining four per cent were high adopters. Clear evidence of a better symbolic adoption by the participants than the non-participants may be attributed to the influence of the correspondence course in dairying on the participants. The participants who had undergone this course developed a mental willingness towards the adoption of a practice, due to the understanding of the scientific principles behind the necessity of adoption. This cognitive understanding of the practices would have developed as a result of the exposure of participants to this correspondence course. Still, the existence of the remaining few members of symbolic non-adopters cannot be overlooked, while formulating policies for development of the farmers. The reasons for such cognitive disapproval of practices have to be dealt with seriously. The reasons for such non-adoption is discussed along with adoption behaviour of individual practices, later in this section.

The picture of practise adoption behaviour of the participants showed that 60 per cent of them were medium adopters, 28 per cent high adopters and 12 per cent low adopters. This finding of the present studying agrees with the results obtained by Sohi and Kherde (1980) and Kologi and Usha (1985).

A high number of non-participants (98 per cent) were in the category of low practise adoption and the remaining two per cent constituted the medium adoption category.

This focuses the finding that the participants of the correspondence course were better practise adopters of the improved dairy practices than the non-adopters. This argument is confirmed in the studies of Singh and Singh (1974), Pathak et al. (1979) and Singh et al. (1985).

The participants practically adopted the practices owing to the privilege they acquired from the correspondence course.

Of the eight practices studied, feeding of colostrum to calves in initial days was fully adopted by all the participants. The above practice had no non-adopters in the non-participant group also, but in that group partial adoption was noticed among eight per cent. Keeping apart the negligant number of non-participant partial adopters, it is evident that the practice had been viewed with utmost seriousness, for it had an uniform adoption pattern among the participants and non-participants. Feeding of colostrum is an age old practice adopted by farmers and therefore the correspondence course had not exerted any specific favourable effect.

The practice of timely deworming of calves had no non-adopters in the participant group but had six per cent of partial adopters. This practice had maximum number of partial adopters (76 per cent) in the non-participant group, and included six per cent non-adopters also. This highlights the point that the participants may have understood the importance of timely deworming of calves though this distance education media.

The practice of artificial insemination of animals had only eight per cent partial adopters among the participant group and had no non-adopters. This result is in disagreement with the finding of Khan (1980). Approximately half the number of non-participants were partial adopters of this practice, and there were 24 per cent non-adopters of this practice among the non-adopter group. Reasons for non-adoption are discussed later in this chapter.

Feeding commercial cattle feed was fully adopted by all the participants except eight per cent, who were partial adopters of the practice. This finding did not agree with the result of Balasubramoniam (1980) and Khan (1980). Of the total non-participants 14 per cent were non-adopters and 58 per cent partial adopters.of this practice. In this context it has to be relied upon that the participants had a better adoption behaviour to this practice having more acclimatised with the importance of feeding concentrates to the dairy cattle through the correspondence course.

Although there were no non-adopters in the participant group for the practice of preventive vaccination, more than fifty per cent of them were partial adopters of this practice. This result disagrees with the findings of Balasubramoniam (1980) and Khan (1980).

Approximately half of the total non-participants were partial adopters of this practice and 44 per cent were non-adopters. Much of the beliefs that prevented the farmers from adopting this practice were eliminated through the correspondence course, thereby provoking them to adopt this practice for the betterment of their economy.

Majority of the participants adopted the practice of early breeding but there were four per cent non-adopters and 22 per cent partial adopters for this practice. This finding agrees with the result given by Kakoty and Sharma (1986). Of the non-participants, 60 per cent were partial adopters of this practice and more than one-fourth were non-adopters. The reasons and interpretation for partial and non-adoption behaviour expressed for this practice is discussed, later in this chapter.

Full hand milking practice was not practically adopted by 32 per cent of the participants and of the remaining who practised it 30 per cent were partial adopters. Almost all (98 per cent) non-participants were non-adopters of this practice and only 2 per cent were partial adopters.

An interesting finding is about the practice of washing the udder with mild antiseptics after milking which is a step towards clean milk production. Only six per cent of the participants adopted this practice whereas a lion's share (80 per cent) were non-adopters and the remaining partial adopters. This finding stood in contradiction to the finding of Balasubramoniam (1980). This practice was the only one which was not adopted by any of the non-participants. This may be due to the fact that importance of the practice of washing udder with mild antiseptics was transferred to the participants through the correspondence lessons. The non-participants who had not undergone the course, thus, were totally unaware of this practice as a whole.

This study revealed that of the ten socio-psychological and economic characteristics of the participants studied only two attributes viz., economic motivation and scientific orientation were significantly influencing the practise adoption behaviour, when the multiple linear regression was fitted. The combined effect of these ten variables explained 79 per cent of the variations in the adoption score. The regression co-efficients of only economic motivation and scientific orientation were significant while those of the remaining eight attributes were non-significant. This was also substantiated by the chi-square analysis and the correlation analysis. The analyses had therefore, revealed consistently the vital role of these two variables, economic motivation

and scientific orientation, on the extent of adoption of improved dairy practices.

Of these two significant attributes, the scientific orientation of the participants emerged to be the most outstanding character that influenced practise adoption when path analysis was done. Scientific orientation had a direct effect of 0.5572 and it indirectly influenced the extent of practise adoption, practically through all the other independent variables. This finding is, in agreement with that of Supe (1969), Subramaniam (1976), Saini et al. (1977) and Somasekharan (1980) but did not agree with the finding of Sinha et al. (1976). Scientific orientation had maximum substantial indirect effect on adoption through economic motivation followed by cosmopoliteness. This finding reveals that the participants who were more scientifically inclined were better adopters. This variable should be hence exploited along with the economic motivation to obtain a better adoption level. For this the participants should be kept in touch with research findings of the KAU, regarding improved dairy practices. This can be done by sending leaflets or bulletins along with the lessons of correspondence course, which should contain the latest research findings, simplified to their level of understanding. Provision for feedback should also be arranged. Once the feedback is obtained, the doubts regarding various practices could be solved by resortin to appropriate methods.

Economic motivation was found to have a direct effect of 0.4328 and maximum substantial indirect effect through scientific orientation on the extent of practise adoption. This finding of positive and significant relationship between economic motivation and extent of practise adoption was in consonance with the findings of Supe (1969), Das and Sarkar (1970), Singh and Singh (1984), Vijayaraghavan (1977), Tyagi and Sohal (1984) and Kologi and Usha (1985) but disagreed with the findings of Subramanian (1976) and Somasekharan (1980)). This result substantiate the fact that participants were more prone to the economic aspects of dairying. Most of the participants wanted more yield for the betterment of their financial status. Hence initiations can be done by the KAU for promoting the dairy farmers with small units of herd to larger number of herds so that dairying can be changed to a promising enterprise. Areas of accessory profits from dairying other than milk should be emphasized, especially the fuel economy in using biogas plants. Since the participants are more towards scientific adherence of practices, effective channelling of research findings for a rewarding enterprise should be the motto while formulating and transferring the lessons of the correspondence course in dairying. It is highly essential to have lessons on the economics of dairying which will give a clear picture to the participant regarding the financial benefits that can be accrued as a result of dairying. Age was not found to have any influence on the practise adoption. This may be due to the reason that age

was not a criteria for the participants' selection to the correspondence course. The participants belonged to different age groups. Studies conducted by Jothiraj (1974), Vellapandian (1974), Sinha (1976), Saini et al. (1977), Bhaskaran (1978), Subhadra (1979), Somasekharan (1980), Kukoty (1986) and Natarajan (1986) confirm this finding. But this finding disagreed with the result of Subramanian (1976), Balasubramaniam (1980) and Kologi (1985) who had found that age was negatively and significantly correlated to adoption and that of Vijayaraghavan (1977) and Titus (1981) who observed positive and significant relationship between age and adoption.

Majority of the participants had high school education. Education was not found to have any influence in the adoption of practices. This may be due to the reason that all the participants had enough level of education to understand and perceive ideas from the lessons of the correspondence courses. Hence a differentiation based on the educational influence on adoption could not be sorted out. This result agreed with the findings of Sinha and Sohal (1970), Joon et al. (1970), Sharma and Nair (1974), Menon and Rao (1975), Sinha (1976), Saini et al. (1977), Bhaskaran (1978), Subhadra (1979) and Natarajan (1986). But the findings of Singh and Singh (1970), Jaiswal et al. (1971), Jha and Shatavat (1972), Subramanian and Lakshmana (1973), Vellapandian (1974), Subramanian (1976), Balasubramanian (1980), Katherkhan (1980), Natarajan (1980),

Somasekharan (1980), Godhandapuri (1985), Kologi (1985) and Kakoty and Sharma (1986), that education had a positive and significant relationship with the adoption, did not hold good with the result of this study.

Menon and Rao (1975), Subhadra (1979), Somasekharan (1980) concluded from their studies that annual income was not an attribute that would influence practise adoption. This study also revealed, in consonance with the above studies, that annual income was not a limiting or accelerating factor for practise adoption. But this finding did not agree with the finding of Hussain (1971), Perumal and Duraiswamy (1972), Chandralandan (1973), Anbalagan (1974), Oliver et al.(1975), Subramaniam (1975), Khaleel (1978), Balasubramanian (1980), Ravichandran (1980) and Kologi and Usha (1985), who found out a positive significant correlation of annual income with adoption.

Family size was not found to have any significant relationship with the practise adoption behaviour. This result agrees with the findings of Sinha et al. (1976) and Kakoty and Sharma (1986) but contradicted with the finding of Saini et al. who recorded a negative significant relationship of family size with adoption. By and large it can be said that family size seems to have no role in the adoption behaviour of participants.

The finding that herd size was not a determinant factor in influencing practise adoption agreed well with those

findings of Saini et al. (1977), Singh and Dubey (1978), Subhadra (1979), Balasubramaniam (1980), Natarajan (1980) and Kakoty and Sharma (1986). But this conclusion about the relationship did not agree with the results of Jothiraj (1974), Subramaniam (1976), Somasekharan (1980) and Kologi and Usha (1985) who stated that there existed a positive correlation between the herd size and practise adoption behaviour.

With regard to social participation, the interesting finding that emerged, revealed that majority of participants with high level of social participation were medium adopters and majority of the high adopters were having medium social participation. Evidently, there was no proof to account for the influence of social participation on practise adoption. This finding agrees with the results given by Menon and Rao (1975), Saini et al. (1977), Bhaskaran (1978) and Subhadra (1979). But this finding stood contradictory to those obtained by Joon et al. (1970), Das and Sarkar (1970), Saha (1973), Anbalagan (1974), Karim and Mahboob (1974), Vellapandian (1974), Sinha (1976), Prasad (1978), Rajendran (1978), Somasekharan (1980) and Kologi and Usha (1985). They found that social participation was having a positive and significant relationship with the extent of practise adoption.

In the study, on partial regression analysis, it was observed that risk preference of the participants did not influence the extent of practise adoption, which agrees with the finding obtained by Bhaskaran (1978) and Somasekharan (1980).

But this finding did not agree with neither the results obtained by Supe (1969), Jaiswal et al. (1971), Subramanian (1976), Rajendran (1978) and Kologi and Usha (1985) that risk preference had a positive and significant relationship with practise adoption behaviour nor with those obtained by Titus (1981) who stated a negative correlation of adoption of the new farm practices to the perceived risk. Although Jaiswal et al. (1971), Pushkaran (1975), Sinha et al.(1976) and Saini et al. (1977) obtained a significant relationship between the cosmopolite nature and the extent of adoption, such a relationship was not identified in this study. It was found that the attribute of cosmopoliteness was not having any significant influence over the extent of practise adoption, which very well agrees with the finding of Somasekharan (1980).

Of the eight practices studied, all the practices, except the practice of mild antiseptic washing of udder after milking and full hand milking, all other practices were found to have been symbolically adopted by all participants.

The practice of mild antiseptic washing of udder after milking was symbolically adopted by approximately three-fourth of the total participants. Majority were practise non-adopters. The reason for the mental non-cooperation with this practice was collected. It evidenced that the major lacunae which inhibited adoption of this practice was lack of time. Majority of the milkers wanted to finish off milking at the earliest. If they had to adopt the above

practice, more time had to be spent per milking cow which they considered was not worth the time. Although some participants adopted this practice in the beginning they discontinued the practice for lack of faith in the practice.

The problem with non-adoption of this practice can be overcome only by convincing the participants about the importance of hygienic milking. They can be motivated to adopt this practice by making them aware of the economic loss that they will be facing, if they do not adhere to this practice. This is more advisable in this context, for it has been evidently found in this study that the participants who had high economic motivation and scientific orientation were high in their practise adoption pattern. Steps have to be taken to make them aware of the scientific reasons behind such a practice and that the time that they spent for this practice would be worth. For this, the lessons in this area could be structured in a way that more stress is given to the economic loss the farmer would suffer if this practice is neglected. Moreover, the lessons can be simplified and substantiative reasons can be quoted for the necessity of adherence to this practice.

The practice of full hand milking was symbolically adopted by only 70 per cent participants. There were approximately equal number (30 per cent each) of partial adopters and non-adopters of this practice among the participants.

The symbolic non-adopters stated that it was a practice which consumed more time and was more strenuous in nature. The non-adopters had the belief that the quantity of milk obtained through this type of milking was less when compared to other types of milking. The partial adopters were those who changed the methods, during milking. They practised thumbing and stripping occasionally along with full hand milking.

Sincere efforts have to be taken to overcome this misunderstanding and to correct the traditional way of approach in milking. This can be done only be demonstration, wherein they can be convinced about the method and result of full hand milking. For this it would be advisable to provide facilities for one or two 'get together' of the participants wherein this type of practices can be demonstrated. This will aid in clearing off their misunderstandings regarding such a practice.

Practice of early breeding of animals, the practice that was symbolically adopted by all the participants had only 74 per cent full adopters.

The major reasons given by the participant partial adopters of this practice was the observance of late heat symptoms and lack of service facilities. The non-adopters were yet to practically adopt this practice for the fear on that part of possible reduction in milk yield, if bred within a few months after calving.

The practice of preventive vaccination was symbolically adopted by all the participants. Although the practice of preventive vaccination had no non-adopters, it was partially adopted by approximately half of the participants. Non-availability of the vaccines and lack of service personnels were the two reasons accounted by the partial adopters.

The practice of feeding commercial cattle feed was symbolically adopted by all the participants. There were 18 per cent participants who were partial adopters of the practice of feeding commercial cattle feed. Rest were full adopters of this practice. They gave the reasons of unavailability of quality feed, at reasonable price for this pattern of adoption.

The practice of artificial insemination was symbolically adopted by all the participants. This practice was partially adopted by 8 per cent of the participants, whereas all the others fully adopted this practice. The reasons attributed by the participants for this partial adoption was the unavailability of service facilities.

The practice of timely deworming of calves was symbolically adopted by all the participants. Majority of the participants fully adopted the practice of timely deworming of calves whereas six per cent adopted it partially. The reasons attributed by the participants for the partial adoption included unavailability of service personnels and lack of facilities.

It is highly satisfying to note that the practice of colostrum feeding to calves in the initial days was identified by the farmers with due gravity and all the participants symbolically and practically fully adopted this practice.

The concept of 'system blame' rather than 'person blame' seems to contribute to the situation drawn out from the study. The lacunae of the existing gap between the symbolic adoption and practise adoption of certain practices point towards some deficiency of a sound system of technology transfer. Although all the blame for the non-adoption of practices could not be attributed to 'an improper system', the contribution of such a defect on adoption cannot be neglected.

The reasons for practise non-adoption like the unavailability of the vaccines, lack of service personnel, unavailability of quality feed at reasonable price and lack of facilities can be rightly clustered under the 'system blame'. For no reason of fault of theirs, the farmers are being guided towards non-adoption. The constraints narrated by the farmers like the more time required for milking, strenuous nature of full hand milking and more time consumption for antiseptic washing can be grouped under 'person blame'. 'Lack of faith' in a particular practice reveals the inability of failure on the part of the system in convincing the respondents of the value of the practice.

Hence it is high time that an effort, at least if not a remedial effort, should be taken up by the organisation/

institution concerned to see that the system does not find a loophole to be criticised. For this the results of evaluations of various programmes, should be analysed and moduled so that they are forceful in evoking solid reasonable feedback on which the future programmes can be structured. The KAU can point out the foresaid 'system defects' to the concerned authorities for better understanding of the situation and implementation of future programmes.

Roling (1984) has stated that novel ideas or practices tend to be diffused among those who think they can benefit from them and who have both the knowledge and the means to apply them. This idea has to be exploited for an effective remedy of the present crisis of person blame. For this, they have to be convinced of the importance of various improved dairy practice. Naturally the messages through mass media like correspondence course can contribute only in the awareness stage of the diffusion process. The interest and evaluation stages that lead the farmer towards adoption are ignored by negligence of a proper follow up and reinforcement of the idea. It is highly essential to have specialised media (extension advisers) and individual media (neighbours, peer opinion leaders) for provoking the farmers towards a decision. The role of these two media has to be emphasized, for an effective resurrection from the cause of 'person blame'. In a State like Kerala, where literacy stands high, even the print media can be used to an extent for creating interest,

but this cannot be totally relied upon. Hence it is advisable to have regular 'contact classes' for groups of farmers, as a follow up of the correspondence course. These contact classes can be organized by the KAU with the supporting hand of intermediate organisations.

Roling (1934) defines intermediate organizations as a non-governmental one but which is by no means impossible for a government agency to be involved. The function of such an organisation is to mobilize small farmers within homogenous target categories into small groups which can act as effective utilizer system and as platforms for counteracting explorative forms. It can mobilize the agency level through such devices as seminars at the field level, in such top administrators and officials are brought together with small farmers.

The recognition of farmer's participation in the programme is necessary for the programme to bear fruitful results. This can be only done by contact classes which call in for a group approach and thereby an intimate association of the organizers with the participants.

The study revealed that economic motivation and scientific orientation bore highly significant relationship with the practise adoption. Hence the importance of these two independent variables should be emphasized while formulating messages for communication to the farmers. The economic repercussions of a particular practice should be duly informed

to the participant and his curiosity should be aroused by specifying scientific reasons for the necessity of adoption of the practice. This curiosity arousal can be done by better illustrations and interesting informations which can trigger off their craving for better knowledge, which will result in enduring change in behaviour, which is relatively permanent.

A model narrating the role of correspondence course in knowledge utilization and adoption process suggested by the investigator based on the model given by Roling (1984) is given in the Figure 17 .

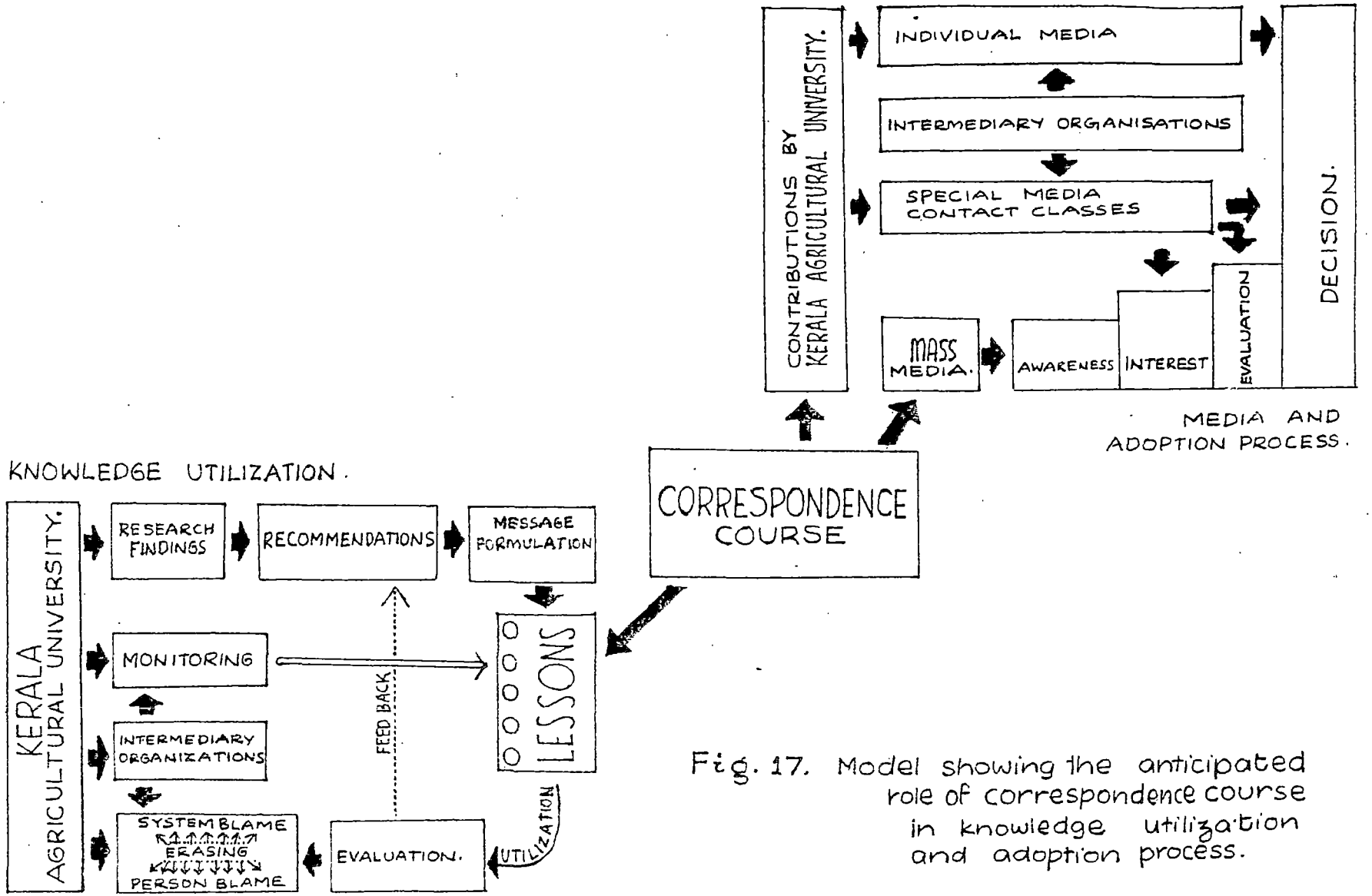


Fig. 17. Model showing the anticipated role of correspondence course in knowledge utilization and adoption process.

Summary

SUMMARY

Dairying is an important enterprise in so far as its potency and prospects in Kerala are concerned. An up-to-date knowledge on the various scientific dairy husbandry practices is necessary for the farmers to ensure an economic return from their animal.

Various methods are adopted by the Kerala Agricultural University for the transfer of these techniques to the farmers. Of these, one was the correspondence course in dairying conducted for the dairy farmers in 1983-84. This study was undertaken to judge the impact of correspondence course in dairying. The impact was measured by comparing the knowledge, attitude, symbolic adoption and practise adoption levels of the farmers who were participants of this correspondence course, with non-participants of the correspondence course.

The study had the following specific objectives:

1. To find out the level of knowledge of the participants and non-participants of this correspondence course about improved dairy practices.
2. To measure the attitude of the participants and non-participants towards improved dairy management practices.
3. To measure the symbolic adoption of the improved dairy management practices by the participants and non-participants.

4. To assess the adoption behaviour of the participants and non-participants of the correspondence course in relation to the improved dairy management practices.

5. To investigate the association, if any, between the socio-psychological and economic factors of participants and extent of adoption practices by them.

6. To probe into the reasons for non-adoption of the improved dairy practices.

The results of the study may help in assessing the worth of this distance education method, which can help the KAU in designing strategies for streamlining the future correspondence courses that are to be organised.

The study was conducted on randomly selected 50 participants of the correspondence course scattered all over Kerala and 50 non-participants, selected on a matched pair basis.

The knowledge of the participants and non-participants was measured using a knowledge test set framed as suggested by Anasthasi (1961).

The attitude of the participants and non-participants towards improved dairy management practices was measured using an attitude scale developed for this study, following the 'scale product method' which combines the Thurstones' techniques of equal appearing interval and Likerts technique of summated rating as proposed by Eysenck and Crown (1949). The scale had ten items which helped in determining one's

strength of attitude towards various dairy management practices.

Eight practices, from 24 lessons of the correspondence course were selected as improved dairy practices.

The symbolic adoption of the participants and non-participants was measured by symbolic adoption index.

The practise adoption was measured using the adoption index developed by Sengupta (1967) and modified by Jothiraj (1974).

The knowledge, attitude and practise adoption levels were categorised into low, medium and high using the standard techniques based on their scores. Symbolic adoption level was categorised into the low and high groups based on their scores.

The ten socio-psychological and economic variables studied in relation to the extent of adoption were age, education, annual income, family size, herd size, social participation, economic motivation, scientific orientation, risk preference and cosmopoliteness.

Simple analyses were made using percentage analysis. Chi-square test was used to test the significance of the association between the dependent and independent variables. Multiple regression, correlation and path analysis were done to assess the influence of the various characteristics on adoption behaviour. The salient findings of the study are

1. The mean knowledge scores of the participants and non-participants were 84 and 40.25 respectively.

2. Half of the total participants (50 per cent) possessed medium knowledge level about improved dairy practices whereas majority of the non-participants(98 per cent) were having a low knowledge level.

3. The mean attitude scores of the participants and non-participants were 205.48 and 173.6 respectively.

4. Majority of the participants (74 per cent) had a favourable attitude towards the improved dairy management practices whereas majority of the non-participants (68 per cent) possessed a less favourable attitude.

5. The mean symbolic adoption indices of the participants and non-participants were 96.08 and 73 respectively.

6. Majority of the participants (74 per cent) were high symbolic adopters of the improved dairy management practices whereas majority of the non-participants were low symbolic adopters.

7. The mean practise adoption indices of the participants and non-participants were 76.12 and 41.38 respectively.

8. Majority of the participants were medium practise adoptors (60 per cent) of the selected dairy husbandry practices whereas a majority of the non-participants (93 per cent) were low practise adopters.

9. The practice of the feeding colostrum to calves was fully adopted by all the participants.

10. The practice of deworming of calves was fully adopted by 94 per cent of the participants and the remaining six per cent were partial adopters of the practice. Unavailability of the service personnel was the reason for the non-adoption.

11. The practice of artificial insemination of animals was fully adopted by 92 per cent participants and partially adopted by the rest eight per cent. Lack of service facility was the reason given for non-adoption.

12. The practice of feeding commercial cattle feed to animals was adopted to the full extent by 82 per cent and was partially adopted by 18 per cent. Unavailability of quality feed at reasonable price was the major reason for the non-adoption of this practice.

13. Although none was non-adopters of the practice of preventive vaccination to animals, 52 per cent of the participants were partial adopters of the practice and only remaining 48 per cent fully adopted it. Non-availability of the vaccines and lack of service personnels were the reasons attributed to partial adoption.

14. The practice of early breeding of animals were fully adopted by 74 per cent participants, partially adopted by 22 per cent and non-adopters constituted four per cent.

Observance of late heat symptoms and lack of service facilities were the reasons for not fully adopting early breeding practice.

15. The practice of full hand milking was not adopted by 32 per cent participants whereas 38 per cent fully adopted it and the remaining 30 per cent partially adopted it. More time consumption and strenuous nature of the practice were the reasons for non-adoption.

16. The practice of mild antiseptic washing of udder after milking was not adopted by a majority (80 per cent) of the participants. Only six per cent adopted it fully and the remaining 14 per cent partially adopted the practice. Lack of time was given as the reason for non-adoption.

17. Economic motivation, scientific orientation and risk preference of the participants were found to have a positive and significant correlation with the extent of adoption of improved dairy practices. Family size was found to have negative and significant correlation with the extent of adoption. Other independent variables were not having any significant correlation with extent of adoption.

18. Economic motivation and scientific orientation of the participants were found to have maximum direct and indirect effects on the extent of practise adoption of improved dairy practices.

References

REFERENCES

*Anasthasi, Anne (1961). Psychological Testing. Second edition. The Macmillan Company, New York, 657.

Anbalagan, S. (1974). A study of factors influencing adoption of package of practices for high yielding varieties of paddy. M.Sc. (Ag) Thesis (unpublished). Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Ambastha, C.K. (1986). Communication Patterns in Innovation Development, Extension and Client Systems (A systems approach). B.R. Publishing Corporation, Delhi.

Balasubramanian, R. (1980). Adoption of dairy innovations - a critical analysis. Unpublished M.Sc. Thesis. Tamil Nadu Agricultural University.

Behera, C. and Sahoo, M.S. (1975). Impact of national demonstration on adoption of agricultural practices. Indian J. Ext. Edn. 11(1&2): 32-35.

Bhaskaran, S. (1978). To study the impact of institutional credit and its influence in the behaviour of farmers in adopting high yielding varieties of paddy cultivation. M.Sc.(Ag) Thesis. Department of Agricultural Extension, Faculty of Agriculture, Kerala Agricultural University.

Chandrakandan, K. (1973). A study on farm practice attributes and socio-personal factors of farmers in relation to adoption of agricultural practices in Thanjavoor district, Tamil Nadu. M.Sc.(Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Chandrakandan, K. (1982). Effectiveness of farm broadcasts on listeners - affective cognitive and psychomotor behaviours. Ph.D. Thesis (unpublished), Tamil Nadu Agricultural University, Coimbatore.

Chandrakandan, K. and Subramanyan, V.S. (1975). Note on socio-personal factors of farmers in relation to adoption. Madras Agric. J., 62: (10-12): 885-887.

Contado, T.E. (1984). Developing an extension programme: the communication process in training the agricultural and rural development. FAO economic and social development series, 31: 101-109.

Cronbach, L.J. (1949). Essentials of Psychological Testing. Harper and Bros, New york.

Dahiya, V.S. and Usha Anand (1985). Attitude towards mini Dairies. Dairy Guide, 7(1): 17-19.

"Dairying India" (1985). Indian Dairy Science Association, New Delhi.

Das, K.K. and Sarkar, D.R. (1976). Economic motivation and adoption of farm practices. Indian J. Extn. Edn. 6(1&2): 103-107.

Edwards, A.L. (1957). Techniques of attitude scale construction. Appleton Century Crofts.

*Edwards, A.L. and Kilpatrick, F.P. (1948). A technique for the construction of attitude scales. J. appl. Psychol. 32: 371-384.

*Eysenck, H.J. and Crown, S. (1949). An experimental study in opinion attitude,methodology. Int. J. Opin. Attitude Res., 3: 47-86.

Gochandapani (1985). Knowledge and adoption of nutrient recommendations for irrigated groundnut. M.Sc. (Thesis). Tamil Nadu Agricultural University, Coimbatore.

Guilford, J.P. (1954). Psychological Methods. Tata McGraw Hill Pub. Co., Bombay.

Gupta, C.L. and Sohal, T.S. (1974). A scale to measure dairy farmers' attitude towards dairy farming. Indian J. Extn. Edn., 10(3&4): 76-78.

Gupta, S.K. (1982). Towards a framework for distance education in developing countries. J. Indian Edn., 8(2): 40-43.

Haque, Md. A. and Ray, G.L. (1983). Factors related to the adoption of recommended species of fish in composite fish culture, 14(1&2): 74-83.

Hazarika, P. and Usha Anand (1984). Adoption behaviours of the dairy farmers of Intensive Cattle Development Programme, Khetapara (Assam). Dairy Guide, 6(5): 46-53.

Hiravenkanagoudar, L.V., Chitambar, J.B. and Chaulery, D.K. (1984). Impact of national demonstration on participant and non-participant farmers. Indian J. Extn. Edn., 20(1&2): 76-78.

Hussain, M.M. (1971). A study on selected extension methods in relation to influence on 14 pac'age of practices of Trivandrum district. M.Sc. (Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Jha, P.N. and Shaktawat, G.S. (1972). Adoption behaviour of farmers towards Hybrid Bajra cultivation. Indian J. Extn. Edn., 8(1&2): 24-31.

Jaiswal, N.K., Singh, N.N. and Singh, B.N. (1971). A study of interactional association of selected farmers with innovations in farming. Indian J. Extn. Edn., 7(3&4): 110-116.

Jalihal, K.A., Channagowda, M.B. and Sundaraswamy, B. (1976). A scale to measure farmers attitude towards HY varieties of paddy. Indian J. Extn. Edn., 11(3&4): 48-49.

Joon, B.S., Jagadish Singh and Rana, D.P. (1970). Response of farmers towards high yielding varieties. Indian J. Extn. Edn., 6(3&4): 58-62.

Jothiraj, S. (1974). An Ex-Post-Facto study on the extent of adoption of selected husbandry practices by dairyman. M.Sc. (Ag) Thesis. Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Kakoty, H.N. and Sharma, P.N. (1986). Characteristics associated with adoption of dairy production innovations. Dairy Guide, 8(3): 12-14.

Kamarudeen, M. (1981). A study on the impact of National Demonstration Programme on paddy cultivation in Trichur District. Unpublished M.Sc. Thesis, College of Agriculture, Vellayani.

Karim, A.S. and Mahaboob, S.G. (1974). Relationship of selected characteristics of transplanted Aman Rice growers with their adoption of fertilizers in rural area in Bangladesh. Indian J. Extn. Edn., 10(1&2): 16-22.

Katherkhan, D. (1980). Study of awareness, attitude, aptitude and adoption of farmers towards cross-bred dairy animals. M.Sc. Thesis, Tamil Nadu Agricultural University, Coimbatore.

Kempthorne, O. (1957). An introduction to genetic statistics, New York. John Wiley and Sons, INC, London.

Khaleel, F.M.H. (1978). A study on the impact of Intensive Paddy Development Programme in Kerala. M.Sc.(Ag) Thesis. Department of Agricultural Extension, Faculty of Agriculture, Kerala Agricultural University.

Kher, A.O. and Jha, P.N. (1978). Factors associated with farmers attitude towards primary Agricultural Credit Societies of Gujarat. Indian J. Extn. Edn., 14(1&2): 23-29.

Kologi, S.D. and Usha Anand (1985). Adoption of dairying innovations among selected Tibetian Refugees of Karnataka. Dairy Guide, 7(6): 37-41.

Kaura, M.S. and Singh, Y.P. (1968). A scale to measure farmers attitude towards Artificial Insemination. Indian J. Extn. Edn., 4(3&4): 35-47.

Likert, R. (1932). A technique for the measurement of attitudes. Arch. Psychol., No.140.

Malik, B.S., Sohal, T.S. and Verma, O.S. (1980). Knowledge of dairy farmers associated with varying traits. Dairy Guide, 2(6): 17-20.

Marsh, C.P. and Coleman, A.C. (1955). The relation of farmer characteristics to use adoption of recommended farm practices. Rural Sociology, 20: 289-296.

Menon, K.R. and Rao, C.A. (1975). Farmers characteristics in relation to adoption of improved agricultural practices through National Demonstration. Madras Agric. J., 62(10-12): 860-861.

Moulik, T.K. (1965). A study of the predictive values of some factors of adoption in nitrogenous fertilizers and influence of source of information on adoption behaviour. Unpublished Ph.D. Thesis. Indian Agricultural Research Institute, New Delhi.

Nair Thiagarajan, G. (1969). A multi-variate study on adoption of High Yielding Varieties by the farmers of Kerala State. Ph.D. Thesis, IARI, New Delhi.

Nataraju, M.S. and Channagowda, M.B. (1985). A comparative study of knowledge and adoption behaviour of small farmers, marginal farmers and agricultural labourers. Dairy Guide, 7(12): 31-41.

Nataraju, M.S. and Channagowda, M.B. (1986a). Some aspects about adopters of dairy innovation. Dairy Guide, 8(2): 41-51.

Nataraju, M.S. and Channagowda, M.B. (1986b). Knowledge level of dairy farmers and their personal characteristics. Indian J. Extn. Edn., 12(1&2): 47-55.

*Noll, V.H. (1957). Introduction of Educational Measurement Boston, Haughton Mufflin Company, 274-284.

Oliver, J., Duraiswamy, K.N. and Menon, R. (1975). Socio-economic factors and adoption through News articles. Madras Agric. J., 62(10-12): 850-859.

Pathak, S., Pal, M.K. and Guha, M.K. (1979). Impact of National Demonstration on knowledge, attitude and adoption level of farmers in West Bengal. Indian J. Extn. Edn., 15(1&2): 49-54.

Perumal, C. and Duraiswamy (1972). Differential characteristics of adopters and nonadopters of farm planning. Indian J. Extn. Edn., 8(1&2): 96-102.

Philip, S. (1981). Study on the agricultural information support provided through radio to farmers by Kerala Agricultural University. M.Sc. (Ag) Thesis, Department of Agricultural Extension, College of Agriculture, Vellayani.

Pillai, K.G.S. (1978). A study on the swine farming and pork consumption. M.Sc.(Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Prasad, R.M. (1978). A study on farmers functional literacy programme. M.Sc.(Ag) Thesis. Department of Agricultural Extension, Faculty of Agriculture, Kerala Agricultural University.

Pushkaran, P.S. (1975). A study on preferential choice of information sources by poultry farmers. M.Sc.(Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Rahiman, O.A. and Menon, A.G.G. (1978). The correspondence course for farmers on paddy cultivation. Indian J. Extn. Edn., 15(3&4): 58-61.

Rajendran, P. (1978). A study of factors affecting the adoption of selected agricultural practices. M.Sc.(Ag) Thesis, Department of Agriculture, Kerala Agricultural University.

Raju, V. (1981). Role of Financial Assistance and Incentives in Farmer Motivations in Dairying. M.V.Sc. Thesis, Faculty of Veterinary and Animal Sciences, Kerala Agricultural University.

Ravichandran, V. (1980). A study on attitude, extent of adoption and problems encountered by registered sugarcane growers. M.Sc. Thesis, Department of Agricultural Extension,and Rural Sociology, Tamil Nadu Agricultural University, Coimbatore.

Reddy Sudharsa, M. and Reddy, S.V. (1977). Personal socio-economic characteristics associated with attitude of farmers towards crop loan system. Indian J. Extn. Edn., 13(3&4): 68-70.

Report of the Education Commission (1964-1966). Education and National Development. Ministry of Education, Government of India: 435.

Rogers, E.M. and Shoemaker, F.F. (1971). Communication of Innovations. A cross cultural approach, New York Press.

Roling, N. (1984). Appropriate opportunities as well as appropriate Technology. Cases. FAO Review on Agriculture and Development, 17(1): 15-19.

Saha, K.K. (1973). Adoption problems of small farmers. Kurukshetra. 20(21): 10.

Saini, S.P.S., Shukla, A.N. and Khurana, G.S. (1977). Attributes of potential adopters of recommended dairy production innovations. Indian J. Extn. Edn., 13(3&4): 56-58.

Salunkhe, V.G. (1978). A scale to measure small farmers attitude towards SFDA. Indian J. Extn. Edn., 14(1&2):66-69.

Sawant, G.K. and Dhole, P.T. (1978). Extent of adoption of cross-breeding in cattle by dairy farmers and problems faced by them in Ahamed Nagar District, Maharashtra. Indian Dairyman, 30(12): 825-828.

Sayadi, A.G. and Sehal, T.S. (1984). Attitude of dairy farmers towards scientific activities in Jarru district. Dairy Guide, 6(9): 39-43.

Sengupta, T. (1967). A simple adoption scale for selection of farmers for high yielding varieties programme on rice. Indian J. Extn. Edn., 3(3): 107-115.

Sankariah, C. and Singh, K.N. (1967). Predictive analysis of factors associated with knowledge of improved practices of vegetable cultivation. Indian J. Extn. Edn., 31(1-2):

Sharma, S.K. and Nair, G.T. (1974). A multi-variable study of adoption of high yielding varieties of paddy. Indian J. Extn. Edn., 10(1&2): 30-35.

Singh, R.K. and Chaudhary, B.D. (1985). Biometrial methods in quantitative genetics analysis. 3rd ed., Kalyani Publishers, New Delhi, pp. 70-78.

Singh, S. and Dubey, V.K. (1978). Adoption of scientific feeding practices by cattle owners of the Intensive Cattle Development Programme, Karnal. Indian J. Extn. Edn., 15(1&2): 70-72.

Singh, B., Mahipal, and Tyagi, K.C. (1985). Some selected socio-personal economic characteristics of the farmers of progressive and non-progressive dairy villages. Indian J. Extn. Edn., 21(3&4): 101-103.

Singh, K.N. and Prasad, R. (1974). Communication behaviour and source credibility perception of young farmers. Indian J. Extn. Edn., 10(1&2): 53-56.

Singh, K.M.P. and Singh, S.P. (1974). Impact of National Demonstration in the adoption of high yielding varieties of wheat. Indian J. Extn. Edn., 10(1&2): 65-74.

Singh, S.N. and Singh, K.N. (1970). A multi-variable analysis of adoption behaviour of farmers. Indian J. Extn. Edn., 6(3&4): 39-44.

Singh, J.N., Sinha, B.P. and Verma, A.K. (1979). Factors affecting adoption of Artificial Insemination in cows. Indian J. Extn. Edn., 15(1&2): 55-62.

Sinha, Sinha, P.R.R. and Sohal, T.S. (1976). Attributes of potential adopters of cattle feed mixture. Indian J. Extn. Edn., 12(3&4): 46-47.

Sinha, H.S.P. and Sinha, S.K. (1980). Adoption of high yielding varieties of maize by the farmers of Sikkim. Indian J. Extn. Edn., 16(1&2): 46-50.

Snedecor, G.W. and Cochran, W.G. (1967). Statistical Methods. 6th ed., Oxford and IBH Publishing Co., New Delhi. pp. 391-406.

Sohal, T.S. and Tyagi, K.C. (1978). Role of knowledge in adoption of dairy innovations. Indian J. Extn. Edn., 14(3&4): 16-25.

Sohi, J.S. and Kherde, R.L. (1980). A study of dairy adoption behaviour of small and marginal farmers in Punjab. Indian J. Extn. Edn., 16(1&2): 84-86.

Sohi, U.S. and Sandhu, A.S. (1976). Knowledge of village level workers about Agricultural Practices. Indian J. Extn. Edn., 12(3&4): 69-71.

Somasekharan, (1980). Factors influencing Adoption of selected Husbandry Practices by Milk Producers. M.V.Sc. Thesis. Department of Extension, Faculty of Veterinary and Animal Sciences, Kerala Agricultural University.

Subhadra, M.R. (1979). Comparative effectiveness of extension communication media used under the dairy development programme and extent of adoption of improved dairy husbandry practices by members of milk co-operatives in selected areas in Trichur Taluk. M.V.Sc. Thesis, Department of Extension, Faculty of Veterinary and Aniral Sciences, Kerala Agricultural University.

Subramanian, R. (1976). Factors influencing adoptions of poultry farming. M.Sc. (Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Subramonian, V.S. and Lakshmana, C. (1973). Impact of socio-economic factors on the adoption of improved farm practices. Madras Agric. J., 60(3): 187-191.

*Supe, S.V. (1969). Factors related to different degrees of rationality in decision making among farmers in Buldhara district. Ph.D. Thesis, Indian Agricultural Research Institute, New Delhi.

Surendran, P.U. and Pushkaran, P.S. (1977). "A Report of a Survey of outlook of the people of Trichur Taluk on Animal Husbandry", College of Veterinary and Animal Sciences, Kerala Agricultural University, KAU Press.

Thangavelu, A. (1979). A multi-dimensional study on farm credit of a Nationalised Bank. M.Sc.(Ag) Thesis (Unpub.), Tamil Nadu Agricultural University, Coimbatore.

Thurstone, L.L. and Chave, E.J. (1929). The Measurement of Attitude. Chicago University, Chicago Press.

Titus Ola Ogunfiditimi (1981). Adoption of improved farm practices: A choice under uncertainty. Indian J. Extn. Edn., 17(1&2): 30-35.

Trivedi, G. (1963). Measurement analysis of socio-economic status of rural families. Ph.D. Thesis, Indian Agricultural Research Institute, New Delhi.

Tyagi, K.C. and Sohal, T.S. (1984). Factors associated with adoption of dairy innovations. Indian J. Extn. Edn., 20(3&4): 1-8.

Vellapandian, C. (1974). A study on adoption and adopter categories of some improved agricultural practices. M.Sc.(Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Vijayaraghavan (1977). A study of factors affecting the knowledge and adoption of high yielding varieties of paddy by small and marginal farmers. M.Sc.(Ag) Thesis, Department of Agricultural Extension, Agricultural College and Research Institute, Coimbatore.

Vijayaragavan, K. and Subramanyam, V.S. (1980). Communication behaviour of garden land and dry land farmers. Indian J. Extn. Edn., 16(1&2): 77-81.

Wilkening, E.A. (1952). Informational leaders and innovators in farm practice. Rural Sociology, 17: 272-273.

* Originals not consulted

Appendices

Appendix I

Interview Schedule

Respondent No.

Part I

1. Name of the respondent :

2. Name of the Village :

3. Age (in years) :

4. Educational status : Middle School
High School
College educated

5. Land possessed : Upto 10 cents
Below 1 hectare (2.5 acres)
1-2 hectare (2.5-5 acres)
Above 2 hectare (5 acres)

6. Annual income from : 1. Dairy alone Rs.
2. From other sources Rs.
3. Total annual income Rs.

7. Members in the family :

	Male	Female	Total
Adult:			
Children:			
Total			

8. Livestock owned:

Species	Category	Crossbred	Local	Total
Buffalo	1. Milch			
	2. Dry			
	3. Youngstock			
Cows	1. Milch			
	2. Dry			
	3. Youngstock			

9. Social participation :

9.1. Are you a member/office bearer in any organisation : Yes/No

If yes, name the organisation

9.2. How often d/did

You attend the meetings of the above institution: Regularly (R)

Occasionally (O)

10. Economic motivation	Strongly agree	Agree	undecided	Disagree	Strongly disagree
10(1) A dairy farmer should work towards larger yields and economic profit	( )	( )	( )	( )	( )
10.2. The most successful dairy farmer is the one who makes the most profit	( )	( )	( )	( )	( )
10.3. A dairy farmer should try any new dairying idea which may earn more money	( )	( )	( )	( )	( )
10.4. A dairy farmer should go for cattle raising with longer herds and increased monetary profit rather than rearing one or two cows	( )	( )	( )	( )	( )
10.5. It is difficult for the dairy farmers children to make good start unless he provides them with economic assistance	( )	( )	( )	( )	( )
10.6. A farmer must earn his living but most important thing in life cannot be defined on the basis of economic status	( )	( )	( )	( )	( )

11. Scientific orientation

11.1. Improved animal husbandry practices give better results to a dairy farmer than old methods

11.2. Even a dairy farmer with lots of experience should use new methods of animal husbandry

11.3. Though it takes time for a farmer to learn new methods in animal husbandry it is worth the efforts

11.4. A good dairy farmer experiments on with new ideas in animal husbandry

11.5. Traditional methods of animal husbandry have to be changed in order to raise the level of living of dairy farmers

11.6. The way a dairy farmers fore-father farmed is still the best way to rear animals today

12. Risk preference

12.1. A dairy farmer should rather take more chance in making a big profit than to be content with a smaller but less risky profit

12.2. A dairy farmer who is willing to take greater risk than the average farmer, usually do better financially

12.3. It is good for a dairy farmer to take risk when he knows his chance of success is fairly high

12.4. Trying entirely new method in animal husbandry by a dairy farmer involve risk, but, it is worth it

12.5. A dairy farmer should rear large number of animals to avoid greater risks involved in dealing one or two animals

12.6. It is better for dairy farmer not to try new dairying methods unless most others have used them

13. Cosmopolite/localite

13.1. A person who has experienced something worth in his village need not worry about recurring additional information from sources outside his village

13.2. One can satisfy all his requirements out of local resources available to him

13.3. Many things a person ought to know, are happening outside his village and such things will be of great advantage to a person, therefore ought to know them

13.4. At present, when transport and other communications facilities are developing, a villager should know more about things happening outside his village

Part II

Twelve statements are given below. Please indicate your degree of agreement towards the statement.

Statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. It is not compulsory to feed the calf with colostrum					
2. In large farms, for identification of calves, branding or tattoing should be done					
3. Diseased calves need not be separated from healthy ones					
4. Deworming is not a necessary management practice in the calf-hood stage.					

Statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
5. Artificial insemination is a good breeding practice					
6. Milk yield of dairy animals can be increased through scientific feeding					
7. Once conceived artificially cow does not conceive by natural service					
8. Once the milk is let down, milking should be done as quickly as possible					
9. If strict hygienic measures are followed, mastitis can be controlled					
10. It is unnecessary to seek the help of a Veterinarian in the initial stages of a disease affecting the cow.					

Part III

Please answer the following questions:

1. Name the exotic breeds of bulls used in Kerala for crossbreeding

2. Once the signs of heat begins which is the best time for artificial insemination?

3. Which is the exotic breed having the highest milk fat content?

4. What is the approximate percentage of fat content in cows milk?

5. What is pasteurization?

6. What is the approximate quantity of concentrates that has to be given to a cross-bred cow giving 10 litres of milk per day

7. Name two diseases of cattle against which vaccinations are available.

8. What is the importance of colostrum feeding?

Part IV

Eight management practices are given below. Indicate whether you are mentally willing to accept these practices.

	Symbolic adoption	
	Yes	No
1. Artificial insemination of animals		
2. Feeding commercial cattle feed to cattle		
3. Feeding calf with colostrum in the initial days		
4. Breeding dairy animals in the first heat occurring within three months after calving		
5. Vaccination of animals against diseases		
6. Washing the udder with mild antiseptics after milking		
7. Full-hand milking of cows		
8. Deworming the calves within one month of calving		

Part V

Eight management practices are given below. Indicate the degree of adoption (full, partial or non-adoption) and reasons for non-adoption

	Practise adoption			
	Full adoption	Partial adoption	Non-adoption	Reasons for nonadoption
1. Do you artificially inseminate your animals?				
2. Do you feed your cattle with commercial cattle feed?				
3. Do you feed your calf with colostrum in the initial days?				
4. Do you breed your dairy animals in the first heat occurring within 3 months after calving?				
5. Do you get your animals vaccinated against diseases				
6. Do you wash the udder with mild antiseptics after milking?				
7. Do you resort to full-hand milking?				
8. Do you deworm the calves within one month of calving?				

Appendix II

KERALA AGRICULTURAL UNIVERSITY

Dr. P.S. Pushkaran,
Prof. & Head,
Department of Extension.

College of Veterinary & Animal Sciences,
Mannuthy.

Dated: 19-9-1986

Dear Dr./Shri/Smt.

Dr. Ramkumar, S.,M.V.Sc. student in Veterinary Extension is working on his MVSc thesis problem entitled "Impact of correspondence course on dairying on adoption of improved dairy management practices", under my guidance. As part of his research study, an attitude scale has to be developed to measure the attitude of the farmers who were participants of the correspondence course on dairying, towards improved dairy management practices. I have the pleasure to request you to please serve as a judge for standardisation of the attitude scale. I am enclosing a list containing thirty-three attitude statements and request you to please indicate your perception of the degree of favourableness/unfavourableness of each of the statements towards the improved management practices.

Statements that seem to express the most unfavourable feelings about the dairy management practices are to be placed in column (1). The statement that seem to express the most favourable feelings about the management practices are to be placed in column (9). The neutral column (5) is where statements which express neither favourable nor unfavourable feelings about the management practices are to be placed. Varying degrees of increasing favourableness are expressed by columns 6 and 9 and varying degrees of increasing unfavourableness by 4 to 1.

I once again reiterate that we are interested to study not your own attitude towards the improved dairy management but your perception of the degree of favourableness/unfavourableness expressed by each of the statements. The level of agreement may be indicated by a tick mark ( ) in the respective column against each statement.

I request you to kindly fill in the columns and return the proforma at your earliest convenience. I solicit your kind help in this regard.

Yours sincerely,

Sd/-
(Dr.P.S. PUSHKARAN)

Statement	Most unfavourable 1	More unfavourable 2	Favourable 3	Slightly unfavourable 4	Neutral column 5	Slightly favourable 6	Favourable 7	More favourable 8	Most favourable 9
1. It is not compulsory to feed the calf with colostrum									
2. Colostrum can effectively be substituted by milk replacer									
3. Disbudding is an essential management practice									
4. In large farms, for identification of calves, branding or tattooing should be done									
5. Calves not used for breeding need not be castrated									
6. Deworming is not a necessary management practice in the calf-hood stage									
7. Deworming should be done only when the cows are infested with worms									
8. Diseased calves need not be separated from healthy ones									
9. Artificial insemination is a good breeding practice									
10. Once conceived artificially cow does not conceive by natural service									
11. Animal in the dry period can be neglected in matters of their feed									
12. Milk yield of dairy animals can be increased through									

	1	2	3	4	5	6	7	8	9
13. Milching animals do not necessarily need green fodder to their fill									
14. Commercial cattle feed contains all the essential nutrients for the cow									
15. After calving, the cow need not be necessarily inseminated within 90 days									
16. Fodder cultivation along with dairying is not economical									
17. Pregnant cows should be given additional feed									
18. Lack of green fodder in the diet can cause infertility in cows									
19. The productivity of animal is dependent on the body growth									
20. Vaccination necessarily reduces milk yield									
21. Vaccination against contagious diseases in milch animals is not regularly needed									
22. It is good to keep the animals loose in an enclosure									
23. Cross bred cows are not better than buffaloes in milk production									
24. Ketosis can be prevented by scientific feeding in the pregnancy stage									

1 2 3 4 5 6 7 8 9

25. If after calving, the placenta does not fall within 12 hrs, essential to call for veterinary help

26. If strict hygienic measures are followed, mastitis can be controlled

27. Cows affected with mastitis can never return to its original production potential

28. Once the milk is let down, milking should be done as quickly as possible

29. Milking by full hand gives only less quantity of milk

30. Thumbing is the best way of milking

31. Pasteurisation kills all the pathogenic bacteria

32. Once the heat symptoms are shown, the cow should necessarily be inseminated within 12 hours

33. It is unnecessary to seek the help of a veterinarian in the initial stages of a disease affecting the cow

Appendix III

Statements selected to measure the attitude of the farmers towards improved dairy practices, with their scale value and Q values

Sl. No.	Statement	Scale value (S)	Q value
1	It is not compulsory to feed the calf with colostrum	1.01	0.51
2	In large farms, for identification of calves, branding or tattoing should be done	8.88	1.47
3	Diseased calves need not be separated from healthy ones	1.08	0.53
4	Deworming is not a necessary management practice in the calf-hood stage	1.09	0.56
5	Artificial insemination is a good breeding practice	8.89	1.26
6	Milk yield of dairy animals can be increased through scientific feeding	8.52	1.92
7	Once conceived artificially cow does not conceive by natural service	1.51	0.96
8	Once the milk is let down, milking should be done as quickly as possible	8.53	0.63
9	If strict hygienic measures are followed, mastitis can be controlled	8.52	1.48
10	It is unnecessary to seek the help of a veterinarian in the initial stages of a disease affecting the cow	1.50	1.73

IMPACT OF CORRESPONDENCE COURSE IN DAIRYING ON ADOPTION OF IMPROVED DAIRY PRACTICES

By

S. RAMKUMAR

ABSTRACT OF A THESIS

submitted in partial fulfilment of the
requirement for the degree

Master of Veterinary Science

Faculty of Veterinary and Animal Sciences
Kerala Agricultural University

Department of Extension
COLLEGE OF VETERINARY AND ANIMAL SCIENCES
Mannuthy - Trichur

1987

ABSTRACT

With a view to study the impact of correspondence course in dairying on adoption of improved dairy practices, the present study was conducted among 50 respondents scattered all over Kerala, out of the 285 participants and 50 non-participants selected on a matched pair basis.

The study aimed at measuring the knowledge, attitude, symbolic adoption, and practise adoption levels of the participants and non-participants with regard to improved dairy practices. The attitude of the respondents was measured using an attitude scale constructed for this purpose. Age, education, annual income, family size, herd size, social participation, economic motivation, scientific orientation, risk preference and cosmopoliteness were the independent variables studied in relation to the extent of adoption of the participants.

The study revealed that the mean scores obtained by the participants for knowledge, attitude, symbolic adoption and practise adoption were significantly higher than those obtained by non-participants.

Of the eight improved dairy practices, the practices of early breeding of animals, full hand milking and mild antiseptic washing of udder after milking had four per cent, 32 per cent and 60 per cent non-adopters respectively. There were no non-adopters for the other practices. Unavailability

of service personnels, lack of service facilities, unavailability of quality feed at reasonable price, non-availability of vaccines, strenuous nature of practices and more time consumption for adoption of practices were the major reasons attributed to partial and non-adoption of various practices.

Of the ten independent variables, only economic motivation, scientific orientation and risk preference of the participants were significantly and positively correlated to the extent of adoption of the participants whereas family size was negatively and significantly correlated to the extent of adoption of improved dairy practices. Economic motivation and scientific orientation of the participants had maximum direct and indirect effects on extent of practise adoption of improved dairy practices.